Appendix A

BDAR requirements compliance

Table A.1 Assessment of compliance with revised BDAR minimum information requirements

Revised BDAR section	BAM ref.	BAM requirement	Page reference(s) in the revised BDAR
Introduction	Sections 2 and 3	**Information**	
		Introduction to the biodiversity assessment including:	–
		☒ brief description of the proposal	Section 1.1
		☒ identification of subject land boundary, including: ☒ operational footprint ☒ construction footprint indicating clearing associated with temporary/ancillary construction facilities and infrastructure	Section 1.1.1
		☒ general description of the subject land	Section 1.2.5
		☒ sources of information used in the assessment, including reports and spatial data	Section 1.6
		☒ identification and justification for entering the BOS	Section 1.4
		Maps and tables	
		☒ Map of the subject land boundary showing the final proposal footprint, including the construction footprint for any clearing associated with temporary/ancillary construction facilities and infrastructure	Figure 15.1 Figure 15.2
Landscape	Sections 3.1 and 3.2, Appendix E	**Information**	
		Identification of site context components and landscape features, including:	–
		☒ general description of subject land topographic and hydrological setting, geology and soils	Section 3.2
		☒ per cent native vegetation cover in the assessment area (as described in BAM Section 3.2)	Section 3.3
		☒ IBRA bioregions and subregions (as described in BAM Subsection 3.1.3(2.))	Section 3.2.1

Revised BDAR section	BAM ref.	BAM requirement	Page reference(s) in the revised BDAR
		☒ rivers and streams classified according to stream order (as described in BAM Subsection 3.1.3(3.) and Appendix E)	Section 3.2.2
		☒ wetlands within, adjacent to and downstream of the site (as described in BAM Subsection 3.1.3(3.))	Section 3.2.2
		☒ connectivity of different areas of habitat (as described in BAM Subsection 3.1.3(5–6.))	Section 3.2.3
		☒ karst, caves, crevices, cliffs, rocks and other geological features of significance and for vegetation clearing proposals, soil hazard features (as described in BAM Subsections 3.1.3(7.) and 3.1.3(12.))	Section 3.2.4
		☒ areas of outstanding biodiversity value occurring on the subject land and assessment area (as described in BAM Subsection 3.1.3(8–9.))	Section 3.2.5
		☒ any additional landscape features identified in any SEARs for the proposal	Section 3.2.7
		☒ NSW (Mitchell) landscape on which the subject land occurs	Section 3.2.6
		☒ details of field reconnaissance undertaken to confirm the extent and condition of landscape features and native vegetation cover (as described in Operational Manual Stage 1 Section 2.4)	Section 2.1
		Maps and tables	
		☒ Site Map ☒ Property boundary ☒ Boundary of subject land ☒ Cadastre of subject land (including labelling of Lot and DP or section plan if relevant) ☒ Landscape features identified in BAM Subsection 3.1.3	Figure 15.1
		☒ Location Map ☒ Digital aerial photography at 1:1,000 scale or finer ☒ Boundary of subject land ☒ Assessment area (i.e. the subject land and either 1500 m buffer area or 500 m buffer for linear development)	Figure 15.2

Revised BDAR section	BAM ref.	BAM requirement	Page reference(s) in the revised BDAR
		☒ Landscape features identified in BAM Subsection 3.1.3 ☒ Additional detail (e.g. local government area boundaries) relevant at this scale	
		Landscape features identified in BAM Subsection 3.1.3 and to be shown on the Site Map and/or Location Map include:	–
		☒ IBRA bioregions and subregions	Figure 15.1 Figure 15.2
		☒ rivers, streams and estuaries	
		☒ wetlands and important wetlands	
		☒ connectivity of different areas of habitat	
		☒ karst, caves, crevices, cliffs, rocks and other geological features of significance and if required, soil hazard features	
		☐ areas of outstanding biodiversity value occurring on the subject land and assessment area	
		☒ any additional landscape features identified in any SEARs for the proposal	
		☒ NSW (Mitchell) landscape on which the subject land occurs	
		Data	
		☐ All report maps as separate jpeg files	To be submitted once revised BDAR is finalised
		Individual digital shape files of:	–
		☐ subject land boundary	To be submitted once revised BDAR is finalised
		☐ assessment area (i.e. subject land and 1500 m buffer area) boundary	To be submitted once revised BDAR is finalised

Revised BDAR section	BAM ref.	BAM requirement	Page reference(s) in the revised BDAR
		☐ cadastral boundary of subject land	To be submitted once revised BDAR is finalised
		☐ areas of native vegetation cover	To be submitted once revised BDAR is finalised
		☐ landscape features	To be submitted once revised BDAR is finalised
Native vegetation	Section 4, Appendix A and Appendix H	**Information**	
		☒ Identify native vegetation extent within the subject land, including cleared areas and evidence to support differences between mapped vegetation extent and aerial imagery (as described in BAM Section 4.1(1–3.) and Subsection 4.1.1)	Section 4.1 Figure 15.8 Appendix Q
		☒ Provide justification for all parts of the subject land that do not contain native vegetation (as described in BAM Subsection 4.1.2)	Section 4.1.2 Appendix Q
		☒ Review of existing information on native vegetation including references to previous vegetation maps of the subject land and assessment area (described in BAM Section 4.1(3.) and Subsection 4.1.1)	Section 2.2.1 Section 2.2.2
		☒ Describe the systematic field-based floristic vegetation survey undertaken in accordance with BAM Section 4.2	Section 2.2.3
		☒ Where relevant, describe the use of more appropriate local data, provide reasons that support the use of more appropriate local data and include the written confirmation from the decision-maker that they support the use of more appropriate local data (as described in BAM Subsection 1.4.2 and Appendix A)	Section 2.5.3

Revised BDAR section	BAM ref.	BAM requirement	Page reference(s) in the revised BDAR
		For each PCT within the subject land, describe:	–
		☒ PCT name and ID	Section 4.2 Figure 15.8
		☒ vegetation class	Section 4.2
		☒ extent (ha) within subject land	Section 4.2
		☒ evidence used to identify a PCT including any analyses undertaken, references/sources, existing vegetation maps (BAM Section 4.2(1–3.))	Section 2.2.3
		☒ plant species relied upon for identification of the PCT and relative abundance of each species	Section 4.2 Appendix D
		☒ if relevant, TEC status including evidence used to determine vegetation is the TEC (BAM Subsection 4.2.2(1–2.))	Section 4.3 Figure 15.8
		☒ estimate of per cent cleared value of PCT (BAM Subsection 4.2.1(5.))	Section 4.1
		Describe the vegetation integrity assessment of the subject land, including:	–
		☒ identification and mapping of vegetation zones (as described in BAM Subsection 4.3.1)	Section 4.4 Figure 15.11
		☒ description of vegetation zones within the subject land (as described in Operational Manual Stage 1 Table 2 and Subsection 3.3.2)	Section 4.4 Figure 15.11
		☒ area (ha) of each vegetation zone	Section 4.4
		☒ assessment of patch size (as described in BAM Subsection 4.3.2)	Section 4.4
		☒ survey effort (i.e. number of vegetation integrity survey plots) as described in BAM Subsection 4.3.4(1–2.)	Section 4.5.1

Revised BDAR section	BAM ref.	BAM requirement	Page reference(s) in the revised BDAR
		☒ use of relevant benchmark data from BioNet Vegetation Classification (as described in BAM Subsection 4.3.3(5.))	Section 4.5.1
		Where use of more appropriate local benchmark data is proposed (as described in BAM Subsection 1.4.2, BAM Subsection 4.3.3(5.) and BAM Appendix A):	–
		☒ identify the PCT or vegetation class for which local benchmark data will be applied	N/A
		☒ identify published sources of local benchmark data (if benchmarks obtained from published sources)	
		☒ describe methods of local benchmark data collection (if reference plots used to determine local benchmark data)	
		☒ provide justification for use of local data rather than BioNet Vegetation Classification benchmark values	N/A
		☒ provide written confirmation from the decision-maker that they support the use of local benchmark data	N/A
		Maps and tables	
		☒ Map of native vegetation extent within the subject land at scale not greater than 1:10,000 including identification of all areas of native vegetation including areas that are ground cover only, cleared areas (as described in BAM Section 4.1(1–3.)) and all parts of the subject land that do not contain native vegetation (BAM Subsection 4.1.2)	Figure 15.8
		☒ Map of PCTs within the subject land (as described in BAM Section 4.2(1.))	Figure 15.9
		☒ Map of vegetation zones within the subject land (as described in BAM Subsection 4.3.1)	Figure 15.11
		☒ Map the location of floristic vegetation survey plots and vegetation integrity survey plots relative to PCT boundaries	Figure 15.7
		☒ Map of TEC distribution on the subject land and table of TEC listing, status and area (ha)	Figure 15.10 Table 4.64
		☒ Map of patch size locations for each native vegetation zone and table of patch size areas (as described in BAM Subsection 4.3.2)	Figure 15.11 Section 4.2

Revised BDAR section	BAM ref.	BAM requirement	Page reference(s) in the revised BDAR
		Table of current vegetation integrity scores for each vegetation zone within the site and including:	–
		☒ composition condition score ☒ structure condition score ☒ function condition score ☒ presence of hollow bearing trees	Table 4.77
		Data	
		☐ All report maps as separate jpeg files	To be submitted once revised BDAR is finalised
		☒ Plot field data (MS Excel format)	Appendix D
		☒ Plot field datasheets	Appendix D
		Digital shape files of:	–
		☐ PCT boundaries within subject land	To be submitted once revised BDAR is finalised
		☐ TEC boundaries within subject land	To be submitted once revised BDAR is finalised
		☐ vegetation zone boundaries within subject land	To be submitted once revised BDAR is finalised

Revised BDAR section	BAM ref.	BAM requirement	Page reference(s) in the revised BDAR
		☐ floristic vegetation survey and vegetation integrity plot locations	To be submitted once revised BDAR is finalised
Threatened species	Section 5	**Information**	
		Identify ecosystem credit species likely to occur on the subject land, including:	–
		☒ list of ecosystem credit species derived from the BAM-C (as described in BAM Subsection 5.1.1 and Section 5.2(1.))	Section 12.2
		☒ justification and supporting evidence for exclusion of any ecosystem credit species based on geographic limitations, habitat constraints or vagrancy (as described in BAM Subsections 5.2.1 and 5.2.2)	Section 5.2
		☒ justification for addition of any ecosystem credit species to the list	Not applicable, no ecosystem credit species were added
		Identify species credit species likely to occur on the subject land, including:	–
		☒ list of species credit species derived from the BAM-C (as described in BAM Subsection 5.1.1)	Section 5.1.4
		☒ justification and supporting evidence for exclusions based on geographic limitations, habitat constraints or vagrancy (as described in BAM Subsections 5.2.1 and 5.2.2)	Section 5.2
		☒ justification and supporting evidence for exclusions based on degraded habitat constraints and/or microhabitats on which the species depends (as described in BAM Subsection 5.2.2)	Section 5.2
		☒ justification for addition of any species credit species to the list	

Revised BDAR section	BAM ref.	BAM requirement	Page reference(s) in the revised BDAR
		From the list of candidate species credit species, identify:	–
		☒ species assumed present within the subject land (if relevant) (as described in BAM Subsection 5.2.4(2. a.)) ☒ species present within the subject land on the basis of being identified on an important habitat map for a species (as described in BAM Subsection 5.2.4(2. d.)) ☒ species for which targeted surveys are to be completed to determine species presence (BAM Subsection 5.2.4(2. b.)) ☒ species for which an expert report is to be used to determine species presence (BAM Subsection 5.2.4(2. c.))	Section 5.2 Section 5.3 Section 5.4 Figure 15.12
		Present the outcomes of species credit species assessments from:	–
		☒ threatened species survey (as described in BAM Section 5.2.4)	Section 5.4 Figure 15.12
		☒ expert reports (if relevant) including justification for presence of the species and information used to make this determination (as described in BAM Subsection 5.2.4, Section 5.3, Box 3)	Appendix I
		Where survey has been undertaken include detailed information on:	–
		☒ survey method and effort (as described in BAM Section 5.3)	Section 2.3 Section 2.4 Section 5.3 Figure 15.12
		☒ justification of survey method and effort (e.g. citation of peer-reviewed literature) if approach differs from the department's taxa-specific survey guides or where no relevant guideline has been published	Section 2.3 Section 2.4 Section 5.3

Revised BDAR section	BAM ref.	BAM requirement	Page reference(s) in the revised BDAR
		☒ timing of survey in relation to requirements in the TBDC or the department's taxa-specific survey guides. Where survey was undertaken outside these guides include justification for the timing of surveys	Section 5.3
		☒ survey personnel and relevant experience	Declarations ii
		☒ describe any limitations to surveys and how these were addressed/overcome	Section 2.7
		Where an expert report has been used in place of survey (as described in BAM Section 5.3, Box 3), include:	–
		☒ justification of the use of an expert report ☒ identify the expert, provide evidence of their expert credentials and departmental approval of expert status ☒ all requirements of Box 3 have been addressed in the expert report	Section 5.4 Appendix I
		Where use of local data is proposed (BAM Subsection 1.4.2):	–
		☒ identify relevant species ☒ identify data to be amended ☒ identify source of information for local data, e.g. published literature, additional survey data, etc. ☒ justify use of local data in preference to VIS Classification or TBDC data	Not Relevant
		☒ provide written confirmation from the decision-maker that they support the use of local data	Not Relevant
		Species polygon completed for species credit species present within the subject land (assumed present or determined on the basis of survey, expert report or important habitat map) ensuring that:	–
		☒ the unit of measure for each species is documented	Section 5.5
		for species assessed by area:	–
		☒ the polygon includes the extent of suitable habitat for the target species within the subject land (as described in BAM Subsection 5.2.5)	Section 5.5 Figure 15.12

Revised BDAR section	BAM ref.	BAM requirement	Page reference(s) in the revised BDAR
		☒ a description of, and evidence-based justification for, the habitat constraints, features or microhabitats used to map the species polygon including reference to information in the TBDC for that species and any buffers applied	Section 5.2 Section 5.5
		for species assessed by counts of individuals:	–
		☒ the number of individual plants present on the subject land (as described in BAM Subsection 5.2.5(3.))	Section 5.2 Section 5.5
		☒ the method used to derive this number (i.e. threatened species survey or expert report) and evidence-based justification for the approach taken	Section 2.3 Section 5.2 Section 5.5
		☒ the polygon includes all individuals located on the subject land with a buffer of 30 m around the individuals or groups of individuals on the subject land	Section 2.3 Section 5.2 Section 5.5 Figure 15.12
		☒ Identify the biodiversity risk weighting for each species credit species identified as present within the subject land (as described in BAM Section 5.4)	Section 5.5
		Maps and tables	
		☒ Table showing ecosystem credit species in accordance with BAM Subsection 5.1.1, and identifying:	
		☒ the ecosystem credit species removed from the list	Table 5.4
		☒ the sensitivity to gain class of each species	Table 5.4

Revised BDAR section	BAM ref.	BAM requirement	Page reference(s) in the revised BDAR
		☒ Table detailing species credit species in accordance with BAM Section 5.2 and identifying:	Table 5.5 Table 5.6
		☒ the species credit species removed from the list of species because the species is considered vagrant, out of geographic range or the habitat or microhabitat features are not present	Table 5.1 Table 5.2 Table 5.3 Table 5.4 Table 5.5 Table 5.6
		☒ the candidate species credit species not recorded on the subject land as determined by targeted survey, expert report or important habitat map	Table 5.7 to Table 5.12
		☒ Table detailing species credit species recorded or assumed as present within the subject land, habitat constraints or microhabitats associated with the species, counts of individuals (flora)/extent of suitable habitat (flora and fauna) (as described in BAM Subsection 5.2.6) and biodiversity risk weighting (BAM Section 5.4)	Table 5.12 and Table 5.13
		☒ Map indicating the GPS coordinates of all individuals of each species recorded within the subject land and the species polygon for each species (as described in BAM Subsection 5.2.5)	Figure 15.12
		Data	
		☐ Digital shape files of suitable habitat identified for survey for each candidate species credit species	To be submitted once revised BDAR is finalised
		☐ Survey locations including GPS coordinates of any plots, transects, grids	To be submitted once revised BDAR is finalised

Revised BDAR section	BAM ref.	BAM requirement	Page reference(s) in the revised BDAR
		☐ Digital shape files of each species polygon including GPS coordinates of located individuals	To be submitted once revised BDAR is finalised
		☐ Species polygon map in jpeg format	To be submitted once revised BDAR is finalised
		☐ Expert reports and any supporting data used to support conclusions of the expert report	To be submitted once revised BDAR is finalised
		☐ Field datasheets detailing survey information including prevailing conditions, date, time, equipment used, etc.	To be submitted once revised BDAR is finalised
Prescribed impacts	Section 6	**Information**	
		Identify potential prescribed biodiversity impacts on threatened entities, including:	–
		☒ karst, caves, crevices, cliffs, rocks and other geological features of significance (as described in BAM Subsection 6.1.1) ☒ occurrences of human-made structures and non-native vegetation (as described in BAM Subsection 6.1.2) ☒ corridors or other areas of connectivity linking habitat for threatened entities (as described in BAM Subsection 6.1.3) ☒ waterbodies or any hydrological processes that sustain threatened entities (as described in BAM Subsection 6.1.4)	Chapter 7
		☒ protected animals that may use the proposed wind farm development site as a flyway or migration route (as described in BAM Subsection 6.1.5)	Not applicable

Revised BDAR section	BAM ref.	BAM requirement	Page reference(s) in the revised BDAR
		☒ where the proposed development may result in vehicle strike on threatened fauna or on animals that are part of a threatened ecological community (as described in BAM Subsection 6.1.6)	Chapter 7
		☒ Identify a list of threatened entities that may be dependent upon or may use habitat features associated with any of the prescribed impacts	Chapter 7
		☒ Describe the importance of habitat features to the species including, where relevant, impacts on life cycle or movement patterns (e.g. Subsection 6.1.3)	Chapter 7
		Where the proposed development is for a wind farm:	–
		☒ identify a candidate list of protected animals that may use the development site as a flyway or migration route, including resident threatened aerial species, resident raptor species and nomadic and migratory species that are likely to fly over the proposal area (as described in BAM Subsection 6.1.5)	Not applicable
		☒ provide details of targeted survey for candidate species of wind farm developments undertaken in accordance with BAM Subsection 6.1.5(2–3.)	Not applicable
		☒ predict the habitual flight paths for nomadic and migratory species likely to fly over the subject land and map the likely habitat for resident threatened aerial and raptor species (BAM Subsection 6.1.5(4.))	Not applicable
		Where the proposal may result in vehicle strike:	–
		☒ identify a list of threatened fauna or protected fauna species that are part of a TEC and at risk of vehicle strike due to the proposal	Chapter 7
		Maps and tables	
		☒ Map showing location of any prescribed impact features (i.e. karst, caves, crevices, cliffs, rocks, human-made structures, etc.)	Figure 15.1 Figure 15.2
		☒ Map showing location of potential vehicle strike locations	Figure 15.1

Revised BDAR section	BAM ref.	BAM requirement	Page reference(s) in the revised BDAR
		☒ Maps of habitual flight paths for nomadic and migratory species likely to fly over the site and maps of likely habitat for threatened aerial species resident on the site (for wind farm developments only)	Not applicable
		Data	
		☐ Digital shape files of prescribed impact feature locations	To be submitted once revised BDAR is finalised
		☐ Prescribed impact features map in jpeg format	To be submitted once revised BDAR is finalised
Avoid and minimise impacts	Section 7	**Information**	
		Demonstration of efforts to avoid and minimise impacts on biodiversity values (including prescribed impacts) associated with the proposal location in accordance with Section 7, including an analysis of alternative:	–
		☒ modes or technologies that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed mode or technology	Section 8.1
		☒ routes that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed route	Section 8.1
		☒ alternative locations that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed location	Section 8.1
		☒ alternative sites within a property on which the proposal is located that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed site	Section 8.1

Revised BDAR section	BAM ref.	BAM requirement	Page reference(s) in the revised BDAR
		☒ Describe efforts to avoid and minimise impacts (including prescribed impacts) to biodiversity values through proposal design (as described in BAM Sections 7.1 and 7.2)	Section 8.1 Section 8.2 Section 8.4
		☒ Identification of any other site constraints that the proponent has considered in determining the location and design of the proposal (as described in BAM Subsection 7.2.1(3.))	Section 8.1
		☒ Detail measures or options considered but not implemented because they are not feasible and/or practical (e.g. due to site constraints)	Section 8.1 Section 8.2 Section 8.4
		Maps and tables	
		☒ Table of measures to be implemented to avoid and minimise the impacts of the proposal, including action, outcome, timing and responsibility	Table 8.2
		☒ Map of alternative footprints considered to avoid or minimise impacts on biodiversity values; and of the final proposal footprint, including construction and operation	Figure 15.3
		☒ Maps demonstrating indirect impact zones where applicable	Figure 15.3
		Data	
		Digital shape files of:	–
		☐ alternative and final proposal footprint	To be submitted once revised BDAR is finalised
		☐ direct and indirect impact zones	To be submitted once revised BDAR is finalised

Revised BDAR section	BAM ref.	BAM requirement	Page reference(s) in the revised BDAR
		☐ Maps in jpeg format	To be submitted once revised BDAR is finalised
Assessment of impacts	Section 8, Sections 8.1 and 8.2	**Information**	
		☒ Determine the impacts on native vegetation and threatened species habitat, including a description of direct impacts of clearing of native vegetation, threatened ecological communities and threatened species habitat (as described in BAM Section 8.1)	Section 9.1
		Assessment of indirect impacts on vegetation and threatened species and their habitat including (as described in BAM Section 8.2):	–
		☒ description of the nature, extent, frequency, duration and timing of indirect impacts of the proposal	Section 9.2 Table 9.19
		☒ documenting the consequences to vegetation and threatened species and their habitat including evidence-based justifications	Section 9.2 Table 9.19
		☒ reporting any limitations or assumptions, etc. made during the assessment	Section 9.2 Table 9.19
		☒ identification of the threatened entities and their habitat likely to be affected	Section 9.2 Table 9.19
		Assessment of prescribed biodiversity impacts (as described in BAM Section 8.3) including:	–
		assessment of the nature, extent frequency, duration and timing of impacts on the habitat of threatened species or ecological communities associated with:	–

Revised BDAR section	BAM ref.	BAM requirement	Page reference(s) in the revised BDAR
		☒ karst, caves, crevices, cliffs, rocks and other features of geological significance	Section 9.3.1
		☒ human-made structures	Section 9.3.2
		☒ non-native vegetation	Section 9.3.3
		☒ connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range	Section 9.3.4
		☒ movement of threatened species that maintains their life cycle	Section 9.3
		☒ water quality, waterbodies and hydrological processes that sustain threatened species and threatened ecological communities	Section 9.3
		☒ assessment of the impacts of wind turbine strikes on protected animals	Not applicable
		☒ assessment of the impacts of vehicle strikes on threatened species of animals or on animals that are part of a TEC	Section 9.3
		☒ evaluate the consequences of prescribed impacts	Section 9.3
		☒ describe impacts that are uncertain	Section 9.3
		☒ document limitations to data, assumptions and predictions	Section 9.3
		Maps and tables	
		☒ Table showing change in vegetation integrity score for each vegetation zone as a result of identified impacts	Table 9.6 Table 9.7 Table 9.8
		Data	
		N/A	–

Revised BDAR section	BAM ref.	BAM requirement	Page reference(s) in the revised BDAR
Mitigation and management of impacts	Section 8, Sections 8.4 and 8.5	**Information**	
		Identification of measures to mitigate or manage impacts in accordance with the recommendations in BAM Sections 8.4 and 8.5 including:	–
		☒ techniques, timing, frequency and responsibility ☒ identify measures for which there is risk of failure ☒ evaluate the risk and consequence of any residual impacts	Section 9.4.2
		☒ document any adaptive management strategy proposed	Section 9.5
		Identification of measures for mitigating impacts related to:	–
		☒ displacement of resident fauna (as described in BAM Subsection 8.4.1(2.)) ☒ indirect impacts on native vegetation and habitat (as described in BAM Subsection 8.4.1(3.)) ☒ mitigating prescribed biodiversity impacts (as described in BAM Subsection 8.4.2)	Section 9.4
		☒ Details of the adaptive management strategy proposed to monitor and respond to impacts on biodiversity values that are uncertain (BAM Section 8.5)	Section 9.5
		Maps and tables	
		☒ Table of measures to be implemented before, during and after construction to mitigate and manage impacts of the proposal, including action, outcome, timing and responsibility	Table 9.26
		Data	
		N/A	–

Revised BDAR section	BAM ref.	BAM requirement	Page reference(s) in the revised BDAR
Impact summary	Section 9	**Information**	
		Identification and assessment of impacts on TECs and threatened species that are at risk of a serious and irreversible impacts (SAII, in accordance with BAM Section 9.1) including:	–
		☒ addressing all criteria in Subsection 9.1.1 for each TEC listed as at risk of an SAII present on the subject land	Section 10.1
		☒ for each TEC, report the extent of the TEC in NSW	Section 10.2 Figure 15.14
		☒ addressing all criteria in Subsection 9.1.2 for each threatened species at risk of an SAII present on the subject land	Section 10.1
		☒ for each threatened species, report the population size in NSW	Section 10.3 Section 10.4 Figure 15.14
		☒ documenting assumptions made and/or limitations to information ☒ documenting all sources of data, information, references used or consulted ☒ clearly justifying why any criteria could not be addressed	Section 10.1
		☒ Identification of impacts requiring offset in accordance with BAM Section 9.2	Chapter 11
		☒ Identification of impacts not requiring offset in accordance with BAM Subsection 9.2.1(3.)	Chapter 11
		☒ Identification of areas not requiring assessment in accordance with BAM Section 9.3	Section 11.2
		Maps and tables	
		☒ Map showing the extent of TECs at risk of an SAII within the subject land	Figure 15.14
		☒ Map showing location of threatened species at risk of an SAII within the subject land	Figure 15.14

Revised BDAR section	BAM ref.	BAM requirement	Page reference(s) in the revised BDAR
		Map showing location of:	–
		☒ impacts requiring offset	Figure 15.15
		☒ impacts not requiring offset	Figure 15.15
		☒ areas not requiring assessment	Figure 15.15
		Data	
		Digital shape files of:	–
		☐ extent of TECs at risk of an SAII within the subject land	To be submitted once revised BDAR is finalised
		☐ location of threatened species at risk of an SAII within the subject land	To be submitted once revised BDAR is finalised
		☐ boundary of impacts requiring offset	To be submitted once revised BDAR is finalised
		☐ boundary of impacts not requiring offset	To be submitted once revised BDAR is finalised
		☐ boundary of areas not requiring assessment	To be submitted once revised BDAR is finalised

Revised BDAR section	BAM ref.	BAM requirement	Page reference(s) in the revised BDAR
		☐ Maps in jpeg format	To be submitted once revised BDAR is finalised
Impact summary	Section 10	**Information**	
		Ecosystem credits and species credits that measure the impact of the development on biodiversity values, including:	–
		☒ future vegetation integrity score for each vegetation zone within the subject land (Equation 25 and Equation 26 in BAM Appendix H) ☒ change in vegetation integrity score (BAM Subsection 8.1.1) ☒ number of required ecosystem credits for the direct impacts of the proposal on each vegetation zone within the subject land (BAM Subsection 10.1.2)	Section 9.1 Chapter 11
		☒ biodiversity risk weighting for each	Section 11.1.2
		☒ number of required species credits for each candidate threatened species that is directly impacted on by the proposal (BAM Subsection 10.1.3)	Section 11.1.2
		Maps and tables	
		☒ Table of PCTs requiring offset and the number of ecosystem credits required	Table 11.1 Table 11.2 Table.11.3
		☒ Table of threatened species requiring offset and the number of species credits required	Table 11.5 Table 11.6 Table 11.7
		Data	

Revised BDAR section	BAM ref.	BAM requirement	Page reference(s) in the revised BDAR
		☒ Submitted proposal in the BAM Calculator	To be submitted once the revised BDAR is finalised
Biodiversity credit report	Section 10	**Information**	
		☒ Description of credit classes for ecosystem credits and species credits at the development or clearing site or land to be biodiversity certified (BAM Section 10.2)	Section 12.2
		☒ BAM credit report in pdf format	Appendix E
		Maps and tables	
		☒ Table of credit class and matching credit profile	Appendix E
		Data	
		☒ BAM credit report in pdf format	Appendix E

Appendix B

CPHR consultation

Meeting Minutes

VNI West

Meeting title:	VNI West – BCS Meeting #1	**Date:**	15 February 2024
Location:	Teams	**Time:**	09:30 – 10:30
Chairperson:	Geoffrey Hudson (the Chair)		
Attendees			
VNI West Project Team			
Geoffrey Hudson	Environment Manager – VNI West (Transgrid)		
Wardia Kessal	Environmental Approvals – VNI West (Transgrid)		
Emma Taylor	Project Director - WSP		
Alex Cockerill			
Michelle Patrick, Alex Cockerill, Tuesday Heather	WSP Ecologists -		
Biodiversity, Conservation and Science (BCS)			
Andrew Fisher, Claire Coulson, Helen Waudby, Leigh Maloney, Marcus Wright, Michael Todd, Michela Clark, Simon Maffei			
Apologies			
Devon Raiff	Ecologist - WSP		

Meeting Proceedings

Item	Summary notes
1. Welcome, introductions	The Chair welcomed everyone and asked everyone to introduce themselves.
2. VNI West project introduction	**VNI West project timeline and progress:** *The Chair presented the following:* • Introduction on the VNI West project and overview of the project timeline • Outlined the corridor options process • Consultation processes and amount undertaken • Noted the "where we are in the process" at this point in time • Into the preferred route – 1km wide – around early draft in December and public in early January. Looking to finalise preferred route around March 2024 • Looking to have CSSI declaration – aiming to do this in the next couple of months • Have started ecological/spring surveys - *Emma T - Noted that the slides would be circulated with minutes.* - *Preferred route shapefile were requested by BCS.*

Item	Summary notes
	• - *Miranda K – asked whether undergrounding was planned for the whole line or just the substation entry* - *Miranda K - Clear definition of all impacts need to be considered – there has been challenges in the past with aspects not clearly defined and therefore impacts not able to be determined appropriately* > *Colin M explained no intention for any undergrounding.* > *Colin m / Emma T explained that we are in the process (ongoing) of defining impacts and this meeting is to provide an update and to discuss ongoing ecology program and engagement with BCS*
3. Project development to date	*Jarryd Barton (WSP EIS lead) provided an over view of the development and options process*. • Noted NSW side has been subject to desktop assessment only due to more constraints on property access (private land) as opposed to Victorian side (mostly public reserve land) • Multiple Criteria Analysis (MCA) or similar (Traffic Light Analysis) is being undertaken at both sides • Ongoing regular meetings with TCV to discuss and ensure consistency in assessment processes, timing and route alignment at the border crossing.
4. Approach to environmental assessment – biodiversity matters	*Michelle Patrick / Alex Cockerill (WSP Ecology leads) presented the current and proposed approach to ecology surveys/assessment.* - *Leigh M – If there are any deviations requested from the large area survey guidelines – BCS wants a written clarification early. Would like a few months to review and respond.* - *Miranda K - any existing maps including regional scale PCTs are indicative and Transgrid really survey at grasslands in the area for species composition* > *Alex C – responded that we had this issue with PEC and that early surveys last year were focussed on finding grasslands* - *Michael T – Asked for clarification on 'no approved access'.* > *Emma T clarified that some have said no and some unresponsive and explained that there are ongoing discussions with land owners and we expect some properties will not grant access.* > *Geoff H clarified mainly south of Moulamein is the issue with access.* - *Michael T - Is 31% access of all land or just private land?. MP – just the private and we can access public land holdings on top of the 31% private.* > *Jarryd B - Much of the public land is TSRs* > *Emma T – we will provide additional details (ballpark) of current land access*

Item	Summary notes
	> *Alex C commented that we are running parallel to public roads for much of the route and there remnant ecology adjacent to the road is decent quality so we can survey along the road boundaries* - *Andrew F – how does compulsory acquisition work prior to approvals?* > *Geoff H – Compulsory acquisition is our least preferred approach and we are continuing with landowner access agreements* > *Colin M – access is based on goodwill with property owners and TG does not traditionally use Compulsory acquisition (needs Ministerial sign off)* - *Andrew F commented that 50% access if difficult for BCS to assess* > *Tuesday H - Post approval biodiversity assessment strategy is being discussed with BCS east to look at providing more confirmation on assumed presence* > *Andrew F - reaffirmed that we should be pushing for EIS assessment and not post approvals processes. Conversation for another day. This is a reasonable confronting picture – (the lack of property access so far)*
5. Ongoing consultation with BCD, NSW DCCEEW	• *Alex Cockerill outlined a preferred approach to further consultation with BCS between now and May, 2024*
6. Group discussion and action items	- *AF – thanks and committed to discussing the timing and frequency of ongoing consultation will respond to the information from this presentation* **ACTIONS**: - Transgrid to issue minutes and slide pack - Transgrid provide Shapefile of route corridor to BCS. - Transgrid to provide approximate of hectares we currently have access to in the broader route corridor. - Transgrid to organise follow up meeting to discuss ongoing engagement / field visit approach – subject to B/C's suggested timing of such meetings

Next meeting

Date:	To be confirmed	**Time:**	To be confirmed
Location:	To be confirmed	**Chairperson:**	Geoffrey Hudson

Resources

Item	Link
Draft Route Report	https://www.transgrid.com.au/media/1vbfkt2d/vni_west_draft_route_report-29-january-2024.pdf (PDF 23.3MB)
Preferred Corridor Report	https://www.transgrid.com.au/media/0wue2k4h/vni-west-preferred-corridor-report-october-2023.pdf (PDF 3.66 MB)
Draft Corridor Report	https://www.transgrid.com.au/media/af5d3pry/ps135761-env-rep-001-reva_corridor_rpt_v2-2.pdf (PDF 39.34 MB)
Regulatory Investment Test for Transmission Documents	https://www.transgrid.com.au/projects-innovation/vni-west#Regulatory-Investment-Test-for-Transmission--RIT-T-

Meeting Minutes

VNI West – CPHR team meeting

Meeting title:	Project and BDAR update	**Date:**	20 February 2025
Location:	MS Teams	**Time:**	10 am – 11.30 am
Chairperson:	Geoff Hudson		
Attendees:			**Apologies:**
CPHR: • Adam Vey • Andrew Fisher (AF) • Georgina Xu • Marcus Wright • Simon Maffei (SM) • Clare Coulson • Leigh Maloney (LM) • Mel Cotterill	• Michael Todd (MT) • Miranda Kerr (MK) **Transgrid:** • Geoff Hudson (GH) • Colin Mayer (CM) • Daniel Whaite (DW) • Tuesday Heather • Ben Coddington • Andrew Cook	**WSP:** • Alex Cockerill (AC) • Caitlin Bennet • Emma Taylor Michelle Patrick (MP) • Damian Williams **DPHI:** • Julie Green	Nil

Agenda items

Note: refer to attached presentation for the content provided at the meeting.

Agenda item	Notes	Actions
1. Project overview	An overview of the project components was provided, including: • NSW/Victorian border to Dinawan substation • Network augmentation works between existing Wagga substation to future Gugaa substation The timing of the EIS was also provided with exhibition expected mid-year.	
2. Ecology survey update	An overview of surveys undertaken to date was provided with reference to BAM requirements, areas surveyed and access limitations. Discussion points included: • Assessment area clarification: - MP provided clarification that the 500-metre buffer for assessment area is on either side of the transmission line centreline (i.e. total width of about 1,000 metres) • Property access constraints: - AF asked what is the process to try and gain access to the main restricted access landholding as there is difficulty with delaying survey to the post-approval process? - GH and CM noted that Transgrid are continuing to try and get access with the landholder. It is probable that access will continue to be denied and that a compulsory acquisition process will need to be followed. - AF requested that CPHR team are kept up to date on the status of this.	

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Agenda item	Notes	Actions
	• Use of HumeLink data: - LM asked whether all the HumeLink data has been field verified or are there areas relying on SVTM - Humelink data shared for VNI West has been ground-truthed by Niche as part of that project. This data can be provided to CPHR if required. - *Post-meeting note: WSP conducted surveys of the Humelink area (that overlaps with VNI West) and new areas in the last week of February 2025. Access was not available for three holdings. The WSP surveys will be included in the final BDAR.* • Threatened flora effort: - LM asked how have surveys been carried out and how have guidelines been applied? - MP stated that two-phased grids and transects were undertaken. - Gilgai searches were conducted as part of the microhabitat searches for threatened flora. These surveys were fine scale searches and conducted in these locations to search for threatened flora. Gilgais were recorded and an assessment of the habitat condition identified. - MP also provided clarification that *Swainsona murrayana* has been identified during surveys. • Threatened fauna effort: - MT queried the phascogale and squirrel glider surveys and their completion status - MP stated they have been completed. A species expert report is also being prepared by Rodney van der Ree who is an approved species expert for these species.	
3. Vegetation clearing approach	An overview of the vegetation clearing approach for the project and BDAR was provided. This included the adoption of a partial clearing approach similar to Project EnergyConnect (PEC) with partial impact disturbance areas A, B4, B10 and hazard tree zone assessed in the BDAR Discussion points included: • AF requested the partial clearing assessment approach is provided in a memo to CPHR for further consideration before the BDAR is submitted • LM wanted to know if there has been data collected in construction areas for PEC East to provide a stronger evidence base to justify the proposed approach being applied. LM also stated that this about post-clearing impacts not about post-rehabilitation resultant condition. • AC noted that based on his recent post-construction surveys of PEC West, the scores were demonstrating greater VI than assessed and approved within the BDAR. This includes a number of vegetation formations directly relevant to VNI West.	**Action:** WSP to prepare a partial clearing assessment approach memo and submit to CPHR by11 April 2025

Agenda item	Notes	Actions
	• MK suggested PEC West is a different scenario to PEC East. Ecosystems on PEC East are more relevant to VNI West and assessing VI condition closely following clearing works is more applicable. For PEC West, there was no assessment of VI condition along the construction route as works were completing. There was also no monitoring to enable review of clearing practices and to allow for changes. • LM would like to see data from PEC East to support the partial clearing approach being proposed. CPHR accept that partial clearing is a good process for avoidance of impacts and to minimise impact. However, the focus needs to be on what the actual impacts are though in reality with VI score reductions, not the resultant condition. • DW acknowledged that there have been some performance issues with undertaking partial clearing on previous projects. However, Transgrid are looking to achieve an offset obligation which reflects the resultant impact level follow rehabilitation. • MK suggested construction contractors need to be better informed of partial clearing approach. Transgrid need to make it clear to contractors what partial impacts means and what implementation processes are needed. It was suggested that this has not been demonstrated sufficiently on PEC. • SM stated that PEC East has a requirement for data to be collected within 3 months of clearing works – this timeframe establishes the impact assessment parameters. It does not specify the rehabilitated state at a time substantially longer than that timeframe.	
Biodiversity offsets approach	An overview of the biodiversity offset strategy for the project was provided and it was noted that it was progressing well and likely to include significant portion of the ecosystem liability secured prior to EIS exhibition. However, due to the scale and complexity the project would be seeking mechanism of deferment. Discussion points included: • AF noted that with respect to request for offset obligation deferment this requires further approval and discussion before it can be agreed that it will be applied.	
Site visit opportunities	The potential for the CHPR team to undertake a site visit was discussed. SM requested Transgrid provide a schedule of upcoming surveys so the CHPR team can consider.	**Action:** Transgrid to provide schedule of upcoming surveys
Other discussion	AF requested that in addition to the partial clearing assessment approach memo, they would like to see another memo that includes the BDAR survey and assessment methodology and how it meets the BAM before the BDAR is submitted.	**Action:** WSP to prepare a BDAR survey and assessment methodology memo and submit to CPHR by 30 April 2025

Next meeting

Date:	TBC	**Time:**	TBC
Location:	MS Teams	**Chairperson:**	Geoff Hudson

Official

Meeting Minutes

VNI West – Update on draft BDAR, assessment methodology

Meeting title:	VNI West – BCS Meeting #1	**Date:**	30 April 2025
Location:	Teams	**Time:**	12.00 – 12:30pm
Chairperson:	Geoffrey Hudson (the Chair)		
Attendees			
VNI West Project Team			
Geoffrey Hudson (GH)	Environment Manager – VNI West (Transgrid)		
Wardia Kessal (WK)	Environmental Approvals – VNI West (Transgrid)		
Andrew Cook (AC)	Environmental Approvals – VNI West (Transgrid)		
Emma Taylor (ET)	Project Director - WSP		
Alex Cockerill (AC-WSP)	Lead Ecologist (National Executive)- WSP		
Conservation Programs Heritage and Regulation CPHR -			
Andrew Fisher, Adam Vay, Leigh Maloney, Simon Maffei, Mel Cotterill			
Apologies			

Meeting Proceedings

Item	Summary notes
1. Welcome, introductions	.
2. VNI West project presentation	Presentation was run through and this is provided as an attachment to the minutes
3. Key Discussion Points	• . Key discussion points: **Partial clearing approach** MC queried method for survey of field data from PEC- West project AC responded: The number of plots does not replicate a full BAM plot survey for the project. Not reasonable and feasible to do this based on scale of project. Where possible, three sample paired plots for each PCT have been targeted. For all PCTs multiple replicates have been collected. Noting that PCTs with existing disturbance have been avoided for the assessment of Partial Impact within Disturbance area B. • In relation to timing the sampling has typically been as follows post construction of the project: PEC – West data: collected between 12-24 months post construction at the sites PEC – East data: collected about 12 months from initial vegetation clearing noting variable in relation to when construction was completed as some sites still have some construction works occurring (i.e. stringing activities)

Item	Summary notes
	LM queried how the sampled sites were selected: • AC responded: Sites have been selected to be representative of the following key items: Areas of better condition PCTs. Having higher VI scores Considered land use practices – to avoid the influence of impacts from other practices on construction disturbance (i.e. avoiding grazing areas) PEC – West sites – focused on reasonable representative areas of the construction partial impact, including where there had been a canopy impact from construction activities (i.e. avoided areas where no canopy impact so not skewing results) AC noted – offer to validate results in the field with CPHR if this was beneficial. LM noted would be good to see the locations and data before any site visit. AC noted the BDAR appendix on partial impact would be provided this week for information with this detail – noting it covers the PEC-West data points only (PEC-East would come later once analysed) ET noted that the proposed approach in relation to exhibition BDAR data inclusion in relation to partial impacts and subsequent update at Amendment Report stage (with PEC-East data) has been briefed to DPHI assessment team as well. **Remote assessment biodiversity values BAM guide:** MC acknowledges that inclusion of this approach into the EIS BDAR was not anticipated due to timing. MC noted that keen to work in collaborative manner in relation to application of the guideline to the project. It was agreed that the following process would generally occur to enable further work on this matter • **Actions** -Transgrid to prepare a short (1 pager) letter for initial application for the guide to be applied to the VNI West project (for Amendment Report BDAR phase of works). • Pending response to application the aim would be to set-up working session to discuss the details of how the guide could be applied and to which properties/species etc. Process for this will be determined based on response to initial application. Ideal timing for this would be June onwards.

Next meeting

Date:	Sunday, 1 June 2025	**Time:**	To be confirmed
Location:	To be confirmed	**Chairperson:**	Geoffrey Hudson

Subject: RE: HPE CM: VNI West 1st Biodiversity briefing [Official] - proposed 2nd Biodiversity briefing
Sent: 20/12/2023, 5:41:47 PM
From: Geoffrey Hudson<Geoffrey.Hudson@transgrid.com.au>
To: Simon Maffei
Cc: Joel Annett; Wardia Kessal; Daniel Whaite; Williams, Damian; Cockerill, Alex; Barton, Jarryd; ROG South West Region Mailbox; Taylor, Emma; Colin Mayer

---

Hi Simon, thanks for your email and yes we have considered these priority watering sites in our constraint analysis. Our draft route report will be released to public on the **29th January 2024** (open to a five week consultation/submission process) and we would like to organise a meeting with yourself and other relevant B/C team members to run through with you the findings of this report including our analysis/assessment process, avoidance of identified significant constraint areas, findings of some of the limited ecological field studies already completed and anything you/team would like to discuss further.

The overall aim of these proposed ongoing briefings is to ensure you and your team are kept up to date with our progression of a preferred route and into the EIS phase.

We also intend to get you/team out in the field (time suitable to you/team) with our WSP ecology leads to further understand the project constraints, opportunities, etc.

Could you please let me know some potential dates/times after the 29th Jan 2024 that would be suitable for "Teams" catchup and I will then lock in a date and time. Noting that we will also be requesting a further "ongoing" briefing with DPE i.e. Clay Preshaw and Nicole Brewer and would be happy if you want to line the above requested meeting with this proposed DPE.

Thanks and regards

Geoff

Geoffrey Hudson
Environment Manager – VNI-West | Major Projects

Transgrid | 180 Thomas St Sydney, NSW, 2000
Mobile 0436 928 001
E: Geoffrey.Hudson@transgrid.com.au **W:** www.transgrid.com.au



Data Classification: Official

From: Simon Maffei <Simon.Maffei@environment.nsw.gov.au>
Sent: Wednesday, December 20, 2023 11:27 AM
To: Geoffrey Hudson <Geoffrey.Hudson@transgrid.com.au>
Cc: Joel Annett <Joel.Annett@transgrid.com.au>; Wardia Kessal <Wardia.Kessal@transgrid.com.au>; Daniel Whaite <Daniel.Whaite@transgrid.com.au>; Williams, Damian <Damian.Williams@wsp.com>; Cockerill, Alex <Alex.Cockerill@wsp.com>; ROG South West Region Mailbox <rog.southwest@environment.nsw.gov.au>
Subject: RE: HPE CM: VNI West 1st Biodiversity briefing [Official]

Hi Geoff,

Following on from the biodiversity briefing last month, we sat down with internal staff from our Threatened Species and Environmental Water teams to discuss this project. They noted that there are a considerable number of priority watering sites within the proposed corridor that they deliver environmental water to for threatened species.

Attached is a shapefile that identifies the locations of the priority watering sites within the project study area.
It would be appreciated if this data could be considered in the project constraints mapping to ensure these actively managed sites are avoided as far as possible.

We have considerable data from these sites, including Southern Bell Frog records that have not yet made it into BioNet. This data can be provided in the new year if requested.

If you have any questions or would like get access to some of the site records, don't hesitate to contact me.

Thanks
Simon

Simon Maffei
Senior Project Officer Planning – South West

Biodiversity and Conservation | Department of Planning and Environment
T 02 6022 0646 | **E** simon.maffei@environment.nsw.gov.au
620 Macauley St, Albury NSW 2640
www.dpie.nsw.gov.au

Contact the South West Planning Team about biodiversity and flood management planning matters by emailing rog.southwest@environment.nsw.gov.au.

NSW GOVERNMENT

The Department of Planning and Environment acknowledges that it stands on Aboriginal land. We acknowledge the traditional custodians of the land and we show our respect for elders past, present and emerging through thoughtful and collaborative approaches to our work, seeking to demonstrate our ongoing commitment to providing places in which Aboriginal people are included socially, culturally and economically.

From: Geoffrey Hudson <Geoffrey.Hudson@transgrid.com.au>
Sent: Monday, 20 November 2023 5:21 PM
To: ROG South West Region Mailbox <rog.southwest@environment.nsw.gov.au>; Adam Vey <Adam.Vey@environment.nsw.gov.au>; Simon Maffei <Simon.Maffei@environment.nsw.gov.au>; Michael Todd <Michael.Todd@environment.nsw.gov.au>; Miranda Kerr <Miranda.Kerr@environment.nsw.gov.au>; Leigh Maloney <leigh.maloney@environment.nsw.gov.au>; Marcus Wright <Marcus.Wright@environment.nsw.gov.au>; Claire Coulson <claire.coulson@environment.nsw.gov.au>; Andrew Fisher <Andrew.Fisher@environment.nsw.gov.au>
Cc: Joel Annett <Joel.Annett@transgrid.com.au>; Wardia Kessal <Wardia.Kessal@transgrid.com.au>; Daniel Whaite <Daniel.Whaite@transgrid.com.au>; Williams, Damian <Damian.Williams@wsp.com>; Cockerill, Alex <Alex.Cockerill@wsp.com>
Subject: HPE CM: VNI West 1st Biodiversity briefing [Official]

Hi thanks for you time the other day. I have attached the general presentation outlining the VNI West project and as discussed we will contact you with a further update and discussion on survey methodology around March next year just prior to submitting our scoping report. You can also find further information on the project at https://www.transgrid.com.au/projects-innovation/vni-west

In the meantime if you have any questions please come back to me.

Thanks and regards
Geoff

Geoffrey Hudson
Environment Manager | Major Projects

Transgrid | 180 Thomas St Sydney, NSW, 2000
T: (02) 9284 3496 **M:** 0436 928 001,
E: Geoffrey.Hudson@transgrid.com.au **W:** www.transgrid.com.au

Transgrid

We acknowledge the Aboriginal and Torres Islander people as the Traditional Custodians of the land which we provide our services. We pay our respects to their Elders, past and present.



Data Classification: Official

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Meeting Minutes

VNI West – Update on draft BDAR, assessment methodology – Follow on meeting

Meeting title:	VNI West – CPHR Meeting #3	**Date:**	5 June 2025
Location:	Teams	**Time:**	09.00 – 10:00am
Chairperson:	Wardia Kessal (the Chair)		
Attendees			
VNI West Project Team			
Wardia Kessal (WK)	Environmental Approvals – VNI West (Transgrid)		
Andrew Cook (AC)	Environmental Approvals – VNI West (Transgrid)		
Daniel Whaite (DW)	Biodiversity Manager - Transgrid		
Emma Taylor (ET)	Project Director - WSP		
Alex Cockerill (AC-WSP)	Lead Ecologist (National Executive)- WSP		
Devon Raiff (DR)	Ecologist - WSP		
Caitlin Bennett (CB)	Project REAP - WSP		
Conservation Programs Heritage and Regulation CPHR -			
Andrew Fisher (AF), Leigh Maloney (LM), Simon Maffei (SM), Mel Cotterill, Miranda Kerr (MK), Georginni Xu, Michael Todd, Michelle Cox (MC)			
Apologies			
Geoffrey Hudson (GH)	Environment Manager – VNI West (Transgrid)		

Meeting Proceedings

Item	Summary notes
1. Welcome, introductions	
2. VNI West project presentation	Presentation was run through, and this is provided as an attachment to the minutes. The presentation included the following key items: • VNI West (NSW) – Project Status • Assessment approach & survey status • Overview of biodiversity impacts • Proposed mitigations • Offsets strategy • Amendment report consideration: Remote Assessment guidelines • Next steps
3. Key Discussion Points	1. ET Identified that traffic intersections / road upgrade and maintenance impacts not currently included in impact footprint assessment as these are still under consultation with Councils and TfNSW.

Item	Summary notes
	2. AF- query – will this be clearly identified in the EIS/ BDAR that this is still to come? ET – response - yes this is identified in the documentation. 3. MC - query – is some of the assumed presence for these species linked to access restrictions? 4. AC WSP - response - yes much of it is. Not all but a good deal and this is being worked through. 5. MK - query – have these been established under separate BAM-C case? AC WSP - response - not yet. To be established as part of Amendment Report BDAR 6. General Note – further discussion needed as to how to set up calculators, etc for the next Amendment BDAR and get agreement before these are set up. 7. AF - Mitigations - Compensatory habitat strategy approach. Noted proposed is supported so best outcomes can be achieved. 8. AF - Partial Impacts: Clarification that there is to be more work done on this as part of Amendment Report, including incorporation of EnergyConnect Eastern Section data. Response AC WSP: This is correct, this will be included as part of the Amendment Report BDAR. Comments from CPHR received this week on the submitted approach being adopted in EIS BDAR is acknowledged. 9. LM – Plains Wanderer SAII assessment approach? AC WSP – response - Additional survey has been completed, mainly focuses on areas east of the Cobb Highway (2 small areas to the west). BDAR discusses areas of additional potential habitat outside of important mapped habitat and TBDC listed associated habitat (i.e. areas of sparse chenopod shrubland). 10. MC - what is to be provided for early application of guidelines? AC WSP – response - high level approach to be submitted. Not detailed assessment of the outcomes. Intent to state in the exhibition EIS BDAR that we would be seeking to adopt the guidelines as part of an Amendment Report. 11. ET asked Question to CPHR on early information provision: AF- response - CPHR noted that they prefer to receive the full package of data at EIS submission time, not in advance. It is noted that there is to be notable change to the Amendment BDAR and therefore information in EIS BDAR will be subject to notable change. 12. ET - query on final GIS data provision & query on format of data. Please refer to options included in **Appendix to minutes** below**.** Action: CPHR to confirm their preferred format in response to these minutes. 13. AF - site visit request for 1 day in the field with WSP ecology team: AF/SM will respond to minutes on particular areas where they would like to focus on. i.e. Moulamein area to the south and preferred timing

Item	Summary notes
	14. AF - query - on status of the Victorian VNI section of the project WK – response - taken on notice and a response to be provided by Transgrid (actioned – please refer to Actions section below).
4. Actions	**1. CPHR to confirm their preferred final GIS data provision and format in response to these minutes.** **2. AF/SM will respond to minutes on particular areas where they would like to focus on for the field inspection. i.e. Moulamein area to the south and preferred timing** 3. Transgrid to provide status of the Victorian VNI section of the project. Transgrid response - TCV (Transmission Company Victoria) has been facing challenges in obtaining access to private properties which has impacted their ability to undertake studies required for the EES (Environmental Effects Statement). Transgrid anticipates this will result in a delay to the project delivery of the transmission line component of over about 2 years. TCV are anticipated to make a formal announcement at the end of this financial year.

Next meeting

Date:	To be confirmed	**Time:**	To be confirmed
Location:	Online	**Chairperson:**	Wardia Kessal

Appendix to Minutes - GIS data provision query for BDAR/EIS submission:

WSP GIS team seek CPHR clarification of the following items prior to final spatial packaging.

Note - A meeting to discuss the options can be arranged if this is CPHR preference. Advice is sought by 30 June to assist with preparation of data for submission.

1. Item 1. Species polygons

CPHR to confirm adoption of following option (s).

- **Option 1** - Amalgamation of assumed / confirmed species polygons into a 'clean' dataset – note this approach does not preserve PCTs / IBRAs or multicriteria analysis workings.

i.e. ECO_WSP_BDARv2_Fauna_PolygonsConsolidated_GDA20z55_XXXX

ECO_WSP_BDARv2_Fauna...GDA20z55_250521

Field: Add Calculate Selection: Select By Attributes Zoom To Switch Clear Delete Copy

	OBJECTID *	Shape *	MERGE_SRC	Species	Type	Shape_Length	Shape_Area
1	2	Polygon ZM	ECO_WSP_BDARv2_Fa...	Australian Bustard	Assumed	125651.838092	6076512.993795
2	3	Polygon ZM	ECO_WSP_BDARv2_Fa...	Australian Bustard	Exclude on both bird...	668443.979878	24069806.203793
3	4	Polygon ZM	INTERSECT_WSP_BDAR...	Barking Owl	Assumed	101391.208916	2236799.840637
4	5	Polygon ZM	INTERSECT_WSP_BDAR...	Black Breasted Buzzard	Assumed	16736.821572	194660.880176
5	6	Polygon ZM	INTERSECT_WSP_BDAR...	Bush Stone-Curlew	Assumed	288269.244451	7389624.544561
6	7	Polygon ZM	ECO_WSP_BDARv2_Fa...	Bush Stone-Curlew	Confirmed	5384.623199	233284.886498
7	8	Polygon ZM	ECO_WSP_BDARv2_Fa...	Gang-Gang Cockatoo	Removed based on lac...	13116.138295	136579.814165
8	9	Polygon ZM	ECO_WSP_BDARv2_Fa...	Gang-Gang Cockatoo	Assumed	680.850557	6391.731126
9	10	Polygon ZM	ECO_WSP_BDARv2_Fa...	Grey Snake	"Unsuitable habitat"	43588.357254	315908.556576
10	11	Polygon ZM	ECO_WSP_BDARv2_Fa...	Grey Snake	Assumed	377714.317283	10693587.967076
11	12	Polygon ZM	ECO_WSP_BDARv2_Fa...	Koala	Assumed	187461.308501	4223048.68446
12	13	Polygon ZM	ECO_WSP_BDARv2_Fa...	Little Eagle	Exclude on both bird...	387296.986994	10932604.90834
13	14	Polygon ZM	ECO_WSP_BDARv2_Fa...	Little Eagle	Assumed	47182.792572	1129312.038652

0 of 26 selected Filters:

- **Option 2** - Provision of individual species polygon layers – noting this approach ensure ALL PCT / metadata is retained inclusive of suitable habitat commentary.

i.e. ECO_WSP_BDARv2_Ammobium_craspedioides_Assumed_SubjectLand_GDA20z55_250513

IMPACT_ECO_WSP_BDARv...GDA20z55_250513 ECO_WSP_BDARv2_Ammob...GDA20z55_250513

Field: Add Calculate Selection: Select By Attributes Zoom To Switch Clear Delete Copy

		vegClass	IBRA_SUB_N	IBRA_REG_N	Area_H2	EPBC_Statu	SAll	BC_Status	Acraspedioides	Shape_Length	Shape_Area
1	assy Woodl...	Western Slopes Grassy...	Inland Slopes	NSW South Western S...	0.03314	Critically Endangered	Yes	Critically Endangered	Assumed	66.783784	331.399118
2	assy Woodl...	Western Slopes Grassy...	Inland Slopes	NSW South Western S...	0.363107	Critically Endangered	Yes	Critically Endangered	Assumed	727.199817	3631.072272
3	assy Woodl...	Western Slopes Grassy...	Inland Slopes	NSW South Western S...	0.025125	Critically Endangered	Yes	Critically Endangered	Assumed	64.017009	251.249286
4	assy Woodl...	Western Slopes Grassy...	Inland Slopes	NSW South Western S...	0.059295	Critically Endangered	Yes	Critically Endangered	Assumed	88.116537	592.953267
5	assy Woodl...	Western Slopes Grassy...	Inland Slopes	NSW South Western S...	0.225838	Critically Endangered	Yes	Critically Endangered	Assumed	390.837678	2258.3805
6	assy Woodl...	Western Slopes Grassy...	Inland Slopes	NSW South Western S...	0.009824	Critically Endangered	Yes	Critically Endangered	Assumed	43.665635	98.236379
7	assy Woodl...	Western Slopes Grassy...	Inland Slopes	NSW South Western S...	0.055131	Critically Endangered	Yes	Critically Endangered	Assumed	115.291663	551.306328

- **Option 3** - Provision of both Option 1 and Option 2 dataset – noting this has been supplied to Transgrid and has resulted in some confusion given the duplication of data supplied.

2. Item 2. Metadata

CPHR is requested to provide approved example of suitable metadata standards for spatial packaging.

3. Item 3. BDAR Data supply package

CPHR to please confirm data supply format / structure.

WSP propose spatial data be divided into appropriate sub geodatabases rather than singular geodatabase (inclusive of all layers). Example of this option provided below for comment:

File geodatabase

To assist end user review, WSP proposed to provide the following project geodatabases (split into categories relevant to the BDAR).

File geodatabase (name)	Examples of layers (non-exhaustive).
BDARv2_LandscapeFeatures.gdb	I.e. Native vegetation assessment area and associated layers, regional connectivity, IBRA / Mitchell landscapes etc.
BDARv2_DesignFeatures.gdb	I.e. Design elements utilised for this version of the BDAR (i.e. transmission line centrelines, substations, compounds, existing transmission lines).
BDARv2_SurveyEffort.gdb	I.e. Flora survey effort (BAM / Rapids, Microhabitat searches, Cat Assessment), survey tracks, Fauna survey effort (habitat tree points, scattered trees), significant species surveys ect.
BDARv2_SurveyResults.gdb	I.e. Field validated vegetation layers (apply definition query for EPBC TECs, BC TECs), Consolidated species polygons (apply query for singular species)
BDARv2_DisturbanceImpacts.gdb	I.e. All final layers utilised in BAM C calculations (i.e. impact field validated vegetation / TECS / EPBCS, species polygons (assumed / confirmed), scattered trees, significant species ect.
BDARv2_Working_SpeciesPolygons.gdb	I.e. All buffers, site features and layers utilised for the creation of final species polygons.

Accompanying spatial register

An excel document detailing feature class / file name and description used for each figure in BDAR (example provide below). Option to add additional field detailing definitions queries (if applicable).

BDAR Figure Reference	Feature class/file Name	Description
PS138962_BDAR_F015_1_SiteMap_r2v4		
	PLAN_LINE_TG_Transmission_lines_FullNSW_GDA20z55_240417	Regional connectivity
	ENV_POLY_NSW_National_Parks_Managed_Land_GDA20z55_231115	National park
	DESIGN_WSP_BDAR_DisturbanceImpactArea_250319_v804_GDA2020z55	Indicative disturbace footprint
	ECO_WSP_BDARv2_Rocky_Habitat_GDA20z55_250519	Rocky habitat
	T20250128_VNI_W_ProjectFootprint_Rev1_8_MGA55_GDA2020	Subject land
	CONSTRUCTION_WSP_DisturbanceFootprint_RtS_Eastern_v1_220304_GDA20z55	PECe disturbance area
	T20240821_VNI_W_Dinawan_Substation_Footprint_Combined_Rev1_1_MGA55_GDA2020	Dinawan\VNI-W - Dinawan Layout - Poly
	DESIGN_TG_VNI_W_LayoutConversion_Line_250319_GDA20z55	Dinawan\Dinawan substation works - proposed 500kV
	PlacePoint	Locality (NSW and VIC)\PlacePoint
	Locality_Point	Locality (NSW and VIC)\Locality_Point
	PLAN_LINE_Existing_Infrastructure_EnergyConnect_high_voltage_GDA20z54_240402	EnergyConnect (NSW - Eastern section) (under construction)
	PLAN_LINE_TG_Transmission_lines_FullNSW_GDA20z55_240417	Existing transmission line
	PLAN_LINE_Existing_Infrastructure_Rail_GDA20z55_231115	Rail line
	LINE_PLAN_WSP_RoadNameExtent_GDA20z55_250220_v2	Main road
	LINE_HYDRO_WSP_NamedWaterways_GDA20z55_250220_v2	Named waterway
	PLAN_LINE_Existing_Infrastructure_Rail_GDA20z55_231115	Rail line
	naluma_nsw_2017_abpl0_c20240729_u12_Clipped_GDA20z55_250410	Excluded land (Category 1) (NVR 2025)
	T20241217_VNI_W_CampAreas_Rev1_93_MGA55_GDA2020	Construction compound
	T20241217_VNI_W_CampAreas_Rev1_93_MGA55_GDA2020	Combined temporary worker accomodation facility
	IBRASubegion_Aust70	IBRA subregion - Outine
	AUSTRALIA_STATES_BOUNDARY	AUSTRALIA_STATES_BOUNDARY
	IBRASubegion_Aust70.shp	IBRA subregion
	MitchellLandscapes_v31_GDA20z55	Mitchell Landscapes

Meeting notes

Project name	VNI West
Project number	PS138962
Date	Monday, 15 September 2025
Time	2 pm
Venue	MS Teams
Subject	Remote Areas Access Guidelines application
Client	Transgrid
Attendees	Tuesday Heather (TH) – Transgrid Geoffrey Hudson (GH) - Transgrid Wardia Kessel (WK)- Transgrid Andrew Fisher (AF) – DCCEEW Jake Manners (JM) – DCCEEW Leigh Maloney (LM) - DCCEEW Mel Cotteril (MC) – DCCEEW Michelle Cox (MC) – DCCEEW Simon Maffei (SM) - DCCEEW Alex Cockerill (AC) – WSP Michelle Patrick (MP) – WSP Emma Taylor (ET) – WSP Mik Barrow (MB) – WSP
Apologies	Damien Williams (DW) – WSP
Distribution	As above plus: Click-here-to-type

Key Actions

1. Minutes and presentation shared with all attendees at the meeting.
2. As outlined in the presentation, feedback from DCCEEW for the VNI West project to apply the remote access guidelines as well as advice of any additional considerations.
3. The memo will be updated with a final review and appended to the amendment BDAR with further consultation with DCCEEW.

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We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

Matters arising		Action
1.1	Itinerary for upcoming field surveys — MP provided access updates for upcoming DCCEEW site visit with MP and AC, suggesting attendees meet at Swan Hill and then car pool together to limit amount of vehicles — SM agreed	N/A
1.2	Overview of restricted holdings where the Remote Areas Access Guidelines are applied — MP identified holdings with restricted access across the alignment including holdings 208, 219, 281. 286. 287 (Murray Fans IBRA subregion) and holding 366 (Murrumbidgee IBRA sub region) and outlines site and soil characteristics of each	WSP to send DCCEEW slide pack from meeting
1.3	Determination of PCT's and vegetation conditions — MP discussed the PCT identification and vegetation condition approach including the use of rapid flora survey points (collected when access to the site was provided), surveys of adjacent properties and roadways — MP outlines the PCTs and vegetation condition of each holding — MP notes that WSP were able to field verify or apply PCT identification and vegetation condition based on previous surveys within subject land and the teams understanding of the broader landscape — MP notes that the SVTM was not always correct and ground truthing identified other PCTs — MP asked for initial feedback — JM noted some concern over the transparency of how the surveys have been conducted and requests more information to support the surrogate surveys including plot locations on mapping as well as the spatial files and BAM-C data for the individual holdings — JM requested additional information on how the final mapping relates to NVR mapping — MC notes a previous discussion regarding potential changes to the alignment around holding 366 and questions if there has been any outcomes and if there would be any changes to the memo — ET notes that no decision has been made and WSP/Transgrid are progressing with current alignment, noting that any future changes would have to be reflected in the memo — MC asked if the Category 1 mapping is based on the NVR data — AC noted that the Category 1 shown on WSP's maps are based on the NVR dataset — MC question how prescribed impacts would be considered in regard to Category 1 — AC note that this is a matter to discuss in relation to the guidelines — MC asked about rapid data points and why this method was chosen — AC notes that access within some holdings was limited or has been revoked resulting in data points being collected within a rapid timeframe — MC states there needs to be a narrative explain why rapid survey points were collected, outlining why and how access was requested and providing a reason as to why it was limited/ revoked. — JM asked if all survey plots were used for the BAM-C or if it is just based on the closed survey plots and if WSP can include a summary of the plots used in the memo — JM requested WSP explain how the survey plots correspond to the state mapping within the Mitchell Landscapes, particularly where WSP is noting that the SVTM is not accurate	WSP to provide DCCEEW with additional information of how final mapping relates to NVR mapping WSP to discuss approach to addressing prescribed impacts with regard to Category 1 land with DCCEEW WSP to include in memo: — Provide maps identifying the survey and spatial files for the individual holdings as part of the BDAR and BAM-C — Justification of the use of rapid survey points during surveys in memo — WSP can include a summary of the plots used in the memo including their location in relation to the restricted holdings — Outline how the survey plots correspond to the state mapping within the Mitchell Landscapes
1.4	Habitat suitability of threatened fauna	N/A

	— AC notes WSP opted for a precautionary approach and assumes presence of threatened fauna based on associated habitat (PCTs and vegetation condition) — DCCEEW did not object the presented approach	
1.5	Habitat suitability of threatened Flora — AC noted seven threatened flora species recorded on surveyed land across both IBRA sub-regions are assumed present on restricted holdings and noted there may be an opportunity to restrict assumed presence based on remote desktop habitat features instead of PCTs — JM requested additional details regarding each species and consultation to discuss an acceptable count method — AC noted each species presented in the slide deck are from surveys completed on the surrogate land and the entire alignment in each IBRA sub-region has been used to calculate the surrogate land and this may need further refinement. — JM requested additional analysis of available online data such as Bionet, and mapping of where the survey locations area to flip the approach from a stratification approach to a surrogacy approach showing proximity to the alignment and biodiversity study area — LM mentions inconstancies in the application of the survey locations and request that the surrogate site reflects the specific restricted site instead of across the entire alignment. — AC notes that there would be modification off the back of the DCCEEW submission and WSP would cross check the submission to guide updates to the memo in the preparation of the amendment BDAR	WSP to provide additional details on the flora species AC consult with DCCEEW regarding an acceptable threatened flora count method WSP to conduct additional analysis of available data and map the surrogate survey locations
1.6	Engagement with Commonwealth — MC questions if WSP/ Transgrid has discussed the approach with Commonwealth given there are some commonwealth listed species — AC notes there has been engagement with Commonwealth to date and would continue to occur	GH to set up a meeting between Transgrid, WSP- and the Cth to flag topics discussed today
1.7	Changes in access agreements — JM questions why access was not available in the holdings discussed above — GH noted that this was because of landholder restrictions and noted that negotiation is still in progress to gain access — JM question if these access arrangements would change, would the application of the guidelines to the project change — ET notes that access changes would be taken into account and WSP/Transgrid would advise DCCEEW if access changes and inform on revised approach.	Transgrid would advise if access there are any changes in the agreement and the memo updated.
1.8	Meeting closeouts and housekeeping — JM notes updates should go through the DCCEEW southwest mailbox	ET to consolidate and send through meeting minutes ET to advise on expected response timeframe once discussed with Transgrid and the WSP team

Next meeting

An invitation will be issued if an additional meeting is required.

Meeting Minutes

Meeting title:	VNI West REBS Catchup	**Date:**	23 April 2026
Location:	MS Teams	**Time:**	12 - 1 pm
Attendees:			
REBS: Michelle Cox, Jake Manners, Leigh Maloney, Renee Shepherd, Simon Maffei WSP: Alex Cockerill, Michelle Patrick, Emma Taylor Transgrid: Tuesday Heather, Wardia Kessal, Daniel Whaite			

Agenda items

Agenda item	Notes	Decisions / actions
BDAR update ***Key Changes since EIS***	Refer to attached presentation	N/A
Program and current status	Refer to attached presentation	N/A
Current impacts – including SAII & MNES	1. Leigh Maloney: Has the BDAR considered the newly released mapping of important mapped areas for Plains Wanderer west of the Cobb Highway ? Michelle Patrick – this is being considered currently and will be reviewed. 2. Michelle Cox: The SAII and MNES matters are very small. Michelle Patrick: these areas are where assumed presence was applied from late footprint additions that could not be field verified or surveyed within specific survey periods.	N/A
Disturbance zones	3. Jake Manners: Will avoidance zones be established for PCT's not to be cleared under disturbance model? Request for data set snip to	N/A

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Agenda item	Notes	Decisions / actions
	demonstrate the partial clearing model application by PCT. Tuesday Heather – constraints mapping proposed which will assist detailed design/micrositing and will support the BMP to illustrate avoidance areas to contractors. Support can also be provided on how to view these zones in GIS. 4. Jake Manners – Were veg zones determined by LiDAR? Alex Cockerill– used accepted PCT heights in TBDC 5. Renee Shepherd: Attribute data tables: does the GIS layer for each PCT in the different zone show whether there is a clearing zone or no clearing zone? Michelle Patrick – correct	
Staging	Refer to attached presentation	N/A
Expert reports	6. Michelle Cox: Were expert reports done only for stage 1 area: Tuesday Heather: These were done for the whole of project as relevant for suitable habitat mapping. Expert reports for Humelink were approved for use on VNIW for Inland Slopes for Golden Sun Moth, Key's Matchstick Grasshopper, Striped Legless Lizard. Only Squirrel Glider, Brush-tailed Phascogale in Stage 2 – Report has been provided to CPHR for comment. Pink-tailed Legless Lizard habitat mapping only in Inland Slopes – expert report has concluded no suitable habitat.	NOTE – Tuesday to update the table in the presentation with PTLL expert conclusion as error shown. Correction - Pink-tailed Legless Lizard – No suitable habitat in Stage 1 Action: Transgrid to provide Pink-tailed Legless Lizard expert report to CPHR/REBS for comment.
Remote Area Access	Refer to attached presentation	N/A
Response to Submissions	Refer to attached presentation	N/A
Partial clearing	7. Renee Shepherd – How does the biodiversity sensitive areas approach work?	Action: Transgrid to organise further meeting with REBS on Partial Clearing model & verification

Agenda item	Notes	Decisions / actions
	Tuesday Heather: Commitment for constraints mapping and for construction contractor to avoid further where possible Alex Cockerill: The project has avoided a substantial amount of habitat already and these areas are the residual areas that can't be committed to as yet for full avoidance but will be avoided where possible in the next stage of detailed design and construction methodologies. 8. Renee Shepherd – Partial clearing slide: 'verification within 12 months of clearing'. REBS would be requesting earlier than this. NOTE – where possible REBS will provide consistent advice across transmission projects Transgrid/WSP - Noted 9. Michelle Cox – Regarding partial clearing a different approach to verification may apply due to different vegetation, for example chenopod ecosystem v densely wooded ecosystem etc. REBS team to discuss this item further for this project. Alex Cockerill: Under the Revised BDAR - Not applying partial impact to key forested areas (Black Box and Red Gum) - full loss assumed as stem density so high in these two vegetation classes 10. Daniel Whaite - could there be consideration of a partial impact in these areas during the clearing validation period with a view to reduce impact liability once impact is confirmed. Michelle Cox –unclear how this would work, possibly more a clearing extent conversation for project team	
Further survey	11. Tuesday Heather: Assumed presence in Stage 1. Exploring a potential opportunity for a post approval targeted survey in September to allow for removal of notable amount of	Action – Transgrid to summarise extent of assumed presence that is not related to 'no access properties' Transgrid to organise further meeting with REBS on Assumed Presence

Agenda item	Notes	Decisions / actions
	species that are assumed on a site where access has been available. Michelle Cox – Broader discussion needed, our preference is to minimise assumed presence. Suggest this be a topic of a more detailed discussion.	
BAM-C – BOS helpdesk	12. Tuesday Heather noted: Additional species in BAM-C that have been included recently. Proposed to request access to previous BAM-C version through BOS Helpdesk. Species additions include *Pterostylis pedina* and *Atriplex infrequens*. Michelle Cox - Discuss with REBS team approach to including/ addressing these.	Action: Transgrid/WSP to advise on impact of recent data import to REBS team
CPHR consultation	13. Michelle Cox - REBS is attempting to take a collaborative approach to working with proponents and assessors to achieve a BAM-compliant BDAR. This generally involves an iterative review of work to a) address issues efficiently and b) to provide confidence the proponent and consent authority that the BDAR Transgrid / WSP team to consider and advise what is possible in the program	
Next steps & discussion	14. Michelle Cox - Mitigation measure standard template is available from REBS. REBS team to provide. Transgrid/WSP team to consider adopting 15. Michelle Cox - Commonwealth consultation – have the Commonwealth been briefed recently? Alex Cockerill: the Commonwealth were briefed at the end of last year. Further consultation on EPBC referral variation to close the loop on project amendments, no change in MNES.	~~Action: REBS to provide standard Mitigation Measures~~ – PROVIDED 23/4 Action: Transgrid and WSP to provide feedback to REBS on whether the standard mitigation measures template will be adopted. Action: Transgrid to confirm the Commonwealth contact person and provide to CPHR.

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Appendix C

Matters of national environmental significance

Design
for a better
future /

Transgrid

Victoria to New South Wales Interconnector West (VNI West) (NSW)

Matters of National Environmental Significance (Revised)

June 2026

Question today
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Create for the future

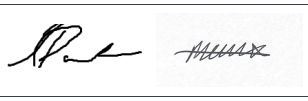
Victoria to New South Wales Interconnector West (VNI West) (NSW)
Matters of National Environmental Significance (Revised)

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Rev	Date	Details
A	27/03/2026	Draft
B	4/05/2026	Draft
C	25/05/2026	Draft
D	05/06/2026	Revised

	Name	Date	Signature
Prepared by:	Amber Garnett; Alicia Palmer; Montana Morgan	05/06/2026	
Reviewed by:	Terri-Ann English; Selga Harrington	05/06/2026	
Approved by:	Michelle Patrick	05/06/2026	

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Table of contents

Summary v

1 Introduction 1

1.1 Policy, standards and guidelines 2

2 Project 3

2.1 Project description 3

3 Methodology 5

3.1 Desktop assessment 5

3.2 Likelihood of occurrence assessment 6

3.3 Residual impact assessment 7

3.4 Field surveys 8

4 Threatened biodiversity 11

4.1 Threatened ecological communities 11

4.2 Threatened flora species 42

4.3 Threatened fauna species 44

4.4 Threatened aquatic species 47

5 Potential impacts 48

5.1 Indicative disturbance footprint 48

5.2 Direct impacts 49

5.3 Indirect impacts 53

6 Avoidance and mitigation measures 55

6.1 Avoidance 55

6.2 Mitigation measures 56

7 Threatened biodiversity assessment 73

List of tables

Table 3.1 Threatened species database searches 5

Table 3.2 Likelihood of occurrence assessment 7

Table 3.3 Summary of biodiversity survey undertaken 8

Table 4.1 Threatened Ecological Communities (TECs) within the Indicative disturbance footprint 12

Table 4.2 Assessment of EPBC Act – listed Buloke Woodlands and associated PCT 13

Table 4.3 Summary of Buloke Woodland within the Indicative disturbance footprint 15

Table 4.4 Assessment against Grey Box (*Eucalyptus microcarpa*) grassy woodlands and derived native grasslands of south-eastern Australia EPBC Act listing advice criteria 18

Table 4.5 Summary of Grey Box TEC within the Indicative disturbance footprint 21

Table 4.6 Assessment Step 1: use key diagnostic characteristics to identify if the ecological community is present for representative patches assigned to PCT 44 – Forb-rich speargrass – Windmill Grass – White Top grassland of the Riverina Bioregion 23

Table 4.7 Assessment Step 2: Determine condition of the ecological community for representative patches assigned to PCT 44 Forb-rich Speargrass – Windmill Grass – White Top grasslands of the Riverina Bioregion that meet Step 1 key diagnostic characteristics 24

Table 4.8 Assessment Step 1: use key diagnostic characteristics to identify if the ecological community is present for representative patches assigned to PCT 45 – Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion and PCT 46 – Curly Windmill Grass – speargrass – wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion 26

Table 4.9 Assessment Step 2: Determine condition of the ecological community for representative patches assigned to PCT 45 – Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion and PCT 46 – Curly Windmill Grass – speargrass – wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion that meet Step 1 key diagnostic characteristics 27

Table 4.10 Summary of Natural Grasslands TEC within the Indicative disturbance footprint 28

Table 4.11 Assessment of EPBC Act listed Plains mallee box woodland and associated recorded vegetation 30

List of tables (continued)

Table 4.12 Assessment Step 1: use key diagnostic characteristics to identify if the ecological community is present for representative patches assigned to PCT 47 – Swamp grassland wetland of the Riverine Plain....31

Table 4.13 Assessment Step 2: Determine condition of the ecological community for representative patches assigned to PCT 47 – Swamp grassland wetland of the Riverine Plain....33

Table 4.14 Analysis of Part C: Minimum wetland size for areas not subject to survey....34

Table 4.15 Summary of Seasonal Herbaceous Wetlands threatened ecological community within the indicative disturbance footprint....34

Table 4.16 Assessment of EPBC Act listed Weeping Myall Woodlands and associated recorded vegetation in PCT 26....37

Table 4.17 Summary of Weeping Myall woodlands threatened ecological community within the indicative disturbance footprint....39

Table 4.18 Assessment of PCT 266....40

Table 4.19 Assessment of PCT 277....41

Table 4.20 Summary of Box Gum Woodlands threatened ecological community within Indicative disturbance footprint....42

Table 4.21 Threatened flora likelihood of occurrence within the Indicative disturbance footprint....42

Table 4.22 Threatened fauna likelihood of occurrence within the Indicative disturbance footprint....44

Table 4.23 Threatened aquatic species likelihood of occurrence within the Indicative disturbance footprint....47

Table 5.1 Summary of amended project impacts on EPBC Act listed TECs....50

Table 5.2 Summary of amended project impacts on listed threatened flora species....51

Table 5.3 Summary of amended project impacts on listed threatened fauna species....52

Table 5.4 Summary of indirect impacts associated with the amended project....54

Table 6.1 Summary of proposed mitigation and management measures for residual impacts (direct and indirect)....56

Table 7.1 Summary of the total ecosystem credits required for EPBC threatened species and ecological communities....74

Table 7.2 Summary of the total species credits required....75

List of figures

Figure 4.1 Listing advice key characteristics and condition thresholds for Grey Box (*Eucalyptus microcarpa)* grassy woodlands and derived native grasslands of south-eastern Australia....17

Figure 4.2 Listing advice key characteristic and condition thresholds for Natural Grasslands TEC....22

Figure 4.3 Listing advice key characteristics and condition threshold criteria for Weeping Myall Woodlands....36

List of appendices

Attachment A Likelihood of occurrence

Attachment B Significance impact assessment

Summary

Summary tables for the 'Assessment of predicted impacts on EPBC Act-listed Threatened Species and Communities' and the 'Completion Checklist for BDAR Appendix E, relating to assessment of predicted impacts on EPBC Act-listed Threatened Species and Communities' are provided below in accordance with the *Guidance for Accredited Assessors on the assessment of MNES* (attachment 1 and 2) (Department of Planning Housing and Infrastructure 2016).

Table ES.1 Summary table for assessment of predicted impacts on EPBC Act-listed Threatened Species and Communities

Description of Threatened Species/ Community listed under EPBC Act	Description of PCTs associated with the ecosystem credit species/ ecological community (if applicable)	Area of predicted impact (ha)	Credits required	Credit type	Significant impact?	Offsetting approach	Nature of consequence	Duration of impact	Consequence of impact[6]	Reference to EIS and Revised BDAR[1]
Threatened ecological community										
Buloke woodlands of the Riverina and Murray Darling Depression bioregions	PCT 20 – Buloke – Moonah – Black Box open woodland on sandy rises of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	2.03	20	Ecosystem	No	Transgrid proposes to meet its biodiversity offset obligations for the amended project by retiring the required like-for-like biodiversity credits under the NSW Biodiversity Offsets Scheme, using a combination of Biodiversity Stewardship Agreements, credit purchases, and contributions to the Biodiversity Conservation Fund, as detailed in section 11.5 of the Revised BDAR.	Direct and indirect	Construction and operation	Local	Revised BDAR sections 4.2, 6.2.1, 6.2.2.1, 8, 9.1.4, 11.1, 12 and 15
Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	PCT 237 – Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone	0.59	18	Ecosystem	No		Direct and indirect	Construction and operation	Local	Revised BDAR sections 4.2, 6.2.1, 6.2.2.2, 8, 9.1.4, 11.1, 12 and 15
Natural Grasslands of the Murray Valley Plains	PCT 44 – Forb-rich Spear grass – Windmill Grass – White Top grassland of the Riverina Bioregion PCT 45 – Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW Southwestern Slopes Bioregion PCT 46 – Curly Windmill Grass – spear grass – wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion	81.05	4,722	Ecosystem	Yes		Direct and indirect	Construction and operation	Local	Revised BDAR sections 4.2, 6.2.1, 6.2.2.3, 8, 9.1.4, 11.1, 12 and 15
Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains	PCT 47 – Swamp grassland wetland of the Riverine Plain	0.19	10	Ecosystem	No		Direct and indirect	Construction and operation	Local	Revised BDAR sections 4.2, 6.2.1, 6.2.2.5, 8, 9.1.4, 11.1, 12 and 15

Description of Threatened Species/ Community listed under EPBC Act	Description of PCTs associated with the ecosystem credit species/ ecological community (if applicable)	Area of predicted impact (ha)	Credits required	Credit type	Significant impact?	Offsetting approach	Nature of consequence	Duration of impact	Consequence of impact[6]	Reference to EIS and Revised BDAR[1]
Weeping Myall Woodlands	PCT 26 – Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion	77.77	2031	Ecosystem	Yes		Direct and indirect	Construction and operation	Local	Revised BDAR sections 4.2, 6.2.1, 6.2.2.6, 8, 9.1.4, 11.1, 12 and 15
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	PCT 266 – White Box grassy woodland in the upper slopes subregion of the NSW South Western Slopes Bioregion PCT 277 – Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	2.69	97	Ecosystem	No		Direct and indirect	Construction and operation	Local	Revised BDAR sections 4.2, 6.2.1, 6.2.2.7, 8, 9.1.4, 11.1, 12 and 15
Threatened species – Flora										
Amphibromus fluitans	Habitat occurs in the Indicative disturbance footprint in the form of PCTs 11, 17 and 160.	0.72	16	Species	No	Transgrid proposes to meet its biodiversity offset obligations for the amended project by retiring the required like-for-like biodiversity credits under the NSW Biodiversity Offsets Scheme, using a combination of Biodiversity Stewardship Agreements, credit purchases, and contributions to the Biodiversity Conservation Fund, as detailed in section 11.5 of the Revised BDAR.	Direct and indirect	Construction and operation	Local	Revised BDAR sections 2.3, 2.5, 5.1.2, 5.2, 5.3, 5.4, 8, 9.1.5, 11.1.2, 12 and 15
Austrostipa metatoris	Habitat occurs in the Indicative disturbance footprint in the form of PCTs 7 and 28.	1.07	40	Species	No		Direct and indirect	Construction and operation	Local	Revised BDAR sections 2.3, 2.5, 5.1.2, 5.2, 5.3, 5.4, 8, 9.1.5, 11.1.2, 12 and 15
Austrostipa wakoolica	Habitat occurs in the Indicative disturbance footprint in the form of PCTs 17, 26, 28 and 237.	65.03	975	Species	No		Direct and indirect	Construction and operation	Local	Revised BDAR sections 2.3, 2.5, 5.1.2, 5.2, 5.3, 5.4, 8, 9.1.5, 11.1.2, 12 and 15
Brachyscome muelleroides	Habitat occurs in the Indicative disturbance footprint in the form of PCTs 44, 45, 46 and 47.	0.70	54	Species	No		Direct and indirect	Construction and operation	Local	Revised BDAR sections 2.3, 2.5, 5.1.2, 5.2, 5.3, 5.4, 8, 9.1.5, 11.1.2, 12 and 15
Brachyscome papillosa	Habitat occurs in the Indicative disturbance footprint in the form of PCTs 13, 15, 24, 44, 45, 46, 157, 159, 160, 163, 164 and 216.	146.20	6605	Species	Yes		Direct and indirect	Construction and operation	Local	Revised BDAR sections 2.3, 2.5, 5.1.2, 5.2, 5.3, 5.3.1, 5.4, 8, 9.1.5, 11.1.2, 12 and 15
Eleocharis obicis	Habitat occurs in the Indicative disturbance footprint in the form of PCTs 10, 11, 13, 17, 24, 47, 53, 157, 159, 160, 163, 164, 216 and 237.	176.16	6783	Species	Yes		Direct and indirect	Construction and operation	Local	Revised BDAR sections 2.3, 2.5, 5.1.2, 5.2, 5.3, 5.3.2, 5.4, 8, 9.1.5, 11.1.2, 12 and 15
Lepidium monoplocoides	Habitat occurs in the Indicative disturbance footprint in the form of PCTs 13, 15, 24, 26, 45, 46, 47, 159, 160, 163, 170, 216 and 237.	86.01	2935	Species	No		Direct and indirect	Construction and operation	Local	Revised BDAR sections 2.3, 2.5, 5.1.2, 5.2, 5.3, 5.3.4, 5.4, 8, 9.1.5, 11.1.2, 12 and 15

Description of Threatened Species/ Community listed under EPBC Act	Description of PCTs associated with the ecosystem credit species/ ecological community (if applicable)	Area of predicted impact (ha)	Credits required	Credit type	Significant impact?	Offsetting approach	Nature of consequence	Duration of impact	Consequence of impact[6]	Reference to EIS and Revised BDAR[1]
Maireana cheelii	Habitat occurs in the Indicative disturbance footprint in the form of PCTs 15, 23, 24, 26, 44, 46, 58, 157, 163 and 164.	169.49	6627	Species	Yes		Direct and indirect	Construction and operation	Local	Revised BDAR sections 2.3, 2.5, 5.1.2, 5.2, 5.3, 5.3.5, 5.4, 8, 9.1.5, 11.1.2, 12 and 15
Sclerolaena napiformis	Habitat occurs in the Indicative disturbance footprint in the form of PCTs 26, 44 & 46.	43.95	1121	Species	No		Direct and indirect	Construction and operation	Local	Revised BDAR sections 2.3, 2.5, 5.1.2, 5.2, 5.3, 5.4, 8, 9.1.5, 11.1.2, 12 and 15
Swainsona murrayana	Habitat occurs in the Indicative disturbance footprint in the form of PCTs 15, 17, 23, 24, 26, 28, 44, 46, 157, 163, 164 and 216.	322.47	12861	Species	No		Direct and indirect	Construction and operation	Local	Revised BDAR sections 2.3, 2.5, 5.1.2, 5.2, 5.3, 5.3.7, 5.4, 8, 9.1.5, 11.1.2, 12 and 15
Swainsona plagiotropis	Habitat occurs in the Indicative disturbance footprint in the form of PCTs 26, 44, 45 & 46.	46.12	1186	Species	No		Direct and indirect	Construction and operation	Local	Revised BDAR sections 2.3, 2.5, 5.1.2, 5.2, 5.3, 5.4, 8, 9.1.5, 11.1.2, 12 and 15
Swainsona recta	Habitat occurs in the Indicative disturbance footprint in the form of PCTs 266 & 277.	0.62	19	Species	No		Direct and indirect	Construction and operation	Local	Revised BDAR sections 2.3, 2.5, 5.1.2, 5.2, 5.3, 5.4, 8, 9.1.5, 11.1.2, 12 and 15
Threatened species – Fauna										
Crinia sloanei Sloane's Froglet	Habitat associated with PCT 237	0.59	27	Species	No	Transgrid proposes to meet its biodiversity offset obligations for the amended project by retiring the required like-for-like biodiversity credits under the NSW Biodiversity Offsets Scheme, using a combination of Biodiversity Stewardship Agreements, credit purchases, and contributions to the Biodiversity Conservation Fund, as detailed in section 11.5 of the Revised BDAR.	Direct and indirect	Construction and operation	Local	Revised BDAR sections 2.3, 2.6, 5.1.2, 5.2, 5.3, 5.4.2, 8, 9.1.5, 11.1.2, 12 and 15.
Litoria raniformis Southern Bell Frog	Habitat associated with PCTs 7, 10, 11, 13, 17, 24 and 53	34.63	880	Species	Yes		Direct and indirect	Construction and operation	Local	Revised BDAR sections 2.3, 2.6, 5.1.2, 5.2, 5.3, 5.3.13, 5.4.2, 8, 9.1.5, 11.1.2, 12 and 15.
Aphelocephala leucopsis Southern Whiteface	Habitat associated with PCTs 7, 10, 11, 13, 15, 17, 20, 23, 24, 26, 28, 44, 45, 46, 58, 157, 159, 160, 163, 164, 170, 216, 237, 266 and 277.	1251.47	33,237	Ecosystem	No		Direct and indirect	Construction and operation	Local	Revised BDAR sections 2.3, 2.6, 5.1.1, 5.2, 5.4.3, 8, 9.1.1, 11.1.1, 12 and 15.
Botaurus poiciloptilus Australasian Bittern	Habitat associated with PCTs 10, 11, 13, 17, 24 and 160.	249.4	3627	Ecosystem	No		Direct and indirect	Construction and operation	Local	Revised BDAR sections 2.3, 2.6, 5.1.1, 5.2, 5.4.3, 8, 9.1.1, 11.1.1, 12 and 15.
Calidris acuminata Sharp-tailed Sandpiper	Although not associated with any present PCTs officially, habitats present may be considered suitable based on this species diverse habitat preferences.	0.19	10[1]	Not listed in NSW	No		Direct and indirect	Construction and operation	Local	Revised BDAR sections 2.3, 2.6, 8, 9.1.1, 11.1.1, 12 and 15.

Description of Threatened Species/ Community listed under EPBC Act	Description of PCTs associated with the ecosystem credit species/ ecological community (if applicable)	Area of predicted impact (ha)	Credits required	Credit type	Significant impact?	Offsetting approach	Nature of consequence	Duration of impact	Consequence of impact[6]	Reference to EIS and Revised BDAR[1]
Climacteris picumnus victoriae Brown Treecreeper (south-eastern)	Habitat associated with PCTs 237, 266, 277 and 343.	3.33	118	Ecosystem[2]	No		Direct and indirect	Construction and operation	Local	Revised BDAR sections 2.3, 2.6, 5.1.1, 5.2, 5.4.3, 8, 9.1.1, 11.1.1, 12 and 15.
Falco hypoleucos *Grey Falcon*	Habitat associated with PCTs 10, 11, 13, 15, 17, 20, 22, 23, 24, 26, 28, 44, 45, 46, 47, 58, 157, 159, 160, 163, 164, 166, 170, 216 and 237.	1230.47	33,010	Ecosystem	No		Direct and indirect	Construction and operation	Local	Revised BDAR sections 2.3, 2.6, 5.1.1, 5.2, 5.4.3, 8, 9.1.1, 11.1.1, 12 and 15.
Gallinago hardwickii Latham's Snipe	Habitat associated with PCTs 7, 10, 11, 13, 15, 17, 20, 28, 44, 86, 160, 163, 164, 216 and 237.	277.2	4038	Ecosystem	No		Direct and indirect	Construction and operation	Local	Revised BDAR sections 2.3, 2.6, 5.1.1, 5.2, 5.4.3, 8, 9.1.1, 11.1.1, 12 and 15.
Grantiella picta Painted Honeyeater	Habitat associated with PCTs 7, 10, 11, 13, 15, 20, 23, 26, 28, 58, 86, 237, 266, 277, 319 and 343.	382.52	9326	Ecosystem[2]	No		Direct and indirect	Construction and operation	Local	Revised BDAR sections 2.3, 2.6, 5.1.1, 5.2, 5.4.3, 8, 9.1.1, 11.1.1, 12 and 15.
Hirundapus caudacutus White-throated Needletail	Habitat associated with PCTs 7, 10, 11, 13, 15, 17, 24, 26, 44, 45, 46, 47, 157, 160, 216, 237, 266, 277, 319 and 343.	819.70	19309	Ecosystem	No		Direct and indirect	Construction and operation	Local	Revised BDAR sections 2.3, 2.6, 5.1.1, 5.2, 5.4.3, 8, 9.1.1, 11.1.1, 12 and 15.
Lathamus discolor Swift Parrot	Habitat associated with PCTs 7, 10, 11, 13, 15, 24, 26, 86, 237, 266, 277, 319 and 343	373.93	9182	Dual[2 &3]	No		Direct and indirect	Construction and operation	Local	Revised BDAR sections 2.3, 2.6, 5.1.1, 5.1.2, 5.2, 5.3, 5.4.2, 5.4.3, 8, 9.1.1, 9.1.5, 11.1.1, 11.1.2, 12 and 15.
Lophochroa leadbeateri Pink Cockatoo	Habitat associated with PCTs 7, 10, 11, 13, 15, 20, 23, 26, 28, 45, 58, 159, 163, 170 and 237.	43.72	1118	Dual[4]	No		Direct and indirect	Construction and operation	Local	Revised BDAR sections 2.3, 2.6, 5.1.1, 5.1.2, 5.2, 5.3, 5.3.10, 5.4.2, 5.4.3, 8, 9.1.1, 9.1.5, 9.2.3, 11.1.1, 11.1.2, 12 and 15.
Melanodryas cucullata cucullata Hooded Robin (south-eastern form)	Habitat associated with PCTs 7, 10, 11, 13, 15, 20, 23, 26, 28, 58, 86, 170 237, 266, 277, 319 and 343.	659.92	10416	Ecosystem	No		Direct and indirect	Construction and operation	Local	Revised BDAR sections 2.3, 2.6, 5.1.1, 5.2, 5.4.3, 8, 9.1.1, 11.1.1, 12 and 15.
Neophema chrysostoma Blue-winged Parrot	Habitat associated with PCTs 7, 11, 13, 15, 17, 24, 26, 28, 44, 45, 46, 58, 157, 160, 163, 164, 170 and 216.	1185.99	32373	Ecosystem	No		Direct and indirect	Construction and operation	Local	Revised BDAR sections 2.3, 2.6, 5.1.1, 5.2, 5.4.3, 8, 9.1.1, 11.1.1, 12 and 15.
Pedionomus torquatus Plains-wanderer	Habitat associated with PCTs 44 and 46.	78.5 (0.95 ha as species credit & 77.55 ha as ecosystem credit)	4601 (55 species credits & 4546 ecosystem credits)	Dual[5]	No		Direct and indirect	Construction and operation	Local	Revised BDAR sections 2.3, 2.6, 5.1.1, 5.1.2, 5.2, 5.3, 5.3.11, 5.4.2, 5.4.3, 8, 9.1.1, 9.1.5, 11.1.1, 11.1.2, 12 and 15.

Description of Threatened Species/ Community listed under EPBC Act	Description of PCTs associated with the ecosystem credit species/ ecological community (if applicable)	Area of predicted impact (ha)	Credits required	Credit type	Significant impact?	Offsetting approach	Nature of consequence	Duration of impact	Consequence of impact[6]	Reference to EIS and Revised BDAR[1]
Polytelis swainsonii Superb Parrot	Habitat associated with PCTs 7, 10, 11, 13, 26, 237, 266, 277 and 343.	1.08	39	Dual[4]	No		Direct and indirect	Construction and operation	Local	Revised BDAR sections 2.3, 2.6, 5.1.1, 5.1.2, 5.2, 5.3, 5.3.15, 5.4.2, 5.4.3, 8, 9.1.1, 9.1.5, 11.1.1, 11.1.2, 12 and 15.
Rostratula australis Australian Painted Snipe	Habitat associated with PCTs 7, 10, 11, 13, 17, 24, 47, 53 and 160.	254.72	3786	Ecosystem	No		Direct and indirect	Construction and operation	Local	Revised BDAR sections 2.3, 2.6, 5.1.1, 5.2, 5.4.3, 8, 9.1.1, 11.1.1, 12 and 15.
Stagonopleura guttata Diamond Firetail	Habitat associated with PCTs 7, 10, 11, 13, 20, 23, 26, 28, 44, 45, 46, 58, 86, 170, 237, 266, 277, 319 and 343.	648.17	12731	Ecosystem	No		Direct and indirect	Construction and operation	Local	Revised BDAR sections 2.3, 2.6, 5.1.1, 5.2, 5.4.3, 8, 9.1.1, 11.1.1, 12 and 15.
Tringa nebularia Common Greenshank	Although not associated with any present PCTs officially, habitats present may be considered suitable based on this species diverse habitat preferences.	0.19	10[1]	Ecosystem	No		Direct and indirect	Construction and operation	Local	Revised BDAR sections 2.3, 2.6, 8, 9.1.1, 11.1.1, 12 and 15.
Nyctophilus corbeni Corben's Long-eared Bat	Habitat associated with PCTs 10, 28, 86 and 266.	38.59	319	Ecosystem	No		Direct and indirect	Construction and operation	Local	Revised BDAR sections 2.3, 2.6, 5.1.1, 5.2, 5.4.3, 8, 9.1.1, 11.1.1, 12 and 15.
Phascolarctos cinereus Koala	Habitat associated with PCTs 7, 10, 11, 13, 15, 17, 20, 23, 24, 26, 28, 53, 58, 86, 157, 159, 160, 170, 216, 237, 266, 277, 319, 343 and 346.	138.41	3673	Species	No		Direct and indirect	Construction and operation	Local	Revised BDAR sections 2.3, 2.6, 5.1.2, 5.2, 5.3, 5.4.2, 8, 9.1.5, 11.1.2, 12 and 15.

(1) These species are not associated within any PCTs. They are known to use wetland habitats including riparian areas but may also use the grassland habitat. For the purpose of this assessment the credits are based on PCT 47 Swamp grassland wetland of the Riverine Plain.

(2) Species is known to only inhabit woodland vegetation and has been restricted to areas of treed vegetation (i.e. derived condition classes have been removed from assessment as they are not considered suitable habitat for the species.

(3) Species is listed as a dual credit species in NSW. However, no candidate species credit liability for the species has been identified by the Revised BDAR and the species has been assessed as an Ecosystem credit species only for MNES matters.

(4) Species is listed as a dual credit species in NSW. However, the species has been assessed for breeding habitat only for MNES matters (i.e. the species is assessed as a candidate species only).

(5) Species is listed as a dual credit species in NSW. However, the species has been given species provisions as has been assessed for impacts as both a species and ecosystem credit for MNES matters.

(6) Consequence of impact where; Local – consequence is confined to the project area or nearby occurrence/habitat, State – consequence affects the species, population or community extent at the NSW scale and National – consequence affects the species, population or community extent at the national scale

Table ES.2 Completion checklist for Revised BDAR, relating to assessment of predicted impacts on EPBC Act-listed Threatened Species and Communities

Initial when complete	Information required to be included in Appendix C	Comments
Part A		
Confirm that general information in Appendix C (MNES) of the Revised BDAR is complete/sufficient		
X	Appendix C clearly shows how operational and construction footprints, including clearing boundaries, structures to be built and elements of the action, are situated with regard to MNES (and/or references to where this detail is provided within the body of the Revised BDAR).	Information on the spatial relationship between the amended project's construction and operational footprints (including clearing boundaries, infrastructure locations and elements of the action) and MNES is provided in Appendix C, with supporting detail in sections 1.2, 1.2.4, and Chapter 6, and mapped in Chapter 15 (Figures) of the Revised BDAR.
X	Appendix C includes a map(s) of the Indicative disturbance footprint boundary showing the proposal/disturbance footprint with respect to location of MNES, including links to or directory locations of GIS shape files (and/or references to where this detail is provided within the body of the Revised BDAR).	Mapping showing the Indicative disturbance footprint boundary, proposal/disturbance footprint and clearing extents are provided in sections 1.2 and 1.2.4, the MNES assessment in Chapter 6, and mapped figures in Chapter 15 of the Revised BDAR.
X	Appendix C identifies any other site constraints in selecting the location and design of the proposed development (such as bushfire protection requirements, flood planning levels, servicing constraints) (and/or references to where this detail is provided within the body of the Amended EIS or Revised BDAR).	Project siting constraints and design alternatives considered are discussed in Appendix C, section 2 (Project). References to relevant sections in Revised BDAR section 1.1 and 1.2.
X	Appendix C clearly depicts stages and timing of the action that may impact on MNES (and/or references to where this detail is provided within the body of the BDAR).	The timing and staging of the action relevant to MNES are addressed in Appendix C, section 2.1.2 and section 6, by reference to the amended project description and staging outlined in Sections 1.2.2–1.2.4 of the Revised BDAR, which describe the construction and operational phases during which impacts may occur.
X	The Revised BDAR Declarations (Section i) include an explicit statement that all EPBC Act listed threatened species and communities that occur on the Indicative disturbance footprint, or in the vicinity, have been identified in the Revised BDAR/EIS including those that are ecosystem credit species.	Provided in Revised BDAR Declarations (Section i). Also included in Appendix C, section 1 (Introduction).
X	Appendix C contains a completed Summary Table	This summary table has been included as part of Appendix C.
X	Appendix C contains sufficient general information regarding the amended project's predicted impact on MNES.	Impacts are discussed in detail in Appendix C, section 5 (Potential impacts) with residual impacts after mitigations discussed in Appendix C, section 7 (Threatened biodiversity assessment). Further detail is provided in the Revised BDAR which are referenced in Appendix C, this is consistent with *Guidance for Accredited Assessors on the Assessment of Matters of National Environmental Significance* (Department of Planning Housing and Infrastructure 2016).
X	Appendix C contains (or references) a separate assessment for each threatened species and community that occurs on or near the site (containing minimum information requirements).	Provided in Appendix C, Attachment B (Significant impact assessment). Further detail is provided in the Revised BDAR which are referenced in Appendix C, this is consistent with *Guidance for Accredited Assessors on the Assessment of Matters of National Environmental Significance* (Department of Planning Housing and Infrastructure 2016).
X	Appendix C contains appropriate analysis and justification for any species and communities identified in the referral documentation (provided by the Australian Government) that have been ruled out because they don't occur on or near the site.	Provided in Appendix C, section 4.1 and 4.3 and Attachment A (Likelihood of occurrence). Further detail is provided in the Revised BDAR which are referenced in Appendix C, this is consistent with *Guidance for Accredited Assessors on the Assessment of Matters of National Environmental Significance* (Department of Planning Housing and Infrastructure 2016).
X	Appendix C identifies any relevant Commonwealth guidelines and policy statements applicable to the proposed development, including but not limited to: — international environmental obligations — Recovery Plans — Approved Conservation Advice, and — Threat Abatement Plans.	Provided in Appendix C, Attachment B (Significant impact assessment), with applicable Commonwealth guidelines and policy statements listed as part of the assessment for each TEC or threatened species.

Initial when complete	Information required to be included in Appendix C	Comments
X	Appendix C includes relevant information on the identification of [name of the species/community] on the site or in the vicinity via: — field based survey effort — published peer reviewed literature — local data, and — supporting databases (such as the NSW BioNet Vegetation Classification, NSW BioNet Threatened Biodiversity Data Collection, NSW BioNet Atlas, Commonwealth Species Profile and Threats Database search results).	Summarised in Appendix C, section 4 (Threatened biodiversity) with identification methods provided in Appendix C, Attachment A (Likelihood of occurrence) and additional detail for each threatened entity provided in the assessments in Appendix C, Attachment B (Significant impact assessment). Additional detail is provided in the which is referenced in Appendix C, this is consistent with *Guidance for Accredited Assessors on the Assessment of Matters of National Environmental Significance* (Department of Planning Housing and Infrastructure 2016).
X	Appendix C includes appropriate mapping of [species/community] in accordance with the relevant Commonwealth Listing Advice.	Appendix C sections contain references to Revised BDAR figures for MNES Section 15 (Figures). This is consistent with *Guidance for Accredited Assessors on the Assessment of Matters of National Environmental Significance* (Department of Planning Housing and Infrastructure 2016).
X	Appendix C includes consideration of important populations and critical habitat as defined in Approved Listing Advice, Approved Conservation Advice, Threat Abatement Plans and Recovery Action Plans that relate to [species/community].	Important populations and critical habitat relevant to each threatened entity are discussed in detail in Appendix C, Attachment B (Significant impact assessment).
X	Appendix C identifies feasible alternatives and efforts to avoid and minimise predicted impacts on [species/community] (including direct, indirect and prescribed impacts) including an analysis of the following alternatives: — designs and engineering solutions — modes or technologies — routes and locations of facilities, and — sites within the subject site.	Chosen project design and alternatives are discussed in Appendix C, section 2 (Project). Mitigation measures to minimise impacts are discussed in Appendix C, section 6.2 (Mitigation measures). Specific impacts and efforts to avoid and minimise impacts for each threatened entity are discussed in Appendix C, Attachment B (Significant impact assessment). Additional detail is provided in the which is referenced in Appendix C, this is consistent with *Guidance for Accredited Assessors on the Assessment of Matters of National Environmental Significance* (Department of Planning Housing and Infrastructure 2016).
X	Appendix C identifies feasible measures to mitigate and/or manage predicted impacts on [species/community] (including direct, indirect and prescribed impacts) including: — techniques, timing, frequency and responsibility — identify measures for which there is a risk of failure — evaluate the risk and consequence of any residual impacts, and — any adaptive management strategy proposed to monitor and respond to impacts.	Impacts on threatened entities and measures to mitigate and manage impacts are discussed in detail in Appendix C, section 5 (Impacts) and Appendix C, section 6 (Avoidance and mitigation measures). Any specific measures for threatened entities discussed in Appendix C, Attachment B (Significant impact assessment). Further detail is provided in the which is referenced in Appendix C, this is consistent with *Guidance for Accredited Assessors on the Assessment of Matters of National Environmental Significance* (Department of Planning Housing and Infrastructure 2016).
X	Appendix C identifies the residual adverse impacts likely to occur to [species/community] after the proposed avoidance and mitigation measures are taken into account, including: — nature and consequences of impacts (i.e. direct and indirect) — duration of impact (e.g. construction, operation, life of project) — quantum of impact, and — consequences of impacts on the species, the population and/or extent of the community at local, state and national scales.	Provided in Appendix C, section 7 (Threatened biodiversity assessment). Specific impact assessment and consequences for each threatened entity are provided in Appendix C, Attachment B (Significant impact assessment).
X	Appendix C identifies the level of predicted residual impact and provides adequate justification and evidence for the predicted level of impact, with reference to the Commonwealth's Significant Impact Guideline. Note. This will mean that the level of predicted impact is described as either: — high likelihood of significant residual impact (requiring offsets) or — low likelihood of significant residual impact (not requiring offsets).	Summary of predicted residual impact provided in Appendix C, section 7 (Threatened biodiversity assessment). Evidence and justifications for residual impact to each threatened entity are provided in Appendix C, Attachment B (Significant impact assessment).

Initial when complete	Information required to be included in Appendix C	Comments
X	Appendix C identifies plans for offsetting, including: — whether the MNES has been offset using the BAM — how impacts requiring offsets correlate to MNES impacts — whether ecological rehabilitation and/or biodiversity conservation actions are proposed for offsetting, and — whether any other offsetting approach is proposed, such as land-based offsets, retiring credits by payment into the Biodiversity Conservation Fund and/or through supplementary measures.	Summary of offsetting requirements in regard to MNES is provided in Appendix C, section 7 (Threatened biodiversity assessment). Further detail is provided in the which is referenced in Appendix C, this is consistent with *Guidance for Accredited Assessors on the Assessment of Matters of National Environmental Significance* (Department of Planning Housing and Infrastructure 2016).
X	Appendix C identifies the number and type of (species/ecosystem) credits required for predicted residual adverse impacts to MNES.	Provided in Appendix C, section 7 (Threatened biodiversity assessment).
X	Appendix C contains an explicit statement that confirms that the BAM (and BAM calculator) has been used correctly to identify the number and class of biodiversity credits that need to be offset to achieve a standard of 'no net loss' of biodiversity.	Revised BDAR Declarations (Section i), with supporting credit calculations presented in Chapters 11 and 12 and Appendix E of the Revised BDAR.

1 Introduction

The Environmental Protection and Biodiversity Conservation Act (EPBC Act) establishes a requirement for Commonwealth environmental assessment and approval for actions that are likely to have a significant impact on any matters of national environmental significance (MNES) protected under the EPBC Act, including:

- world heritage properties
- national heritage places
- wetlands of international importance (listed under the Ramsar convention)
- listed threatened species and ecological communities
- migratory species
- Commonwealth marine areas
- the Great Barrier Reef marine park
- nuclear actions (including uranium mines)
- a water resource, in relation to coal seam gas development and large coal mining development.

Other matters protected under the EPBC Act include the environment where:

- actions proposed are on, or will affect Commonwealth land and the environment
- Commonwealth agencies are proposing to take an action.

When a proponent proposes to take an action that they believe may need approval under the EPBC Act, they must refer the project to the Australian Government Minister for the Environment (the Minister). The purpose of the referral is to determine whether a project requires further assessment and approval under the EPBC Act.

A referral for New transmission infrastructure – Victoria NSW Interconnector – West (NSW) (EPBC 2024/09871) (referred to as 'the project' or 'VNI West (NSW)') was submitted to the Commonwealth Minister for the Environment (Minister), and determined a controlled action on the 4 September 2024 (DCCEEW, 2024) due to likely impacts on listed threatened species and communities (sections 18 & 18A). The delegate for the Minister also confirmed that the project would be assessed by Environment Impact Statement (EIS) under a bilateral agreement between the Australian Government and the State of New South Wales (in accordance with section 45 of the EPBC Act).

An EIS was prepared to support Transgrid's application for approval of VNI West (NSW) in accordance with the requirements of Part 5, Division 5.2 of the *NSW Environmental Planning and Assessment Act 1979* (EP&A Act). The EIS was placed on public exhibition by the NSW Department of Planning, Housing and Infrastructure (NSW DPHI) for a period of 28 days between 1 August 2025 and 29 August 2025.

Transgrid has identified several proposed amendments and refinements to the EIS project that reflect functional improvements to the design and construction methodology. The amendments and refinements have been made in response to feedback received from landholders and other key stakeholders; ongoing discussion with EnergyCo regarding infrastructure requirements to support the South West REZ and greater clarity regarding the announced delay to the VNI West (Victoria) project in July 2025. The project, inclusive of the proposed amendments and refinements, is referred to as the 'amended project' and is the subject of this amended MNES.

This appendix accompanies the Revised Biodiversity Development Assessment Report (Revised BDAR) and the Amendment Report for the VNI West (NSW). It addresses the Secretary's Environmental Assessment Requirements (SEARs), issued on 4 October 2024 and supplementary SEARs on 22 May 2025, and *Guidelines for Preparing Assessment Documentation Relevant to the Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) for proposals assessed under the NSW Assessment Bilateral Victoria NSW Interconnector West Project (NSW) (EPBC 2024/09871) (EPBC Guidance). This appendix has been prepared to support assessment under the

NSW Assessment Bilateral and identifies the relevant EPBC Act listed threatened species and ecological communities, assesses the likely impacts on those protected matters, documents the proposed avoidance and mitigation measures, and sets out the residual impacts and offset requirements for any significant residual impacts. Table ES.2 provides a cross-reference to where the information required for the bilateral assessment is addressed in this appendix and the Revised BDAR. This assessment should be read in conjunction with the Revised BDAR and the Amendment Report.

In line with the *Guidance for Accredited Assessors on the Assessment of Matters of National Environmental Significance* (DPHI, 2016) (the Guidance Note) document, this MNES Appendix references the detailed information contained in the Revised BDAR and Amendment Report rather than reproducing it. This approach is consistent with NSW guidelines and avoids unnecessary duplication while meeting the requirement SEARs and the EPBC Act Guidance is addressed.

1.1 Policy, standards and guidelines

Policy, standards and guidelines applied to the assessment of MNES include:

- Significant Impact Guidelines 1.1 – Matters of National Environmental Significance (Significant Impact Guideline) (DoE, 2013a).
- Significant Impact guidelines 1.2 – Actions on, or impacting upon, Commonwealth Land and actions by Commonwealth agencies (DoE, 2013b)
- Relevant listing advice(s), conservation advice(s), recovery plan(s) and threat abatement plan(s) from the Department of Climate Change, Energy, the Environment and Water (DCCEEW) Species Profile and Threats Database (SPRAT) for the relevant listed threatened species and ecological communities assessed (Commonwealth of Australia). These documents are referenced in the species profiles (Attachment B) and have been considered in the Significant Impact Assessments (SIAs).

2 Project

2.1 Project description

Transgrid and VicGrid 'VNI West' (formerly Transmission Company Victoria) are jointly developing a new electrical connection between NSW and Victoria called the Victoria to NSW Interconnector West project (VNI West). VNI West would form a second transmission link between NSW and Victoria to harness clean, low-cost electricity from Renewable Energy Zones (REZs) in both states and improve the reliability and security of electricity supply. VNI West is a priority project for the Australian Energy Market Operator (AEMO) and the Commonwealth and NSW and Victorian governments.

VNI West proposes the construction, operation and ongoing maintenance of a high voltage, 500 kV double circuit overhead transmission line that would connect the high voltage electricity grids in NSW and Victoria. Specifically, VNI West would connect the Western Renewables Link proposal at Bulgana in Victoria with the EnergyConnect (NSW – Eastern section) project (SSI-9172452) at the Dinawan substation in NSW. The connection would be made via a new substation near Kerang in Victoria. Transgrid is responsible for seeking the required planning approval and delivering the NSW component of VNI West (referred to as 'VNI West (NSW)').

VNI West (NSW) would be located across four local government area (LGAs) which consist of the following: Edward River, Murray River, Murrumbidgee, and Wagga Wagga LGAs.

An EIS was prepared to support Transgrid's application for approval of VNI West (NSW) in accordance with the requirements of Part 5, Division 5.2 of the *NSW Environmental Planning and Assessment Act 1979* (EP&A Act). The EIS was placed on public exhibition by the NSW Department of Planning, Housing and Infrastructure (NSW DPHI) for a period of 28 days between 1 August 2025 and 29 August 2025.

Transgrid has identified several proposed amendments and refinements to the EIS project that reflect functional improvements to the design and construction methodology. The amendments and refinements have been made in response to feedback received from landholders and other key stakeholders; ongoing discussion with EnergyCo regarding infrastructure requirements to support the South West REZ and greater clarity regarding the announced delay to the VNI West (Victoria) project in July 2025. The project, inclusive of the proposed amendments and refinements, is referred to as the 'amended project' and is the subject of this revised technical report.

This appendix should be read in conjunction with the Revised BDAR in particular:

- Chapter 1 – Introduction and project description
- Chapter 2 – Methodology
- Chapters 3 and 4 – Site context including vegetation communities
- Chapter 5 – Habitat suitability and presence of threatened (candidate) species
- Chapter 8 – Avoidance and mitigation measures
- Chapters 9 to 11 – Impact assessment and summary
- Chapter 12 – Biodiversity credit report.

2.1.1 Location

The amended project is located in southern New South Wales, extending from the NSW/Victorian border through the Riverina region, with minor network augmentation works occurring within the NSW South Wales Western Slopes to the south of Wagga Wagga.

The Amended Project Footprint comprises two disjointed transmission corridors associated with the NSW component of the Victoria–NSW Interconnector West project. These corridors extend between the NSW/Victorian border and Dinawan Substation, and between Ivydale Road at Gregadoo and the future Gugaa 500 kV substation. The future Gugaa 500 kV substation itself is subject to a separate planning approval and is not included within the amended project footprint assessed in this report.

The amended project intersects three Interim Biogeographic Regionalisation for Australia (IBRA) subregions: the Murray Fans, Murrumbidgee, and Inland Slopes subregions. The location of the amended project is shown in Figure 1.1 Location Map and Figure 1.2 Site Map of the Revised BDAR.

2.1.2 Timing and sequencing

Construction of the project was anticipated to commence in mid-2027, subject to NSW Government and Commonwealth planning approvals, and was expected to take around two years to complete. With the staged approach in the Amendment Report, the total timing will be longer in duration:

- Stage 1 – including initial early works and construction of the Dinawan substation expansion and network augmentation works commencing in mid-2027.
- Stage 2 – including construction of the NSW/Victorian border to Dinawan substation component of the 500 kV transmission line and the installation of additional new shunt reactors at the existing Wagga 330 kV substation commencing in mid-2028.

As a result of the split commencement and proposed staging of construction, construction works are expected to be completed over a total period of around 42 months (inclusive of both Stage 1 and Stage 2).

2.1.3 Key definitions

The following terms are defined as they are used in the Revised BDAR and are included to ensure alignment between the Revised BDAR and this MNES assessment.

Amended project footprint	The area that has been assumed for the purpose of the Amendment Report to be directly affected by the construction and operation of the amended project. It includes the indicative location for amended project infrastructure, the area that would be directly disturbed during construction and easement requirements for operation. The amended project footprint has been developed to achieve a level of flexibility for future design refinement.
Indicative disturbance footprint	Refers to the indicative footprint that would be temporarily or permanently cleared during the construction of amended project comprising the following: – locations of all amended project infrastructure elements (including the proposed transmission line, transmission line easement, substation works (at the Dinawan, existing Wagga 330 kV and future Gugaa 500 kV substations), telecommunication facilities, and other ancillary works) – locations for construction elements such as construction compounds and temporary worker accommodation facilities, access tracks (excluding public roads proposed to be used for access tracks), site access points, water supply points, laydown and staging areas, concrete batching plants, brake and winch sites and site offices. The area is identified based on realistic amended project component locations and areas however it is indicative at this stage. The final disturbance area would be confirmed during finalisation of the design and construction methodology and would be developed as part of the consideration of avoidance and impact minimisation. This indicative disturbance footprint includes areas required for operation and maintenance.

3 Methodology

The MNES assessment was undertaken in accordance with the NSW Biodiversity Assessment methods (BAM) and the requirements of the *BAM Operational Manual – Stage 1* (Department of Planning, Industry and Environment, 2020). This section provides a summary of the methodology with further detail provide in Section 2 of the Revised BDAR.

3.1 Desktop assessment

In accordance with the BAM, a desktop assessment was undertaken to inform the identification of threatened species and ecological communities with the potential to occur within the amended project footprint. The BAM requires the accredited assessor to review available information about threatened species to determine if any predicted or candidate species inclusions are required.

As part of the desktop assessment, searches of the threatened species databases were undertaken, For the purpose of this assessment, the term database searches include all the databases presented in Table 3.1, unless otherwise stated.

Table 3.1 Threatened species database searches

Database	Search date	Area searches	Reference
PlantNet Database	March 2024 – March 2026	Locality search	Royal Botanic Gardens and Domain Trust
BioNet Atlas of NSW Wildlife	September 2023 – April 2026	The locality search was completed to 10 km for the three IBRA subregions, as well as ongoing TBDC searches for survey planning, associated habitat and species polygons. The three IBRA sub-regions include — Murrumbidgee — Murray Fans — Inland Slopes.	Threatened Biodiversity Data Collection (TBDC) 2026
EPBC Protected Matters Search Tool	May 2025 – April 2026	10 km search around project corridor	Commonwealth DCCEEW 2026e
Biodiversity Assessment Method (BAM) Calculator (Credit Calculator)	Final updates in BAM-C April 2026	The following IBRA subregions: — Murrumbidgee — Murray Fans — Inland Slopes.	BAM-C Version 94 OEH 2026
NSW Department of Primary Industries (Fishing and Aquaculture) threatened Aquatic Fauna Database	April 2026	Local government areas: — Edward River LGA — Murray River LGA — Murrumbidgee LGA — Wagga Wagga LGA.	Department of Primary Industries and Regional Development, n.d.

In addition to database searches, a range of existing information and literature relevant to threatened biodiversity and native vegetation was reviewed to inform the desktop assessment. This included:

- NSW Sharing and Enabling Environmental Data (SEED) portal (NSW Government 2021)
- DAWE's Directory of Important Wetlands (Department of Agriculture Water and the Environment 2021)
- Existing BDARs:
  - EnergyConnect (NSW – Eastern section) project comprises the construction and operation of new high voltage transmission lines between the existing Buronga and Wagga Wagga substations, a new substation (Dinawan), and upgrade and expansion of existing infrastructure. The proposed corridor is around one kilometre wide and 537 kilometres long and is located in western NSW (WSP, 2022).
  - Yanco Delta is a 1.5-gigawatt (GW) wind farm and 800 MW battery project to be located in the South-West REZ in NSW with expected contract award in 2025. It is located at the eastern end of the NSW/Victoria border to Dinawan Substation section of the alignment, where the Indicative disturbance footprint intersects the amended project north of the township of Moonbria along Mabins Well Road (Virya Energy, 2022).
  - Dinawan Wind Farm – East is a 1.5 GW wind farm to be located in the South West REZ in NSW with expected construction commencement in 2025. It is located at the eastern end of the NSW/Victoria border to Dinawan Substation section of the alignment, located halfway between the towns of Coleambally and Jerilderie where the Indicative disturbance footprint intersects the amended project along Mabins Well Road (Spark Renewables, 2024).
  - Dinawan Solar Farm is an 800 MW solar and 300 MW battery project to be located in the South-West REZ in NSW with expected construction commencement in 2025. It is located at the very tip of the eastern end of the NSW/Victoria border to Dinawan Substation section of the alignment, and borders the Dinawan Wind Farm – East project, where it intersects the Indicative disturbance footprint at the site of the proposed Dinawan substation (Spark Renewables, 2023).
  - HumeLink involves the construction of a substation east of Wagga Wagga as well as connections to existing substations at Wagga Wagga and Bannaby and a future substation in Gregadoo (i.e. Gugaa substation (Transgrid 2023). VNI West runs along the section of the Humelink alignment between the existing Wagga substation and the future Gugaa substation, nearby the township of Gregadoo.

A list of the documents and literature reviewed as part of the desktop assessment is provided in sections 2.3.2, 2.5.1 and 2.6.1 of the Revised BDAR.

3.2 Likelihood of occurrence assessment

Listed threatened species and ecological communities identified in the desktop assessment (sections 2.3.1, 2.3.2, 2.5.1 & 2.6.1 of the Revised BDAR) were assessed for likelihood of occurrence against the criteria outlined in Table 3.2.

Field surveys and habitat assessments were also utilised to inform the likelihood of occurrence assessment. Assessments were based on the habitat profile for the species and other habitat information in the Threatened Biodiversity Data Collection (TBDC), the Species Profile and Threats Database (DPE 2025a), and relevant approved conservation advice and recovery plans.

Table 3.2 Likelihood of occurrence assessment

Likelihood of occurrence	Criteria
Low	Have not been recorded previously in the amended project site and surrounds and/or the amended project site is beyond the current known geographic range of the species. Are dependent on specific habitat types or resources that are not present. Are considered extinct in the locality.
Moderate	Have been recorded previously in the amended project site and surrounds infrequently (i.e., vagrant individuals). Use habitat types or resources that are present, although generally in a poor or modified condition. Are unlikely to maintain sedentary populations, however, may seasonally utilise available resources opportunistically during variable seasons or migration.
High	Have been recorded previously within the amended project site. Are dependent on habitat types or resources that are abundant and/or in good condition. Are known or likely to maintain resident populations within/surrounding the amended project site. Are known or likely to visit during regular seasonal movements or migration.
Recorded	Have been recorded within the amended project site during surveys.

A risk assessment was also applied to listed threatened species to determine if further assessment was required. The risk assessment is based on the potential extent of habitat loss resulting from the amended project, and considers the following:

- the value of the impacted habitat to each respective species
- the amount of habitat to be lost against that to be retained
- potential fragmentation of a population into two or more populations
- increased fragmentation of wildlife corridors traversing the Indicative disturbance footprint
- risk of operational impacts
- each species ability (e.g. fauna) or inability (e.g. flora) to move away from areas of direct impact into retained habitats.

The likelihood of occurrence assessment is provided in Attachment A.

3.3 Residual impact assessment

Residual impacts are impacts of the amended project that may remain after the mitigation measures have been considered. The residual significant impact was determined by applying the relevant significant impact criteria set out in the *Significant Impact Guidelines (1.1)* to listed threatened species and ecological communities that were either recorded within the Indicative disturbance footprint or identified as having a moderate to high likelihood of occurrence.

The following factors have been considered in assessing the residual impacts on the environment and listed threatened species and ecological communities:

- nature of the impacts such as direct, indirect, cumulative and facilitated
- magnitude of the impact, taking into account the severity and scale of the impact when compared with baseline condition timing, duration and frequency of the impact (temporary or permanent) and the extent of habitat resources within the immediate vicinity of the Indicative disturbance footprint
- likelihood that any given impact would occur
- whether any impacts are unknown, unpredictable or irreversible.

3.4 Field surveys

The survey program was designed and implemented to meet the requirements of the BAM and to be consistent with the survey expectations of the EPBC Act. Survey design was informed by desktop assessment and targeted field investigations, with effort tailored to the linear nature of the amended project and the diversity of habitats present within the amended project corridor and associated disturbance footprint.

Surveys were planned having regard to habitat suitability, likelihood of occurrence of EPBC-listed species and ecological communities, detectability and seasonal constraints. Where survey limitations applied, precautionary assumptions were adopted consistent with Commonwealth guidance.

A summary of the surveys undertaken is provided in Table 3.3, with detailed methodology presented in the section 2.2 (native vegetation and threatened ecological communities), section 2.5 (threatened flora), section 2.6 (threatened fauna), and section 2.8 (aquatic habitats) of the Revised BDAR.

Table 3.3 Summary of biodiversity survey undertaken

Survey type	Target biodiversity values	Survey design considerations	Survey extent	Relevant Revised BDAR sections
Native vegetation and TEC surveys	Native vegetation communities and threatened ecological communities (including EPBC-listed TECs)	Habitat extent, condition, detectability and seasonal constraints, consistent with the BAM	Indicative disturbance footprint and relevant assessment buffers	Section 2.2
Threatened flora surveys	EPBC-listed threatened flora with moderate to high likelihood of occurrence	Habitat suitability, flowering periods, detectability and access constraints	Habitat-suitable areas within the Indicative disturbance footprint	Section 2.5
Threatened fauna surveys	EPBC-listed threatened terrestrial and aquatic fauna	Habitat suitability, species ecology, detectability and seasonal constraints	Indicative disturbance footprint and appropriate buffers	Section 2.6
Habitat assessments and targeted investigations	Habitat suitability for EPBC-listed species and ecological communities	Desktop review and field verification to inform likelihood of occurrence and survey effort	Indicative disturbance footprint and surrounding landscape context	Sections 2.3, 2.6–2.7

3.4.1 Survey guidelines

The survey methodology was developed having regard to relevant Commonwealth and NSW survey guidelines, as applicable to EPBC-listed flora, fauna and aquatic biodiversity values with potential to occur within the amended project area, including:

- Survey guidelines for Australia's threatened birds (DoE, 2010a)
- Survey guidelines for Australia's threatened bats (DoE, 2010b)
- Survey guidelines for Australia's threatened frogs (DoE, 2010c)
- Survey guidelines for Australia's threatened reptiles (DSEWPaC, 2011c)
- Survey guidelines for Australia's threatened mammals (DSEWPaC, 2011b)
- Survey guidelines for Australia's threatened fish (DSEWPaC, 2011a)
- Draft survey guidelines for Australia's threatened orchids (DoE, 2013a)
- Surveying threatened plants and their habitats – NSW survey guide for the Biodiversity Assessment Method (DPIE, 2020b)
- NSW Survey Guide for Threatened Frogs (DPIE, 2020a)
- 'Species credit' threatened bats and their habitats – NSW guide for the BAM (DPIE, 2021b)
- Koala (Phascolarctos cinereus) BAM Survey Guide (DPE, 2022)
- Policy and Guidelines for Fish Habitat Conservation and Management (DPI Fisheries, 2013)
- BioNet Threatened Species Profile Database (NSW DCCEEW).

These guidelines informed the selection of survey methods, timing and effort appropriate to the biodiversity values potentially affected by the amended project.

3.4.2 Flora survey methods

Flora surveys were undertaken to identify native vegetation communities, assess vegetation condition and determine the presence or potential presence of threatened flora species and threatened ecological communities listed under the EPBC Act.

Survey methods included:

- vegetation integrity and floristic assessments consistent with the BAM
- mapping and classification of plant community types
- targeted threatened flora surveys in areas of suitable habitat, informed by desktop analysis and guideline recommendations.

Survey effort was distributed along the amended project corridor to reflect variability in land use, vegetation type and condition. The results of flora surveys informed the identification and mapping of native vegetation, including EPBC-listed threatened ecological communities, and underpin the impact assessment presented in the Revised BDAR.

Further detail on flora survey methods, timing and results is provided in the section 2.5 of the Revised BDAR, including the tables summarising targeted species and threatened flora survey effort.

3.4.3 Terrestrial fauna survey methods

Terrestrial fauna surveys were undertaken to assess habitat availability and identify EPBC-listed threatened fauna species that are known or considered likely to occur within the amended project area.

Survey methods included:

- fauna habitat assessments to identify key habitat features such as hollow-bearing trees, woodland remnants, grasslands and landscape connectivity features
- targeted threatened fauna surveys informed by habitat suitability and relevant Commonwealth and NSW survey guidelines
- use of desktop data sources, including BioNet, to inform likelihood of occurrence and guide field survey effort.

Survey effort focused on habitats relevant to EPBC-listed species potentially affected by the amended project. Where targeted surveys were undertaken, methods and timing were selected in accordance with guideline recommendations appropriate to the species or species group.

Further detail on terrestrial fauna survey methods, effort and results is provided in the sections 2.6 & 2.7 of the Revised BDAR, including the tables summarising, targeted fauna groups and fauna survey effort.

3.4.4 Aquatic habitat assessment methods

Aquatic habitat assessments were undertaken to characterise watercourses and aquatic environments within or adjacent to the amended project area and to inform the assessment of potential impacts on aquatic biodiversity values, including EPBC-listed threatened fish species and fish habitat.

Aquatic survey methods included:

- desktop assessment of mapped waterways, drainage features and known aquatic biodiversity values
- field-based aquatic habitat assessments to characterise channel form, flow regime, substrate, riparian condition and habitat features
- assessment of fish habitat values consistent with the *Policy and Guidelines for Fish Habitat Conservation and Management.*

Targeted aquatic fauna surveys were undertaken where relevant to confirm habitat suitability and likelihood of occurrence of threatened aquatic species. Further detail on aquatic habitat and fauna assessment methods and results is provided in the Revised BDAR (sections 2.8 & 5.7 and associated tables) with detailed aquatic habitat assessment and species-specific outcomes presented in Appendix M – Aquatic biodiversity impact assessment.

3.4.5 Survey limitations

Survey limitations primarily relate to seasonal constraints, access limitations and species detectability, which are inherent to large, linear infrastructure projects. In some locations, access restrictions limited the timing or extent of field surveys, and the detectability of certain flora and fauna species may have been influenced by seasonal conditions or life-history characteristics.

Aquatic habitat assessments were undertaken at the time of survey and reflect conditions present during those periods; aquatic habitat quality and species presence may vary over time in response to seasonal flow conditions.

These limitations are documented in detail in the Revised BDAR (section 2.8) and have been considered in the EPBC Act assessment, including through the adoption of conservative or precautionary assumptions where appropriate.

4 Threatened biodiversity

4.1 Threatened ecological communities

A desktop assessment utilising the EPBC Protected Matters Search Tool (NSW DCCEEW, 2024c) determined nine EPBC listed Threatened Ecological Communities (TEC/s) with the potential to occur in the Indicative disturbance footprint (section 6.2.1 of the Revised BDAR). Following desktop assessment and detailed field verification surveys, seven TECs were considered to possibly occur within the Indicative disturbance footprint, being:

- The Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions – Endangered
- Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia – Endangered
- Natural Grasslands of the Murray Valley Plains – Critically Endangered
- Plains mallee box woodlands of the Murray Darling Depression, Riverina and Naracoorte Coastal Plain Bioregions – Critically Endangered
- Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains – Critically Endangered
- Weeping Myall Woodlands – Endangered
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland – Critically Endangered.

The remaining two threatened ecological communities that are considered unlikely to occur in the Indicative Disturbance Footprint but were listed in the PMST search results are:

- Mallee Bird Community of the Murray Darling Depression Bioregion – Endangered
- Natural Temperate Grassland of the South Eastern Highlands – Critically Endangered.

Both of these TECs are considered to have a low likelihood of occurrence due to geographic limitations of the listed community and have been excluded from further assessment (refer to section 6.2.1 of the Revised BDAR). A full assessment of likelihood of occurrence for all TECs identified by the PMST is provided in Attachment A.

Of the seven TECs with potential to occur in the Indicative disturbance footprint, six were recorded (Table 4.1).

Vegetation within the Indicative disturbance footprint did not meet the EPBC Act condition thresholds for the Critically Endangered Plains mallee box woodlands TEC. Although the associated Plant type Community (PCT) 170 was recorded, the canopy layer was absent or lacked the characteristic features required to satisfy the TEC criteria. A full assessment of recorded vegetation against the listing criteria for this TEC is provided in section 4.1.4 below, and this TEC is excluded from further assessment in the MNES assessment.

An assessment of the relevant listing criteria, key diagnostic characteristics and condition thresholds for each TEC is provided below in sections 4.1.1–4.1.7.

Table 4.1 Threatened Ecological Communities (TECs) within the Indicative disturbance footprint

TEC name	EPBC Act status	Associated vegetation zones within the Indicative disturbance footprint	Area within Indicative disturbance footprint (ha)
Buloke woodlands of the Riverina and Murray Darling Depression bioregions	Endangered	PCT 20_Thinned	0.03
		PCT 20_Thinned	0.21
		PCT 20_Derived	1.79
		Total	**2.03**
Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Endangered	PCT 237_Moderate-good	0.59
Natural Grasslands of the Murray Valley Plains	Critically Endangered	PCT 44_SVTM	0.01
		PCT 44_Moderate-good	15.16
		PCT 44_SVTM	0.19
		PCT 45_Moderate-good	3.50
		PCT 46_Moderate-good	48.13
		PCT 46_SVTM	14.06
		Total	**81.05**
Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains	Critically Endangered	PCT 47_Moderate-good	0.19
Weeping Myall Woodlands	Endangered	PCT 26_Moderate-good	77.77
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	PCT 266_Moderate-good	0.09
		PCT 277_Moderate-good	0.34
		PCT 277_Thinned	2.26
		Total	**2.69**

4.1.1 *Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions – Endangered*

Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions (hereafter referred to as Buloke Woodlands) is listed Endangered under the EPBC Act.

Buloke Woodlands is an ecological community where Buloke (*Allocasuarina luehmannii*) is usually the dominant or co-dominant tree. This community occurs from north-western and northern central Victoria into south central New South Wales within the in the Riverina and Murray-Darling Depression bioregions.

Within the Indicative disturbance footprint, one vegetation type, PCT 20 – Buloke – Moonah – Black Box open woodland on sandy rises of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion), was considered likely to associate with Buloke Woodlands TEC.

A summary of Buloke Woodlands threatened ecological community, associated PCT and extent within the indicative disturbance footprint for each IBRA subregion is summarized in Table 4.2. The location of Buloke Woodlands threatened ecological community in relation to the Indicative disturbance footprint is provided in section 15.9 of the Revised BDAR.

Table 4.2 Assessment of EPBC Act – listed Buloke Woodlands and associated PCT

Key diagnostic characteristics	**PCT 20_Thinned**	**PCT 20_Derived**
	VNI_DR104	**VNI_DR67**
Occur within the Riverina and/or Murray-Darling Depression IBRA bioregions?	Meets criteria. Vegetation associated with PCT 20 occurs within the Riverina IBRA bioregion.	Meets criteria. Vegetation associated with PCT 20 occurs within the Riverina IBRA bioregion.
Structure is typically open woodland to woodland but can be a forest (including high stem density), particularly temporarily following disturbance.	Meets criteria. Vegetation associated with PCT 20_Thinned occurs as an open woodland with evidence of historic clearing reducing patches of vegetation to low shrubland or grassland.	Does not meet criteria Structure is a grassland with no stags or stem count.
Typically has a canopy of trees dominated by *Allocasuarina luehmannii* (Buloke or Bull Oak), and sometimes other tree species are prominent such as *Callitris gracilis* (Slender Cypress Pine), *Callitris glaucophylla* (White/Murray pine), *Eucalyptus largiflorens* (Black Box), *E. leucoxylon* subsp. *pruinosa* (Yellow/Blue Gum) and *E. microcarpa* (Grey Box).	Meets criteria. Individuals of *Allocasuarina luehmannii, Callitris gracilis* or *Callitris glaucophylla* were not recorded at the VI plot site due to historical disturbance and clearing of wooded vegetation. However, it is recorded to occur nearby in the broader vegetation patch including areas extending outside of the amended project study area.	Meets criteria. Due to historic clearing of vegetation, *Allocasuarina luehmannii* cover has been reduced and sections of this PCT occur in a derived grassland condition. However, it is recorded to occur nearby in the broader vegetation patch including areas extending outside of the amended project study area.

Key diagnostic characteristics	PCT 20_Thinned	PCT 20_Derived
	VNI_DR104	VNI_DR67
Following disturbance, *A. luehmannii* and other trees can be sparse or disappear, and the ecological community may develop as a low shrubland or grassland. In these instances, evidence for the occurrence of the ecological community may include the presence of dead *A. luehmannii* trees or stumps or previous records of *A. luehmannii* trees in the landscape; or that, or other characteristic species were present.		
Contain any of the following native species: Native grasses – *Rytidosperma* spp. (wallaby grasses) (such as *R. caespitosum* and *R. setaceum*), *Austrostipa* spp. (spear grasses) (such as *A. blackii* and *A. elegantissima*) and other grasses including *Anthosachne scabra* (syn. *Elymus scaber*) and *Chloris truncata*. Native subshrubs and herbs – *Brachyscome lineariloba* (hard-headed daisy), *Calandrinia eremaea* (small purslane), *Calocephalus citreus* (lemon beauty-heads), *Calotis hispidula* (bogan flea, bindy eye), *Convolvulus remotus* (grassy bindweed), *Crassula colorata* (dense crassula), *Crassula sieberiana* (Australian stonecrop), *Daucus glochidiatus* (wild carrot), *Einadia nutans* (nodding saltbush), *Enchylaena tomentosa* (ruby saltbush), *Eutaxia microphylla* (common eutaxia), *Senecio pinnatifolius* (variable groundsel), *Sida corrugata* (variable sida), *Maireana enchylaenoides* (wingless bluebush), *Oxalis perennans, Ptilotus nobilis* subsp. *semilanatus* (syn. *Ptilotus exaltatus* var. *semilanatus*), *Sida corrugata* (corrugated sida), *Sclerolaena diacantha* (grey copperburr), *Swainsona procumbens* (Darling pea), *Vittadinia* spp. (New Holland daisies) and *Wahlenbergia luteola*.	Meets criteria. For grasses – *Austrostipa scabra* subsp. *scabra* and *Chloris truncata* For subshrubs – *Enchylaena tomentosa, Sclerolaena diacantha, Crassula sieberiana, Einadia nutans* subsp. *nutans,* and *Oxalis perennans*.	Meets criteria. For subshrubs and herbs – *Enchylaena tomentosa* and *Crassula sieberiana.*

Key diagnostic characteristics	PCT 20_Thinned	PCT 20_Derived
	VNI_DR104	VNI_DR67
There is no condition threshold described for this community in the determination. Vegetation with abundant weeds, but with the characteristic trees also present, should be considered as part of the ecological community amenable to rehabilitation.	Meets criteria. Any vegetation in which characteristic native species dominate any structural layer present is considered to constitute the community.	Meets criteria. Trees are not present, however any vegetation in which characteristic native species dominate any structural layer present is considered to constitute the community. The vegetation integrity is less than 15 and offsetting will not be required as this vegetation is unlikely to function as an ecological community.
Outcome	**Meets key characteristics – forms part of the ecological community**	**Meets key characteristics – forms part of the ecological community**

Table 4.3 Summary of Buloke Woodland within the Indicative disturbance footprint

Threatened ecological community	Vegetation type	IBRA subregion	Veg zone name (BAM-C)	Impact (ha)
Buloke woodlands of the Riverina and Murray Darling Depression bioregions	PCT 20 – Buloke – Moonah – Black Box open woodland on sandy rises of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Murray Fans	VZ Thinned	0.03
		Murrumbidgee	VZ #6 Thinned	0.21
			VZ #12 Derived	1.79
Total				**2.03**

4.1.2 Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia – Endangered

Grey Box (*Eucalyptus microcarpa*) grassy woodlands and derived native grasslands of south-eastern Australia (hereafter Grey Box woodlands) is described in the EPBC Listing Advice as a woodland to open forest with a mid-high to tall, up to 25 metres, canopy of predominately eucalypts. The tree canopy of this TEC is usually dominated by Grey Box (*Eucalyptus microcarpa*). Widespread tree associations include *Allocasuarina luehmannii* (Buloke), *Brachychiton populneus* (Kurrajong), *Callitris glaucophylla* (White Cypress Pine), *Eucalyptus albens* (White Box), *E. camaldulensis* (River Red Gum), *E. conica* (Fuzzy Box) *E. leucoxylon* (Yellow Gum), *E. melliodora* (Yellow Box) and *E. populnea* (Bimble Box). A moderately dense to sparse shrub-layer and species-rich ground layer of grasses and herbs comprise the understorey. Widespread shrubs include species of *Acacia*, *Bursaria*, *Cassinia*, *Dodonaea*, *Eremophila* and *Maireana.* Common grasses include Wallaby Grasses (*Rytidosperma*), Spear Grasses (*Austrostipa*), Wheatgrass (*Elymus*), Windmill Grasses (*Enteropogon*), Flax-lilies (*Dianella*) and Mat-rushes (*Lomandra*). More common compared to other temperate grassy woodlands are chenopod species, including *Einadia hastata* (Saloop), *E. nutans subsp. nutans* (Nodding Saltbush), E*nchylaena tomentosa* (Ruby Saltbush), *Maireana enchylaenoides* (Wingless Bluebush) and *Sclerolaena diacantha* (Grey Copperburr). Patches of derived grassland are included within this ecological community, where the native ground layer is still largely intact and a tree canopy of Grey Box was known to have been removed. Evidence of former canopy or mid layer may include tree stumps or fallen logs, nearby native remnant vegetation types, historic records and images, and pre-European vegetation modelling.

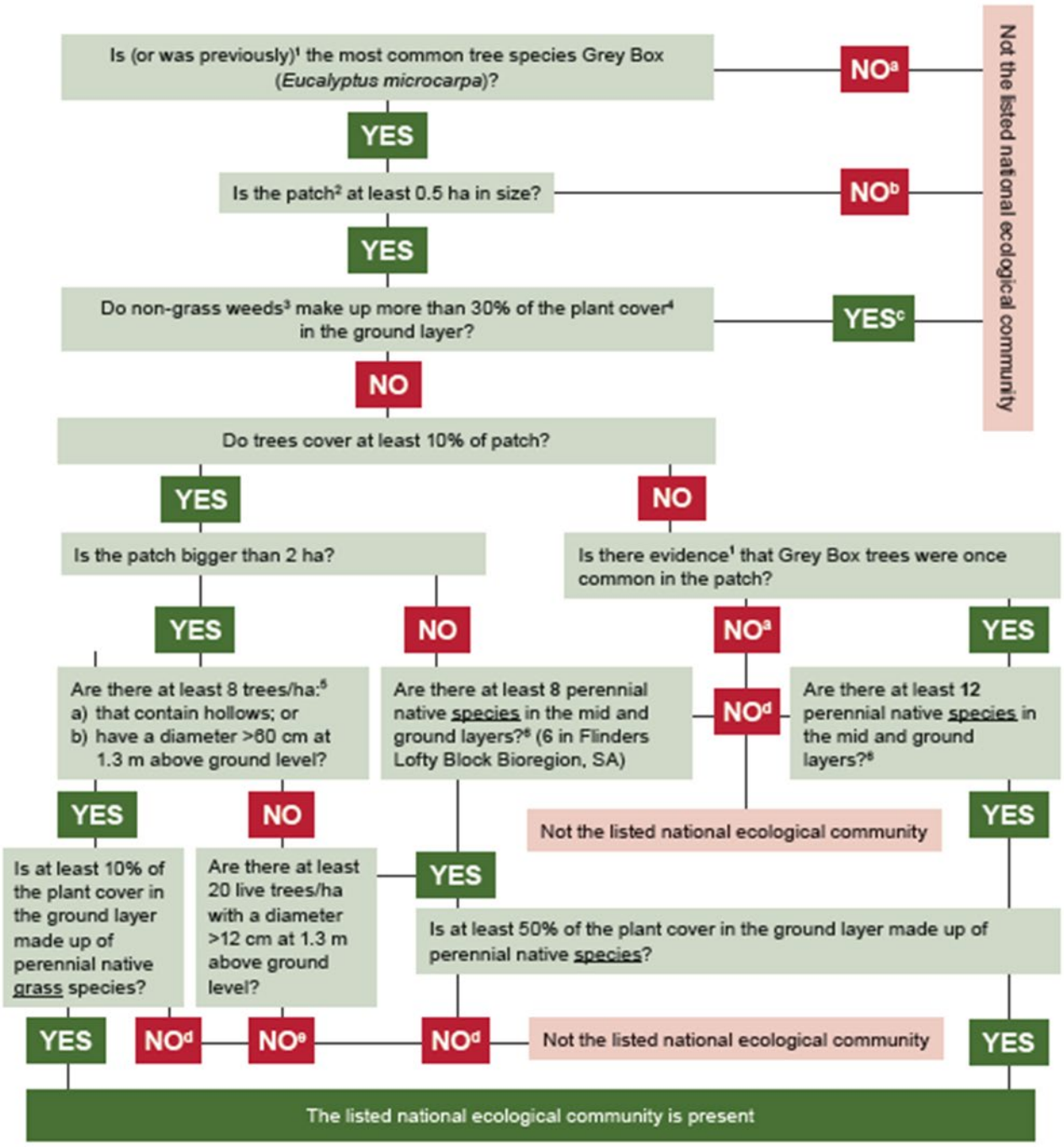
The community predominantly occurs on the drier edge of the temperate grassy eucalypt woodland belt, which was formerly a widespread area on the lower slopes and plains of mainland eastern Australia, and ranges from central NSW through northern and central Victoria into South Australia. Typically occurring in low-relief landscapes on alluvial or colluvial productive soils, occupying drier sites of the belt, with a mean average rainfall of 375 to 700 millimetres annually. South of the Great Dividing Range in Victoria, around Melton and Sunbury to the west of Melbourne, are disjunct patches, as well as areas to the west of the Murray River coastal plain in South Australia, around the Flinders and Mount Lofty Ranges near Adelaide.

This ecological community occupies a complex position within the landscape. Within NSW it can be transitional between the temperate lower slopes and tablelands occupied by, e.g. the EPBC Act-listed White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland ecological community, and the semi-arid floodplain communities.

Within the Indicative disturbance footprint one vegetation type was identified as being likely associated with this threatened ecological community being PCT 237 – Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone.

For a vegetation patch to meet the threatened ecological listing of Grey Box (*Eucalyptus microcarpa*) grassy woodlands and derived native grasslands of south-eastern Australia it must meet specific EPBC listing advice key characteristics and condition threshold criteria as outlined in Figure 4.1. An assessment of this key diagnostic characteristics and condition threshold criteria against recorded plot data is presented in Table 4.4.

A summary of Grey Box woodlands threatened ecological community, associated PCT and extent within the indicative disturbance footprint for each IBRA subregion is presented in Table 4.5.



1 Evidence that Grey Box was originally present might include stumps, historical records or presence in nearby vegetation.
2 When considering a patch it is important to note that a patch may extend beyond a property or development site boundary. For the purposes of determining whether or not a patch meets the minimum patch size of the condition thresholds for the ecological community, the entire patch should be considered, not just the area occurring on a property or development site.
3 A weed is defined here as a plant species that is not native to Australia and the species has established viable self-sustaining populations in a region.
4 Plant cover excludes mosses and lichens. Patches of bare ground or leaf litter are also not included.
5 Dead trees are included if present, up to 50% of the total tree count.
6 Relevant growth-forms to include are: grasses, other graminoids, forbs and shrubs less than 4 metres tall. Shrubs that are 4 metres or more in height and non-vascular plants (mosses and lichens) are not included.

Figure 4.1 Listing advice key characteristics and condition thresholds for Grey Box (*Eucalyptus microcarpa)* grassy woodlands and derived native grasslands of south-eastern Australia

Table 4.4 Assessment against Grey Box (*Eucalyptus microcarpa*) grassy woodlands and derived native grasslands of south-eastern Australia EPBC Act listing advice criteria

Key diagnostic characteristics and condition threshold	**PCT 237 – Moderate-good**	
	VNI_DR47	**NM034**
The ecological community occurs on low slopes and plains from central NSW, through northern and central Victoria into South Australia.	Yes This PCT was recorded to occur in the NSW Riverina IBRA Bioregion (Murray Fans subregion).	Yes This PCT was recorded to occur in the NSW Riverina IBRA Bioregion (Murray Fans subregion).
The tree canopy is dominated (greater than 50 per cent canopy crown cover) by *Eucalyptus microcarpa* (Grey Box). Other tree species may be present in the canopy and, in certain circumstances may be co-dominate with Grey Box but are never dominant on their own. These associated species are listed in Appendix A of the listing advice.	Yes *Eucalyptus microcarpa* accounted for 70 per cent canopy cover.	Yes *Eucalyptus microcarpa* accounted for 95 per cent canopy cover.
Broad criteria 1a. The minimum patch size is 0.5 ha. AND 1b. The canopy layer contains Grey Box (*Eucalyptus microcarpa)* as the dominant or co-dominant tree species. AND 1c. The vegetative cover of non-grass weed species in the ground layer is less than 30 per cent at any time of the year AND Meets criteria in either section 2., 3., 4. or 5. (see below)	1a. Meets criteria with patch size >0.5 ha (patch size roughly 3.8 ha). 1b. Meets criteria. *Eucalyptus microcarpa* is the dominant tree species recorded. 1c. Meets criteria with <30 per cent vegetative cover of non-grass weed species in the ground layer (cover recorded at 3.3 per cent of total ground cover).	1a. Meets criteria with patch size >0.5 ha (patch size roughly 1.0 ha). 1b. Meets criteria. *Eucalyptus microcarpa* is the dominant tree species recorded. 1c. Meets criteria with <30 per cent vegetative cover of non-grass weed species in the ground layer (cover recorded at 0 per cent of total ground cover).

Key diagnostic characteristics and condition threshold	PCT 237 – Moderate-good	
	VNI_DR47	NM034
Smaller woodland patches – 0.5 to <2 ha in area with tree crown cover >10 per cent 2a. At least 50 per cent of the vegetative cover in the ground layer comprises perennial native species at any time of the year AND 2b. 8 or more perennial native species are present in the mid and ground layers at any time of the year.	Patch size is >2 ha.	2a. Meets criteria. >50 per cent vegetative cover in the ground layer comprises perennial native species. (Cover recorded at 87 per cent). 2b. Meets criteria. >8 perennial native species are present in the mid and ground layer. (Recorded 12 perennial native species present).
Larger woodland patches – 2 ha or more in area 3a. At least 8 trees/ha are hollow bearing or have a diameter at breast height of 60 cm or more AND 3b. at least 10 per cent of the vegetative ground cover comprises perennial native grasses at any time of the year. OR 4a. At least 20 trees/ha have a diameter at breast height of 12 cm or more. AND 4b. at least 50 per cent of vegetative cover in the ground layer comprises perennial native species.	3a. Meets criteria. Plot contains 3 hollow bearing trees which averages 30 hollow bearing trees per hectare. Plot contains 3 trees with a breast height >60 cm. 3b. Does not meet criteria. Plot recorded in May. Perennial native grass cover comprises 4.9 per cent of total vegetative ground cover. 4a. Meets criteria. Plot contains 4 trees with diameter >12 cm at breast height. This averages to 40 trees/ha. 4b. Meets criteria. 89.3 per cent of vegetative cover in the ground layer comprises of perennial native species.	Patch size is <2 ha.

Key diagnostic characteristics and condition threshold	PCT 237 – Moderate-good	
	VNI_DR47	**NM034**
Derived native grasslands – the canopy is less developed or absent (at least 0.5 ha in area) 5a. Woodland density does not meet criteria 3a or 4a or is derived grassland with clear evidence that the site formerly was a woodland with a tree canopy dominated or co-dominated by *E. microcarpa.* AND 5b. At least 50 per cent of the vegetative cover in the ground layer is made up of perennial native species at any time of the year. AND 5c. 12 or more native species are present in the ground layer at any time of the year	Is not a derived native grassland.	Is not a derived native grassland.
Outcome	**Meets key characteristics and condition threshold – forms part of the ecological community**	**Meets key characteristics and condition threshold – forms part of the ecological community**

Table 4.5 Summary of Grey Box TEC within the Indicative disturbance footprint

Threatened ecological community	Vegetation type	IBRA subregion	Veg zone name (BAM-C)	Impact (ha)
Inland Grey Box Woodlands in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	PCT 237 – Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone	Murray Fans	VZ #11 Moderate-good	0.59
Total				**0.59**

4.1.3 Natural Grasslands of the Murray Valley Plains – Critically Endangered

The Natural Grasslands of the Murray Valley Plains TEC (hereafter Natural Grasslands) is listed as Critically Endangered under the EPBC Act. The Listing Advice describes the community as an open to closed tussock grassland With trees and large shrubs generally absent. Less than 10 per cent projective foliage cover may be present from this stratum, with common species including *Eucalyptus spp*., Umbrella Wattle (*Acacia oswaldii*), Nitre-bush (*Nitraria billardierei*) and Weeping Myall (*A. pendula*) (in NSW). The ground layer is dominated by *Rytidosperma spp*., Spear Grasses (*Austrostipa spp.*) and/or Curly Windmill Grass (*Enteropogon sp.*). Herbland / forbland may be a better description for areas where grasses are sparse, with common species including Vanilla Lilies (*Arthropodium spp*.), Bulbine Lilies (*Bulbine spp*.), Pale Beauty Heads (*Calocephalus sonderi*), Common Everlasting (*Chrysocephalum apiculatum*), Scaly Buttons (*Leptorhynchos squamatus*), Minnie Daisy (*Minuria leptophylla*), Grassland Wood-sorrel (*Oxalis perennans*), Paper Sunray (*Rhodanthe corymbiflora*) and Variable Sida (*Sida corrugata*). Some sites may see a gradation into open grassy shrubland with co-dominant low chenopod shrubs and grasses. Chenopods commonly include Creeping Saltbush (*Atriplex semibaccata*), Common Bluebush (M*airena decalvans*), Wingless Bluebush (*M. enchylaenoides*), Bottle Bluebush (*M. excavata*), Dwarf Bluebush (*M. humillima*) and Slender Bluebush (*M. pentagona*).

Occurring predominately across the southern Riverina bioregion, this ecological community extends into parts of the Murray Darling Depression and NSW South-Western Slopes bioregions on a landscape of flat alluvial plains. The climatic zone for Natural Grasslands of the Murray Valley Plains being the transition from temperate to semi-arid, and a strong influence on species composition alongside soils. Quaternary alluvial sediments of calcareous clay loams and clays, including self-mulching/cracking clays, are associated with this community (Department of Sustainability, Environment, Water, Population and Communities 2012).

Within the Indicative disturbance footprint, three vegetation types were considered likely to associate with this threatened ecological community. These are:

- PCT 44 – Forb-rich Speargrass – Windmill Grass – White Top grassland of the Riverina Bioregion
- PCT 45 – Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion
- PCT 46 – Curly Windmill Grass – speargrass – wallaby grass grassland on alluvial clay and loam on the Hay plain, Riverina Bioregion.

For a vegetation patch to meet the threatened ecological listing of Natural Grasslands of the Murray Valley Plains, it must meet specific EPBC listing advice for both the key characteristics and condition threshold criteria as outlined in Figure 4.2. An assessment of the two-step key diagnostic characteristics and condition threshold criteria for this ecological community against recorded PCTs and associated plot data is presented in Table 4.6 to Table 4.9.

Where candidate PCTs have been identified by State Vegetation Type Mapping, vegetation has been assumed to meet benchmark conditions outlined in BioNet Vegetation Classification system for the purposes of this assessment and are considered to meet minimum requirements for the Natural Grasslands TEC. Where candidate PCTs have been identified as part of the EnergyConnect (NSW – Eastern section) project, data has been extracted from the Revised BDAR and utilised in this assessment (WSP, 2022).

The first of the key diagnostic criteria states the approximate northern limit of the ecological community to be within the Murrumbidgee subregion approximately near the northern boundary of the Murray Catchment Management Authority (CMA) in NSW. The Indicative disturbance footprint sits within Murrumbidgee IBRA subregion and within 10 kilometres north of this CMA boundary therefore all plots within the Indicative disturbance footprint are considered to occur within the distribution of the Native Grasslands of the Murray Valley Plains TEC.

A summary of Natural Grasslands threatened ecological community, associated PCT and extent within the Indicative disturbance footprint for each IBRA subregion is summarised in Table 4.10.

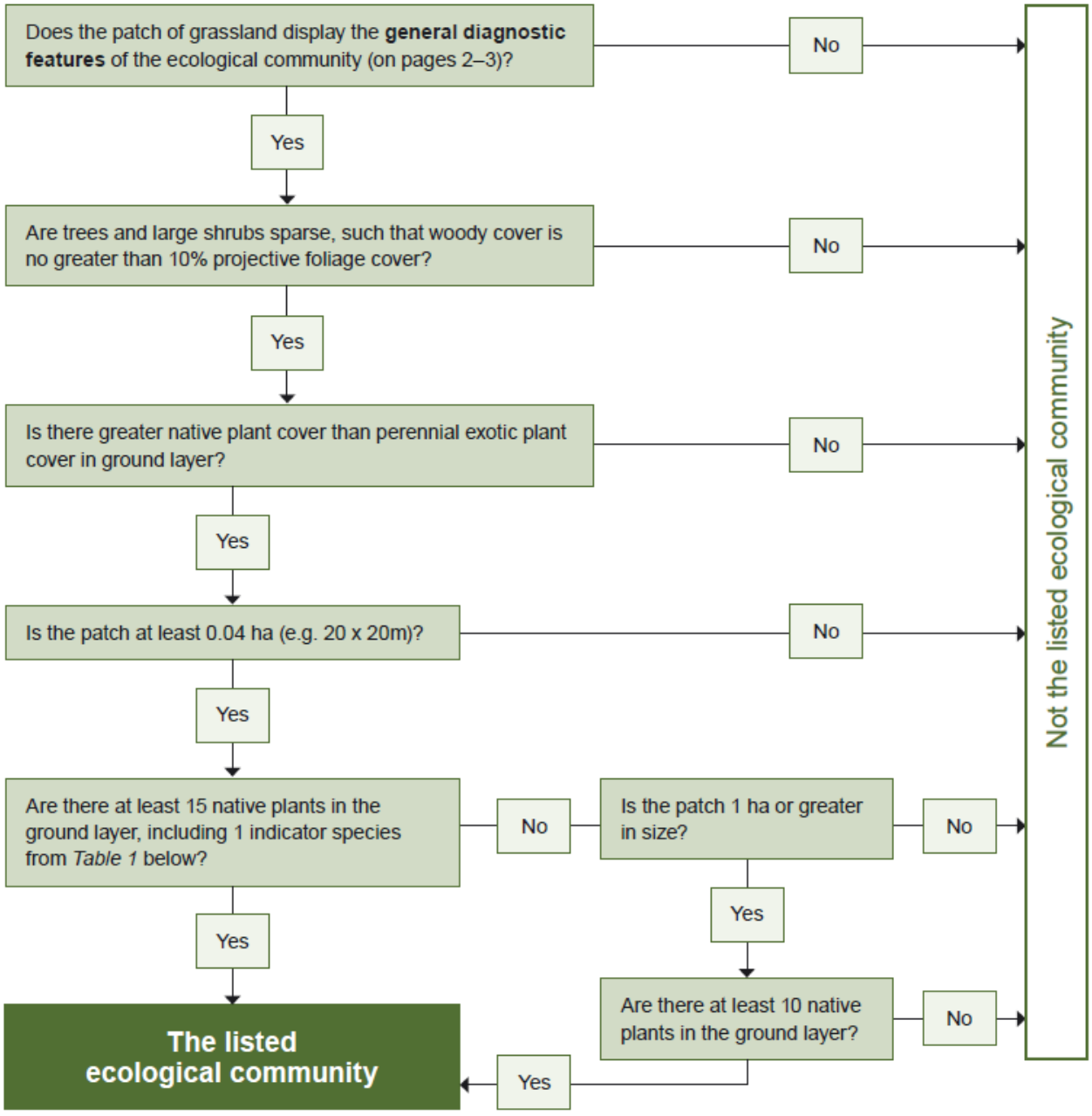


Figure 4.2 Listing advice key characteristic and condition thresholds for Natural Grasslands TEC

Table 4.6 Assessment Step 1: use key diagnostic characteristics to identify if the ecological community is present for representative patches assigned to PCT 44 – Forb-rich speargrass – Windmill Grass – White Top grassland of the Riverina Bioregion

Key diagnostic characteristics	**PCT 44 – Moderate-good**						
	VNI_DR14	**VNI_DR32**	**VNI_DR34**	**VNI_DR63**	**VNI_DR89**	**VNI_DR99**	**VNI_DR100**
Distribution is primarily in the Riverina Bioregion and the Wimmera plains of the Murray Darling Depression Bioregion. Other outlying occurrences are also in the Murray Darling Depression Bioregion and the NSW South Western Slopes Bioregion. The approximate northern limit of the ecological community is in the Murrumbidgee subregion (IBRA RIV2), approximately near the northern boundary of the Murray Catchment Management Authority (CMA) in NSW.	Occurs in the Murrumbidgee subregion (IBRA RIV2) of the Riverina Bioregion. Patch is approximately 6 km north of the northern boundary of the Murray CMA.	Occurs in the Murrumbidgee subregion (IBRA RIV2) of the Riverina Bioregion. Patch is approximately 6 km north of the northern boundary of the Murray CMA.	Occurs in the Murrumbidgee subregion (IBRA RIV2) of the Riverina Bioregion. Patch is approximately 7 km north of the northern boundary of the Murray CMA.	Occurs in the Murrumbidgee subregion (IBRA RIV2) of the Riverina Bioregion. Patch is approximately 7 km north of the northern boundary of the Murray CMA.	Occurs in the Murrumbidgee subregion (IBRA RIV2) of the Riverina Bioregion. Patch is approximately 6 km north of the northern boundary of the Murray CMA.	Occurs in the Murrumbidgee subregion (IBRA RIV2) of the Riverina Bioregion. Patch is approximately 2 km north of the northern boundary of the Murray CMA.	Occurs in the Murrumbidgee subregion (IBRA RIV2) of the Riverina Bioregion. Patch is approximately 5 km north of the northern boundary of the Murray CMA.
It typically occurs on a landscape of flat alluvial lowland plains with heavy-textured grey, brown and red clays.	Occurs on and alluvial plain with red to red-brown clay loam soil.	Occurs on an alluvial plain with grey-brown clay soil.	Occurs on and alluvial plain with red clay loam soil.	Occurs on and alluvial plain with red-brown sandy clay soil.	Occurs on and alluvial plain with red-brown clay soil.	Occurs on and alluvial plain with light brown clay soil.	Occurs on an alluvial plain with red clay soil.
The ecological community is typically dominated by a range of perennial grasses and/or forbs or co-dominated by small shrubs. Sites are not necessarily dominated by any particular plant species. Characteristic genera present typically include: — for grasses – *Rytidosperma, Austrostipa, Chloris* and *Enteropogon*, — for forbs – *Arthropodium, Bulbine, Calotis, Chrysocephalum, Leptorhynchos, Minuria, Ptilotus, Rhodanthe, Sida* and *Swainsona*, — for small shrubs – *Atriplex* and *Maireana*.	For grasses – *Rytidosperma*, *Austrostipa*, *Chloris* and *Enteropogon* were recorded. For forbs – *Chrysocephalum* and *Sida* were recorded. For shrubs – *Maireana* was recorded.	For grasses –*Enteropogon, Rytidosperma* and *Chloris* were recorded. For forbs – None recorded. For shrubs –*Maireana* and *Atriplex* were recorded.	For grasses – *Rytidosperma, Chloris and Austrostipa* were recorded. For forbs – *Chrysocephalum* and *Sida* were recorded. For shrubs –*Maireana* and *Atriplex* were recorded.	For grasses – *Rytidosperma, Enteropogon and Austrostipa* were recorded. For forbs – *Calotis*, *Ptilotus, Rhodanthe,* and *Swainsona* were recorded. For shrubs –*Maireana* was recorded.	For grasses – *Rytidosperma, Enteropogon and Austrostipa* were recorded. For forbs – *Bulbine*, *Chrysocephalum, Rhodanthe, Sida* and *Swainsona* were recorded. For shrubs –*Maireana* was recorded.	For grasses – *Rytidosperma* was recorded. For forbs – *Rhodanthe* was recorded. For shrubs –*Maireana* was recorded.	For grasses – *Rytidosperma* and *Austrostipa* were recorded. For forbs – *Chrysocephalum*, *Rhodanthe* and *Sida* were recorded. For shrubs –*Maireana* and *Atriplex* were recorded.
Trees and large shrubs (>1 m tall) are generally absent to sparse, amounting to less than 10 per cent projective foliage cover. Where woodlands overlap or adjoin with the ecological community an outer boundary of two times the canopy width of the dominant tree species is applied.	Trees and large shrubs were absent.	Trees and large shrubs were absent.	Trees and large shrubs were absent	Trees and large shrubs were absent	Trees and large shrubs were absent	Trees and large shrubs were absent	Trees and large shrubs were absent
The patch should contain at least as many, preferably more, of the species in Table 1(A) than in Table 1(B) of the listing advice, when assessed at an appropriate time (e.g. late winter-spring and not soon after disturbance such as grazing). The species in Table 1(A) are characteristic of the natural grassland ecological community and not derived grasslands, and the opposite applies to Table 1(B). Note this generally only applies to grasslands occurring in the Lachlan (RIV 1) and Murrumbidgee (RIV 2) IBRA subregions.	The plot was not recorded during an appropriate time of year for assessment (recorded in Feb). Associated patch of vegetation retained for assessment.	The plot was not recorded during an appropriate time of year for assessment (recorded in May). Associated patch of vegetation retained for assessment.	The plot was not recorded during an appropriate time of year for assessment (recorded in May). Associated patch of vegetation retained for assessment.	Plot recorded in August. Of the 22 native species recorded 4 occur in Table 1 (A) and 2 occur in Table 1 (B).	Plot recorded in October. Of the 24 native species recorded 5 occur in Table 1 (A) and 5 occur in Table 1 (B).	Plot recorded in October. Of the 14 native species recorded 0 occur in Table 1 (A) and 4 occur in Table 1 (B).	Plot recorded in October. Of the 23 native species recorded 3 occur in Table 1 (A) and 4 occur in Table 1 (B). However, vegetation was subject to active grazing by domestic livestock reducing the abundance of annual herbs. Associated patch of vegetation retained for assessment.
If there is reliable evidence (e.g. historical records, photographs) that a patch was once woodland or shrubland with >10 per cent cover (of trees, shrubs >1 m), then the patch is not considered to be part of the ecological community.	There is no evidence that the patch was once a woodland or shrubland.	There is no evidence that the patch was once a woodland or shrubland.	There is no evidence that the patch was once a woodland or shrubland.	There is no evidence that the patch was once a woodland or shrubland.	There is no evidence that the patch was once a woodland or shrubland.	There is no evidence that the patch was once a woodland or shrubland.	There is no evidence that the patch was once a woodland or shrubland.
Soil type and landscape position (e.g. Alluvial soils, plains) that correspond with the ecological community and no other vegetation types may also assist in identifying the likely occurrence of natural grasslands ecological community.	The patch occurs on alluvial soils associated with a broad plain.	The patch occurs on alluvial soils associated with a broad plain.	The patch occurs on alluvial soils associated with a broad plain.	The patch occurs on alluvial soils associated with a broad plain.	The patch occurs on alluvial soils associated with a broad plain.	The patch occurs on alluvial soils associated with a broad plain.	The patch occurs on alluvial soils associated with a broad plain.
Outcome	**Meets Step 1 – key diagnostic characteristics**	**Meets Step 1 – key diagnostic characteristics**	**Meets Step 1 – key diagnostic characteristics**	**Meets Step 1 – key diagnostic characteristics**	**Meets Step 1 – key diagnostic characteristics**	**Meets Step 1 – key diagnostic characteristics**	**Meets Step 1 – key diagnostic characteristics**

Table 4.7 Assessment Step 2: Determine condition of the ecological community for representative patches assigned to PCT 44 Forb-rich Speargrass – Windmill Grass – White Top grasslands of the Riverina Bioregion that meet Step 1 key diagnostic characteristics

PCT & Condition	**44 Moderate-good**						
Condition thresholds	**VNI_DR14**	**VNI_DR32**	**VNI_DR34**	**VNI_DR63**	**VNI_DR89**	**VNI_DR99**	**VNI_DR100**
For all patches of the ecological community. The percentage cover of native vascular plants (annual and perennial) in the patch is greater than the percentage cover of perennial exotic species. AND Either category A or category B thresholds are met as below	Meets threshold. Native vascular cover was recorded at 99.9% with perennial exotic cover recorded at 0%.	Meets threshold. Native vascular cover was recorded at 99.7% with perennial exotic cover recorded at 0%.	Meets threshold. Native vascular cover was recorded at 99.9% with perennial exotic cover recorded at 0%.	Meets threshold. Native vascular cover was recorded at 96.3% with perennial exotic cover recorded at 0.4%.	Meets threshold. Native vascular cover was recorded at 94.8% with perennial exotic cover recorded at 0.15%.	Meets threshold. Native vascular cover was recorded at 100% with perennial exotic cover recorded at 0%.	Meets threshold. Native vascular cover was recorded at 98.1% with perennial exotic cover recorded at 0%.
Category A. For patches with high diversity or that are relatively undisturbed. This recognises that many patches of the ecological community can maintain their diversity despite the highly fragmented nature of the community or small patch sizes: A1. 15 or more vascular plant species are present in the patch. AND A2. The patch contains one or more indicator species in Table 2, characteristic of sites that are relatively undisturbed (e.g. have little to no history of cultivation). AND Patch size: A3. The size of the grassland patch is at least 0.04 ha or more in size (i.e. at least 400 m^2 or a 20 m x 20 m square or equivalent area in any shape.	A1. Meets condition threshold with 18 native vascular plant species recorded. A2. Meets condition threshold with 2 indicator species recorded being: *Maireana aphylla and Maireana excavata.* A3. Meets condition threshold with patch size exceeding 0.04 ha (patch size >30 ha).	A1. Does not meet condition threshold with only 10 native vascular plant species recorded. A2. Meets condition threshold with 1 indicator species recorded being: Leucochrysum molle.	A1. Meets condition threshold with 16 native vascular plant species recorded. A2. Meets condition threshold with 5 indicator species recorded being: *Eriochlamys behrii, Maireana pentagona, Leiocarpa panaetioides, Maireana aphylla and Maireana excavata.* A3. Meets condition threshold with patch size exceeding 0.04 ha (patch size >6 ha).	A1. Meets condition threshold with 22 native vascular plant species recorded. A2. Meets condition threshold with 11 indicator species recorded being: *Calotis scabiosifolia, Daucus glochidiatus*, *Goodenia pusilliflora, Hyalosperma glutinosum, Leiocarpa panaetioides, Leucochrysum molle, Maireana aphylla, Maireana excavata, Ptilotus spathulatus, Rhodanthe pygmaea* and *Wurmbea dioica.* A3. Meets condition threshold with patch size exceeding 0.04 ha (patch size >2 ha).	A1. Meets condition threshold with 25 native vascular plant species recorded. A2. Meets condition threshold with 4 indicator species recorded being: *Bulbine bulbosa, Daucus glochidiatus, Hyalosperma glutinosum, Maireana aphylla, Maireana humillima, Maireana pentagona, Swainsona murrayana, Wurmbea dioica.* A3. Meets condition threshold with patch size exceeding 0.04 ha (patch size >5 ha).	A1. Does not meet condition threshold with only 13 native vascular plants species recorded.	A1. Meets condition threshold with 23 native vascular plant species recorded. A2. Meets condition threshold with 2 indicator species recorded being: *Eriochlamys behrii, Hyalosperma glutinosum, Maireana aphylla and Maireana humillima, Maireana pentagona and Wurmbea dioica.* A3. Meets condition threshold with patch size exceeding 0.04 ha (patch size >1.5 ha).

PCT & Condition	44 Moderate-good						
Condition thresholds	**VNI_DR14**	**VNI_DR32**	**VNI_DR34**	**VNI_DR63**	**VNI_DR89**	**VNI_DR99**	**VNI_DR100**
Category B. For larger patches that have good ground layer diversity: This applies where patches of the ecological community do not meet the high diversity or lack or disturbance criteria in Category A but still retain sufficient elements of their natural diversity. Ground layer diversity: B1. 10 or more native vascular plant species are present in the patch. AND Patch size: B2. The size of the grassland patch is at least 1 ha or more in size (i.e. at least 10,000 m^2 or a 100 m x 100 m square or equivalent area in any shape).	Meets Category A.	B1. Meets condition threshold with only 10 native vascular plant species recorded. B2. Meets condition threshold with patch size exceeding 1.0 ha (patch size >14 ha).	Meets Category A.	Meets Category A.	Meets Category A.	B1. Meets condition threshold with 13 native vascular plant species recorded. B2. Meets condition threshold with patch size exceeding 1.0 ha.	Meets Category A.
Outcome	**Meets Step 2 (Category A) – condition threshold and forms part of the ecological community.**	**Meets Step 2 (Category B) – condition threshold and forms part of the ecological community.**	**Meets Step 2 (Category A) – condition threshold and forms part of the ecological community.**	**Meets Step 2 (Category A) – condition threshold and forms part of the ecological community.**	**Meets Step 2 (Category A) – condition threshold and forms part of the ecological community.**	**Meets Step 2 (Category B) – condition threshold and forms part of the ecological community.**	**Meets Step 2 (Category A) – condition threshold and forms part of the ecological community.**

Table 4.8 Assessment Step 1: use key diagnostic characteristics to identify if the ecological community is present for representative patches assigned to PCT 45 – Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion and PCT 46 – Curly Windmill Grass – speargrass – wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion

PCT & Condition	**PCT 45 – Moderate-good**		**PCT 46 – Moderate-good**				
Key diagnostic characteristics	**Q193E (PEC)**	**Q196E (PEC)**	**VNI_DR10**	**VNIOZ_11**	**VNI_NM018**	**VNI_DR64**	**VNI_DR88**
Distribution is primarily in the Riverina Bioregion and the Wimmera plains of the Murray Darling Depression Bioregion. Other outlying occurrences are also in the Murray Darling Depression Bioregion and the NSW South Western Slopes Bioregion. The approximate northern limit of the ecological community is in the Murrumbidgee subregion (IBRA RIV2), approximately near the northern boundary of the Murray Catchment Management Authority (CMA) in NSW.	Occurs in the Murrumbidgee subregion (IBRA RIV2) of the Riverina Bioregion. Patch is approximately 5 km north of the northern boundary of the Murray CMA.	Occurs in the Murrumbidgee subregion (IBRA RIV2) of the Riverina Bioregion. Patch is approximately 5 km north of the northern boundary of the Murray CMA.	Occurs in the Murrumbidgee subregion (IBRA RIV2) of the Riverina Bioregion. Patch is approximately 5 km north of the northern boundary of the Murray CMA.	Occurs in the Murrumbidgee subregion (IBRA RIV2) of the Riverina Bioregion. Patch is approximately 8.5 km north of the northern boundary of the Murray CMA.	Occurs in the Murrumbidgee subregion (IBRA RIV2) of the Riverina Bioregion. Patch is approximately 9 km north of the northern boundary of the Murray CMA.	Occurs in the Murrumbidgee subregion (IBRA RIV2) of the Riverina Bioregion. Patch is approximately 8.8 km north of the northern boundary of the Murray CMA.	Occurs in the Murrumbidgee subregion (IBRA RIV2) of the Riverina Bioregion. Patch is approximately 7.5 km north of the northern boundary of the Murray CMA.
It typically occurs on a landscape of flat alluvial lowland plains with heavy-textured grey, brown and red clays.	Occurs on grey clay loam.	Occurs on grey clay loam.	Occurs on grey clay.	Occurs on grey clay loam.	Occurs on grey clay.	Occurs on grey clay.	Occurs on brown clay.
The ecological community is typically dominated by a range of perennial grasses and/or forbs or co-dominated by small shrubs. Sites are not necessarily dominated by any particular plant species. Characteristic genera present typically include: — for grasses – *Rytidosperma, Austrostipa, Chloris* and *Enteropogon*, — for forbs – *Arthropodium, Bulbine, Calotis, Chrysocephalum, Leptorhynchos, Minuria, Ptilotus, Rhodanthe, Sida* and *Swainsona*, — for small shrubs – *Atriplex* and *Maireana*.	For grasses – *Enteropogon* and *Austrostipa* were recorded For forbs – *Calotis, Chrysocephalum* and *Rhodanthe* were recorded For shrubs –*Maireana* was recorded.	For grasses – *Austrostipa, Enteropogon* and *Rytidosperma* were recorded For forbs – *Rhodanthe* was recorded For shrubs –*Maireana* was recorded.	For grasses – *Austrostipa, Enteropogon* and *Rytidosperma* were recorded For forbs – *Calotis*, *Rhodanthe and Sida* were recorded For shrubs –*Maireana* and *Atriplex* were recorded.	For grasses – *Enteropogon* and *Rytidosperma* were recorded For forbs – *Calotis* and *Rhodanthe* were recorded For shrubs –*Maireana* and *Atriplex* were recorded.	For grasses – *Austrostipa, Enteropogon, Rytidosperma* and *Chloris* were recorded For forbs – *Bulbine, Rhodanthe and Sida* were recorded For shrubs –*Maireana* was recorded.	For grasses – *Austrostipa, Enteropogon* and *Rytidosperma* were recorded For forbs – *Calotis, Rhodanthe and Sida* were recorded For shrubs –*Maireana* and *Atriplex* were recorded.	For grasses – *Austrostipa, Enteropogon* and *Rytidosperma* were recorded For forbs – *Calotis* and *Rhodanthe* were recorded. For shrubs- For shrubs – *Maireana* and *Atriplex* were recorded.
Trees and large shrubs (>1m tall) are generally absent to sparse, amounting to less than 10 per cent projective foliage cover. Where woodlands overlap or adjoin with the ecological community an outer boundary of two times the canopy width of the dominant tree species is applied.	Trees and large shrubs were absent.	Trees and large shrubs were absent.	Trees and large shrubs were absent.	Trees and large shrubs were absent.	Trees and large shrubs were absent.	Trees and large shrubs were absent.	Trees and large shrubs were absent.
The patch should contain at least as many, preferably more, of the species in Table 1(A) than in Table 1(B) of the listing advice, when assessed at an appropriate time (e.g. late winter-spring and not soon after disturbance such as grazing). The species in Table 1(A) are characteristic of the natural grassland ecological community and not derived grasslands, and the opposite applies to Table 1(B). Note this generally only applies to grasslands occurring in the Lachlan (RIV 1) and Murrumbidgee (RIV 2) IBRA subregions.	Plot recorded in October. Of the 9 native species recorded 4 occur in Table 1 (A) and 1 occurs in Table 1 (B).	Plot recorded in August. Of the 18 native species recorded 4 occur in Table 1 (A) and 3 occur in Table 1 (B).	The plot was not recorded during an appropriate time of year for assessment (recorded in February). Associated patch of vegetation retained for assessment.	Plot recorded in October. Of the 16 native species recorded 1 occurs in Table 1 (A) and 3 occur in Table 1 (B). However, vegetation was subject to recent grazing in August by domestic livestock, reducing the abundance of annual herbs. Associated patch of vegetation retained for assessment.	Plot recorded in October. Of the 19 native species recorded 0 occur in Table 1 (A) and 4 occur in Table 1 (B).	Plot recorded in August. Of the 20 native species recorded 2 occur in Table 1 (A) and 5 occur in Table 1 (B). However, vegetation was subject to active grazing by domestic livestock reducing the abundance of annual herbs. Associated patch of vegetation retained for assessment.	Plot recorded in October. Of the 12 native species recorded 1 occur in Table 1 (A) and 2 occur in Table 1 (B). However, vegetation was subject to active grazing by domestic livestock reducing the abundance of annual herbs. Associated patch of vegetation retained for assessment.
If there is reliable evidence (e.g. historical records, photographs) that a patch was once woodland or shrubland with >10 per cent cover (of trees, shrubs >1m), then the patch is not considered to be part of the ecological community.	There is no evidence that the patch was once a woodland or shrubland	There is no evidence that the patch was once a woodland or shrubland	There is no evidence that the patch was once a woodland or shrubland	There is no evidence that the patch was once a woodland or shrubland	There is no evidence that the patch was once a woodland or shrubland	There is no evidence that the patch was once a woodland or shrubland	There is no evidence that the patch was once a woodland or shrubland
Soil type and landscape position (e.g. Alluvial soils, plains) that correspond with the ecological community and no other vegetation types may also assist in identifying the likely occurrence of natural grasslands ecological community.	The patch occurs on alluvial soils associated with a broad plain.	The patch occurs on alluvial soils associated with a broad plain.	The patch occurs on alluvial soils associated with a broad plain.	The patch occurs on alluvial soils associated with a broad plain.	The patch occurs on alluvial soils associated with a broad plain.	The patch occurs on alluvial soils associated with a broad plain.	The patch occurs on alluvial soils associated with a broad plain.
Outcome	**Meets Step 1 – key diagnostic characteristics**	**Meets Step 1 – key diagnostic characteristics**	**Meets Step 1 – key diagnostic characteristics**	**Meets Step 1 – key diagnostic characteristics**	**Does not meet Step 1- key diagnostic characteristics**	**Meets Step 1 – key diagnostic characteristics**	**Meets Step 1 – key diagnostic characteristics**

Table 4.9 Assessment Step 2: Determine condition of the ecological community for representative patches assigned to PCT 45 – Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion and PCT 46 – Curly Windmill Grass – speargrass – wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion that meet Step 1 key diagnostic characteristics

PCT & Condition	**PCT 45 – Moderate-good**		**PCT 46 – Moderate-good**			
Condition thresholds	**Q193E (PEC)**	**Q196E (PEC)**	**VNI_DR10**	**VNIOZ_11**	**VNI_DR64**	**VNI_DR88**
For all patches of the ecological community. The percentage cover of native vascular plants (annual and perennial) in the patch is greater than the percentage cover of perennial exotic species. AND Either category A or category B thresholds are met as below	Meets threshold. Native vascular cover was recorded at 79.5% with perennial exotic cover recorded at 0%.	Meets threshold. Native vascular cover was recorded at 75.6% with perennial exotic cover recorded at 0%.	Meets threshold. Native vascular cover was recorded at 72.5% with perennial exotic cover recorded at 0%.	Meets threshold. Native vascular cover was recorded at 85% with perennial exotic cover recorded at 0%.	Meets threshold. Native vascular cover was recorded at 77.8% with perennial exotic cover recorded at 0%.	Meets threshold. Native vascular cover was recorded at 76.8% with perennial exotic cover recorded at 0%.
Category A. For patches with high diversity or that are relatively undisturbed. This recognises that many patches of the ecological community can maintain their diversity despite the highly fragmented nature of the community or small patch sizes: A1. 15 or more vascular plant species are present in the patch. AND A2. The patch contains one or more indicator species in Table 2, characteristic of sites that are relatively undisturbed (e.g. have little to no history of cultivation). AND Patch size: A3. The size of the grassland patch is at least 0.04 ha or more in size (i.e. at least 400 m^2 or a 20 m x 20 m square or equivalent area in any shape.	A1. Meets condition threshold with 19 native vascular plant species recorded. A2. Meets condition threshold with seven indicator species recorded being*: Calotis anthemoides, Goodenia pusilliflora, Maireana enchylaenoides, Maireana excavata, Maireana humillima, Maireana pentagona* and *Rhodanthe pygmaea.* A3. Meets condition threshold with patch size exceeding 0.04 ha (patch size >4 ha).	A1. Meets condition threshold with 18 native vascular plant species recorded. A2. Meets condition threshold with six indicator species recorded being: *Goodenia pusilliflora, Maireana excavata, Maireana humillima, Maireana pentagona Triptilodiscus pygmaeus* and *Rhodanthe pygmaea.* A3. Meets condition threshold with patch size exceeding 0.04 ha (patch size >20 ha).	A1. Meets condition threshold with 20 native vascular plant species recorded. A2. Meets condition threshold with four indicator species recorded being*: Sida trichopoda, Asperula conferta, Maireana aphylla* and *Calotis scabiosifolia.* A3. Meets condition threshold with patch size exceeding 0.04 ha (patch size >30 ha).	A1. Meets condition threshold with 20 native vascular plant species recorded. A2. Meets condition threshold with four indicator species recorded being*: Sida trichopoda, Asperula conferta, Maireana aphylla* and *Calotis scabiosifolia.* A3. Meets condition threshold with patch size exceeding 0.04 ha (patch size >150 ha).	A1. Meets condition threshold with 19 native vascular plant species recorded. A2. Meets condition threshold with four indicator species recorded being: *Leucochrysum molle and Maireana aphylla.* A3. Meets condition threshold with patch size exceeding 0.04 ha (patch size >40 ha).	A1. Does not meet condition threshold with only 12 native vascular plant species. A2. Meets condition threshold with four indicator species recorded being: *Leiocarpa panaetioides, Maireana pentagona, Maireana aphylla* and *Calotis scabiosifolia*. A.3. Meets condition threshold with patch size exceeding 0.04 ha (patch size >40 ha).
Category B. For larger patches that have good ground layer diversity: This applies where patches of the ecological community do not meet the high diversity or lack or disturbance criteria in Category A but still retain sufficient elements of their natural diversity. Ground layer diversity: B1. 10 or more native vascular plant species are present in the patch. AND Patch size: B2. The size of the grassland patch is at least 1 ha or more in size (i.e. at least 10,000 m^2 or a 100 m x 100 m square or equivalent area in any shape).	Already meets Category A.	Already meets Category A.	Already meets Category A.	Already meets Category A	Already meets Category A.	B1. Meets condition threshold with 12 native vascular plant species. B2. Meets condition threshold. Size of grassland patch exceeds 1.0 ha (patch size >40 ha)
Outcome	**Meets Step 2 (Category A) – condition threshold and forms part of the ecological community.**	**Meets Step 2 (Category A) – condition threshold and forms part of the ecological community.**	**Meets Step 2 (Category A) – condition threshold and forms part of the ecological community.**	**Meets Step 2 (Category A) – condition threshold and forms part of the ecological community.**	**Meets Step 2 (Category A) – condition threshold and forms part of the ecological community.**	**Meets Step 2 (Category B) – condition threshold and forms part of the ecological community.**

Table 4.10 Summary of Natural Grasslands TEC within the Indicative disturbance footprint

Threatened ecological community	Vegetation type	IBRA subregion	Veg zone name (BAM-c)	Impact (ha)
Natural Grasslands of the Murray Valley Plains	PCT 44	Murray Fans	VZ SVTM	0.01
		Murrumbidgee	VZ 19 Moderate-good	15.16
			VZ 36 SVTM	0.19
	PCT 45	Murrumbidgee	VZ 20 Moderate-good	3.50
	PCT 46	Murrumbidgee	VZ 21 Moderate-good	48.13
			VZ 44 SVTM	14.06
Total				**81.05**

4.1.4 Plains mallee box woodlands of the Murray Darling Depression, Riverina and Naracoorte Coastal Plain Bioregions – Critically Endangered

PCT 170 is aligned with the Plains mallee box woodlands of the Murray Darling Depression, Riverina and Naracoorte Coastal Plain Bioregions TEC (hereafter Plains Box woodlands) listed as Critically Endangered under the EPBC Act.

This TEC is described in the Conservation Advice as a medium (five to 10 metres) to tall (15 metres) open mallee eucalypt woodland with a sparse or open Mallee box-barked eucalypt dominant canopy. Black Mallee Box (*Eucalyptus porosa*) and Bull Mallee (*E. behriana*) being most common, however they are rarely sympatric. A very sparse small tree or large – medium shrub layer may be present. A sub-shrub layer of low chenopods can be a distinguishing feature of this community, with species including Bitter Saltbush (*Atriplex stipitate subsp. stipitata*), Frosted Goosefoot *(Chenopodium desertorum*), Nodding Saltbush (*Einadia nutans subsp. nutans*), Ruby Saltbush (*Enchylaena tomentosa*), Bluebush species (*Maireana spp.*), Hedge Saltbush *(Rhagodia spinescens*), Grey Copperburr (*Sclerolaena diacantha*) and Tangled Copperburr (*S. muricata*). During relatively wet years the understorey is also dominated by tussock grasses including Speargrass (*Austrostipa* spp.), Common Wallaby Grass (*Rytidosperma caespitosum*), Brown-back Wallaby Grass (*R. duttonianum*), Curly Windmill Grass (*Enteropogon acicularis*) and Knottybutt Grass (*Paspalidium constrictum*).

Occurring within the Murray Darling Depression bioregion, Riverina bioregion and Naracoorte Coastal Plain, this ecological community is found on near-level or gently sloping plains. It is associated with medium-heavy textured soils, typically clay loams and occasionally sandy clay loams or light clays. Distributed within semi-arid to arid regions, the mean annual rainfall associated with this community is 260–450 millimetres. A functionally important component of this community, the biological soil crust can reach up to 60 per cent ground cover of mosses, lichens, liverworts, cyanobacteria, algae and fungi.

The ecological community can be broadly categorised into three variants. Variant 1 is structurally dominated by *E. behriana*, Variant 2 by *E, porosa* and Variant 3 by *E. dumosa*. Condition classes, indicators and thresholds are outlined within the TEC Conservation Advice (Department of Agriculture, Water and the Environment 2021).

Within the amended project Indicative disturbance footprint patches of PCT 170 – Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones were inspected to determine if the ecological community occurred.

A comparison of the listing advice for Plains mallee box woodland and candidate PCT patches is provided in Table 4.11. Each element of the listing advice including locality, species composition, characteristic species and resilience is compared to each condition class for the candidate PCT to determine if vegetation recorded is consistent with the listing criteria. No patches of PCT 170 have been determined to meet the listing criteria.

Table 4.11 Assessment of EPBC Act listed Plains mallee box woodland and associated recorded vegetation

PCT 170 Condition:	**Thinned**		**Derived**		
Listing advice	**NM019**	**NM020**	**VNI MP 28**	**VNI MP 29**	**VNI MP 30**
Does the PCT occur in south-west NSW, north-west Victoria and south-east South Australia including the following bioregions, Murray Darling Depression, Riverina and Naracoorte Coastal Plain Bioregions?	Yes This PCT was recorded to occur in the Murray Darling Depression IBRA Bioregion in south-west NSW (Murrumbidgee IBRA subregion).	Yes This PCT was recorded to occur in the Murray Darling Depression IBRA Bioregion in south-west NSW (Murrumbidgee IBRA subregion).	Yes This PCT was recorded to occur in the Murray Darling Depression IBRA Bioregion in south-west NSW (Murrumbidgee IBRA subregion).	Yes This PCT was recorded to occur in the Murray Darling Depression IBRA Bioregion in south-west NSW (Murrumbidgee IBRA subregion).	Yes This PCT was recorded to occur in the Murray Darling Depression IBRA Bioregion in south-west NSW (Murrumbidgee IBRA subregion).
Does the PCT occur as a medium to tall open mallee eucalypt woodland with a canopy typically dominated by 'mallee box' *Eucalyptus* species and an understorey in which tussock grasses may be prominent in relatively wet years, low chenopod shrubs occur in variable densities, and taller shrubs are typically sparse?	No. PCT is not comprised of 'mallee box' Eucalyptus species.	No. PCT is not comprised of 'mallee box' Eucalyptus species.	No. Lacking a canopy therefore excluded from further assessment.	No. Lacking a canopy therefore excluded from further assessment.	No. Lacking a canopy therefore excluded from further assessment.
Does the PCT occur in association with relatively medium-heavy textured soils on near-level to gently sloping plains? Typically, soils are heavier in texture than soils that support most other mallee communities but have a lower fraction of clay than soils supporting saltbush shrublands and black box woodlands.	Not assessed due to not meeting above criteria.	Not assessed due to not meeting above criteria.	Excluded from further assessment.	Excluded from further assessment.	Excluded from further assessment.
Canopy species and composition Is the canopy between 5–15 m tall with a typical cover ranging from 10–15 per cent (spare to open canopy)? AND Variant 1 – dominated by *Eucalyptus behriana* Variant 2 – dominated by *Eucalyptus porosa* Variant 3 – dominated by *Eucalyptus dumosa* in areas where the understorey or other characteristics are consistent with the ecological community (i.e. would not occur on sand dunes where *Triodia scariosa* subsp. *scariosa* is prominent). Note: *Eucalyptus odorata* may be codominant in some areas. *Allocasuarina luehmannii* and *Casuarina pauper* can also be locally abundant, but not dominant across an entire patch.	No. Canopy does not consist of any of the key variant Eucalyptus species.	No. Canopy does not consist of any of the key variant Eucalyptus species.	Excluded from further assessment. Absence of trees therefore excluded from further assessment.	Excluded from further assessment. Absence of trees therefore excluded from further assessment.	Excluded from further assessment. Absence of trees therefore excluded from further assessment.
Small tree and large shrub canopy species and composition Does the patch contain a typically low (3–4 m) small tree and/or shrub layer that is very sparse (<5 per cent cover)? A medium shrub layer may also be present but is normally very sparse (<10 per cent). AND Contain characteristic species provided in paragraph 2.1.4.2 of the listing advice?	No. Absence of trees therefore excluded from further assessment.	No. Absence of trees therefore excluded from further assessment.	No. Absence of trees therefore excluded from further assessment.	No. Absence of trees therefore excluded from further assessment.	No. Absence of trees therefore excluded from further assessment.
Low shrub and ground layer species Does the patch have a distinct low to decumbent chenopod sub-shrub layer with a ground layer that is dominated by tussock grasses (possibly inconspicuous depending on drought conditions and grazing pressures)? AND Contain characteristic species provided in paragraph 2.1.4.3 of the listing advice?	Not assessed due to not meeting above criteria.	Not assessed due to not meeting above criteria.	Not assessed due to not meeting above criteria.	Not assessed due to not meeting above criteria.	Not assessed due to not meeting above criteria.
Outcome	**Does not meet key characteristics and condition threshold. Does not form part of the ecological community**	**Does not meet key characteristics and condition threshold. Does not form part of the ecological community**	**Does not meet key characteristics and condition threshold. Does not form part of the ecological community**	**Does not meet key characteristics and condition threshold. Does not form part of the ecological community**	**Does not meet key characteristics and condition threshold. Does not form part of the ecological community**

4.1.5 *Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains – Critically Endangered*

Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains (hereafter referred to as Seasonal Herbaceous Wetlands) is listed Critically Endangered under the EPBC Act. This TEC comprises of wetland species that have adapted to seasonal drying and wetting or waterlogged conditions occurring on the lowland plains of temperate south-eastern Australia from Victoria, south-eastern South Australia and southern New South Wales.

Within the Indicative disturbance footprint, one vegetation type was considered likely to associate with this threatened ecological community being, PCT 47 – Swamp grassland wetland of the Riverine Plain. Vegetation associated with this PCT has been recorded during field validation surveys undertaken for the amended project, during field validation surveys undertaken for the EnergyConnect (NSW – Eastern section) project (WSP, 2022) and as part of the SVTM.

A summary of relevant Commonwealth guidelines and policy statements available for this TEC is as follows:

- *Approved Conservation Advice for the Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains.* (DSEWPC, 2012a). In effect under the EPBC Act from 27 March 2012.
- *Commonwealth Listing Advice on Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains.* (TSSC, 2012b). In effect under the EPBC Act from 27-Mar-2012.

A comparison of the listing advice for Seasonal Herbaceous Wetlands and candidate PCT is provided in Table 4.12 and Table 4.13. Each element of the listing advice including locality, species composition, characteristic species and resilience is compared to each condition class for the candidate PCT to determine if vegetation recorded is consistent with the listing criteria. For areas not subject to field verification survey (SVTM), vegetation is assumed to meet both the key characteristics and condition thresholds for the community excluding Part C: Minimum Wetland Size of the condition thresholds. An analysis of Part C: Minimum Wetland Size has been undertaken for all areas of SVTM has been undertaken and is provided below in Table 4.14. Where candidate PCTs have been identified as part of the EnergyConnect project (NSW – Eastern section), data has been extracted from the Revised BDAR and utilised in this assessment (WSP, 2022).

A summary of Seasonal Herbaceous Wetlands ecological community, associated PCT and extent within the Indicative disturbance footprint for each IBRA subregion is summarised in Table 4.15. The location of Seasonal Herbaceous Wetlands in relation to the Indicative disturbance footprint is provided in Figure 15.9 of the Revised BDAR.

Table 4.12 Assessment Step 1: use key diagnostic characteristics to identify if the ecological community is present for representative patches assigned to PCT 47 – Swamp grassland wetland of the Riverine Plain

Key diagnostic characteristics	PEC – Q194E
Landscape Limited to the temperate zones of mainland south – eastern Australia. The ecological community occurs in south – east SE, Victoria and southern NSW. On flat plains grading into slopes, below 500 m asl. Associated soils are generally fertile but poorly draining clays derived from arrange of geologies. Typically, in rainfall zones with a Winter seasonal rainfall pattern, extending into uniform seasonal rainfall pattern at the edge of its range. The mean annual rainfall is usually 400 to 800 mm/year but can be lower at the northern edge of its range.	Meets key diagnostic characteristics: Located in the Riverina (Murrumbidgee subregion) IBRA bioregion which occurs in southern NSW. Occurs on a flat plain at <500 m elevation (about 125 m in elevation). Occurs on poorly draining grey cracking clay. Locality falls within a winter seasonal rainfall period which accumulates an average of about 400 mm of rain per annum.

Key diagnostic characteristics	PEC – Q194E
Did Hydrology On isolated drainage lines or depressions which are seasonally inundated (typically during winter-spring) and subsequently dry (typically by late summer). Rainfall is the main water source. These wetlands are not dependant on overbank flooding from riverine systems.	Meets key diagnostic characteristics: Occurs in isolated drainage lines and depressions that inundate with water following periods of winter rain. Rainfall is the main water source.
Biota Trees and shrubs are sparse to absent. When present, they mostly occur as fringing or scattered individuals. The cover of woody species accounts for no more than 10 per cent projective foliage cover across the wetland. The vegetative cover of the ecological community is dominated by a ground layer of native wetland graminoids and/or native wetland forbs A range of graminoids is often present and typically includes one or more of the following taxa: *Amphibromus* spp., *Carex tereticaulis, Deyeuxia* spp., *Glyceria* spp., *Lachnagrostis* spp., *Poa labillardieri* and *Rytidosperma duttonianum*. Note that other graminoid taxa may also occur, though are not necessarily common – refer to Appendix A of the listing advice for a plant species list. Freshwater algae often are present when the wetland is, or recently has been, wet.	Meets key diagnostic characterises: Trees were absent with scattered occurrences of *Duma florulenta* which did not exceed 10 per cent projected foliage cover (recorded as 1 per cent cover). Five native wetland graminoid species listed in Appendix A of the listing advice were recorded with a cover of 58.2 per cent and included *Juncus flavidus, Juncus radula, Lachnagrostis filiformis, Rytidosperma duttonianum* and *Walwhalleya proluta*; while 1 native wetland forb, *Swainsona procumbens*, was recorded with a cover of 0.1. Note sampling occurred prior to inundation by winter rains causing a reduction in forb richness. No algae was recorded; however, sampling occurred prior to inundation by winter rains.
Modified wetlands Modifications to other types of wetlands may result in the ecological community being present where it was formerly absent. These modified wetland sites are included as part of the national ecological community, if they remain a functional natural wetland and conform to the description of the ecological community.	N/A – there is no evidence of modification to the sample site.
Outcome	**Meets step 1 – key diagnostic characteristics**

Table 4.13 Assessment Step 2: Determine condition of the ecological community for representative patches assigned to PCT 47 – Swamp grassland wetland of the Riverine Plain

Condition thresholds	PEC – Q194E
Part A: Condition during 'typical' wet cycles. This is likely to occur in most years. It is best applied when the wetlands are inundated, or recently wet within a season, noting that some taxa may not have become apparent after recent filling. A1. Is the wetland consistent with the key diagnostics, noted above? AND A2. Is 50 per cent or more of the total cover of plants in the ground layer of the wetland dominated by native species characteristic of the Seasonal Herbaceous Wetlands ecological community?	A1. Meets condition threshold as sample meets the key diagnostic characteristics. A2. Six native wetland graminoid and forb species were recorded with a cover of 79.3 per cent.
Part B: To determine if the ecological community occurs at sites where there has been a prolonged dry period (e.g. drought of longer than a year)	Sample not taken during prolonged dry period; Part A conditions apply.
Part C: Minimum wetland size. The ecological community is naturally fragmented and occurs as discrete, often small wetlands. Figure 1 of the listing advice should be considered when assessing minimum size requirements. The following conditions apply. — Isolated wetland in a landscape – size must be at least 0.5 ha. — Wetland occurs as a cluster of many small wetlands in reasonably close proximity (e.g. gilgais) – the collective area of wetlands within the cluster must be at least 0.5 ha AND the total area of the wetland proper accounts for 10 per cent or more of the total cluster area. — Wetland is connected to, or part of, a native vegetation remnant and wetland or wetland cluster is < 0.5 ha – the actual wetland or wetland cluster is at least 0.1 ha AND the wetland is contiguous with a native vegetation remnant AND the total area of the wetland plus other native vegetation is at least 1 ha.	Meets condition threshold. Occurs as an isolated wetland with a patch size > 0.5 ha (patch size is about 2 ha).
Part D: Very high-quality wetlands. Used to determine whether the wetland is of very high quality based on presence of three or more indicator plant species listed in Table 1 of the listing advice. Not used to determine whether the community occurs.	One species listed in Table 1 was recorded, *Swainsona procumbens*, however the sample was recorded before inundation by winter rains causing a reduction in species richness.
Outcome	**Meets Step 2 (Category A) – condition threshold and forms part of the ecological community**

Table 4.14 Analysis of Part C: Minimum wetland size for areas not subject to survey

Condition threshold	SVTM – Dinawan substation
Part C: Minimum wetland size. The ecological community is naturally fragmented and occurs as discrete, often small wetlands. Figure 1 of the listing advice should be considered when assessing minimum size requirements. The following conditions apply. — Isolated wetland in a landscape – size must be at least 0.5 ha. — Wetland occurs as a cluster of many small wetlands in reasonably close proximity (e.g. gilgais) – the collective area of wetlands within the cluster must be at least 0.5 ha AND the total area of the wetland proper accounts for 10 per cent or more of the total cluster area. — Wetland is connected to, or part of, a native vegetation remnant and wetland or wetland cluster is < 0.5 ha – the actual wetland or wetland cluster is at least 0.1 ha AND the wetland is contiguous with a native vegetation remnant AND the total area of the wetland plus other native vegetation is at least 1 ha.	Meets condition threshold. Wetland is connected to native vegetation remnant with a collective wetland cluster size of approximately 60 ha and accounting for approximately 12 per cent of the total cluster area.
Outcome	**Meets Step 2 Part C – condition threshold and forms part of the ecological community**

Table 4.15 Summary of Seasonal Herbaceous Wetlands threatened ecological community within the indicative disturbance footprint

Threatened ecological community	Vegetation type	IBRA subregion	Veg zone name (BAM-C)	Impact (ha)
Seasonal Herbaceous Wetlands	PCT 47 – Swamp grassland wetland of the Riverine Plain	Murrumbidgee	VZ 22 Moderate-good	0.19
Total				**0.19**

4.1.6 Weeping Myall Woodlands – Endangered

Weeping Myall Woodlands TEC is listed as Endangered under the EPBC Act. This TEC is described in the Listing Advice as an open woodland to woodland, with a sole or dominant overstorey, four to 12 metres high, of Weeping Myall (*Acacia pendula*) featuring commonly occurring Grey Mistletoe (*Amyema quandang*). Other trees that may occur, although would not dominate, include Western Rosewood (*Alectryon oleifolius* subsp. *elongatus*), Poplar Box (*Eucalyptus populnea*) and Blackbox (*E. largiflorens*). An open shrub layer and open ground layer of grasses and herbs is common. While this community can be a shrubby woodland, disturbance and dieback have led to a primarily grassy understorey.

This ecological community occurs on the inland alluvial plains west of the Great Dividing Range in NSW and Queensland, and one patch in northern Victoria. It occurs in the Riverina, NSW South Western Slopes, Darling Riverine Plains, Brigalow Belt South and North, Murray-Darling Depression, Nandewar and Cobar Peneplain bioregions. Associated with flat areas, shallow depressions or gilgais on raised alluvial plains that are rarely if ever flooded, this community occurs on arable land of black, brown, red-brown, or grey clay or clay loam soils.

Regular cycles of senescence and regeneration are a feature of Weeping Myall, which is also susceptible to defoliation by Bag-shelter Moth (*Ochrogaster lunifer*) contributing to the potential for a living, defoliated or dead state of this dominant tree. The death of canopy trees is therefore not considered to be an indicator of poor condition. Derived grasslands are not included in this listing, as it is not possible to determine whether existing grasslands and shrublands were previously associated with Weeping Myall.

Within the Indicative disturbance footprint one vegetation type was considered likely to associate with this threatened ecological community being, PCT 26 – Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion. Vegetation associated with this PCT has been mapped during field validation surveys undertaken for the amended project, during field validation surveys undertaken for the EnergyConnect (NSW – Eastern section) project (WSP, 2022) and as part of the SVTM.

A summary of relevant Commonwealth guidelines and policy statements available for this TEC is as follows:

- *Approved Conservation Advice for Weeping Myall Woodlands ecological community*. (DEWHA, 2008). In effect under the EPBC Act from 07 January 2009.
- *Commonwealth Listing Advice on Weeping Myall Woodlands*. (Threatened Species Scientific Committee, 2009). In effect under the EPBC Act from 07 January 2009.

For a vegetation patch to meet the threatened ecological listing of Weeping Myall Woodlands it must meet specific listing advice key characteristics and condition threshold criteria as outlined in Figure 4.3. An assessment of this key diagnostic characteristics and condition threshold criteria against recorded plot data is presented in Table 4.16. Where candidate PCTs have been identified by SVTM, vegetation has been assumed to meet benchmark conditions outlined in BioNet Vegetation Classification system for the purposes of this assessment and are considered to meet minimum requirements for Myall Woodlands TEC. Where candidate PCTs have been identified as part of EnergyConnect (NSW – Eastern section) project, data has been extracted from the Revised BDAR and utilised in this assessment (WSP, 2022).

A summary of Weeping Myall Woodlands ecological community, associated PCT and extent within the Indicative disturbance footprint for each IBRA subregion is summarised in Table 4.17.The location of Weeping Myall Woodlands in relation to the amended project Indicative disturbance footprint is provided in Figure 15.9 of the Revised BDAR.

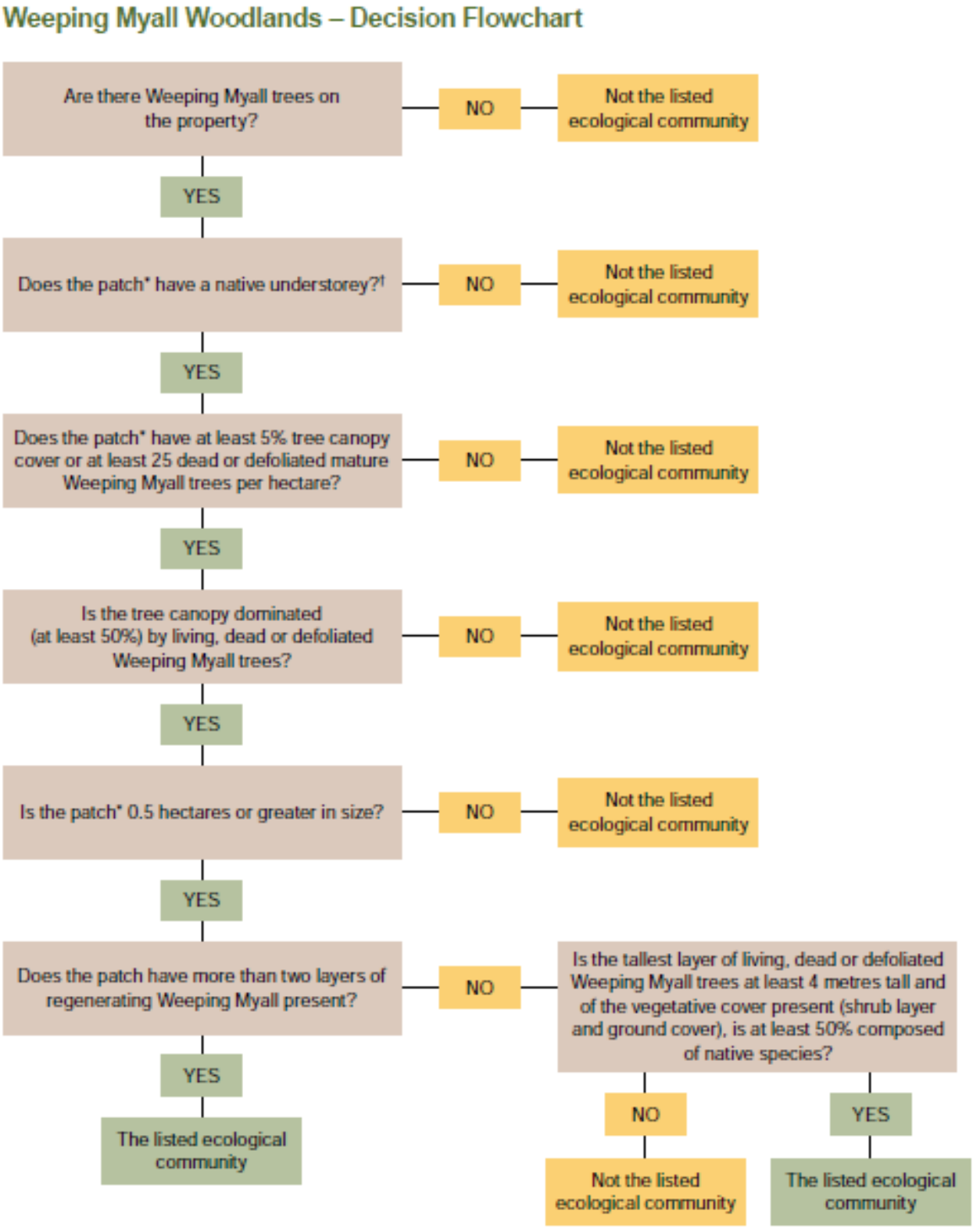


Figure 4.3 Listing advice key characteristics and condition threshold criteria for Weeping Myall Woodlands

Table 4.16 Assessment of EPBC Act listed Weeping Myall Woodlands and associated recorded vegetation in PCT 26

Listing advice	PCT 26_Moderate-good							PCT 26_Thinned				PCT 26_River Red Gum	PCT 26_Planted NatVeg
	VNI_DR02	VNI_DR07	VNI_DR08	VNI_DR62	VNI_DR73	VNI_DR85	PEC – Q197E	VNI_DR29	VNI_DR30	VNI_DR83	VNI_DR84	VNI_DR61	VNI_DR120
The tree canopy is dominated (at least 50% of trees present) by living, dead or defoliated Weeping Myall trees	Meets criteria. *Acacia pendula* was the only recorded tree species.	Meets criteria. *Acacia pendula* was the only recorded tree species.	Meets criteria. *Acacia pendula* comprise 70% of the tree canopy cover.	Meets criteria. *Acacia pendula* was the only recorded tree species.	Meets criteria. *Acacia pendula* was the only recorded tree species.	Meets criteria. *Acacia pendula* was the only recorded tree species.	Meets criteria. *Acacia pendula* was the only recorded tree species.	Meets criteria. *Acacia pendula* was the only recorded tree species.	Meets criteria. *Acacia pendula* was the only recorded tree species.	Meets criteria. *Acacia pendula* was the only recorded tree species.	Meets criteria. *Acacia pendula* was the only recorded tree species.	Does not meet criteria. *Eucalyptus camaldulensis* was the only recorded tree species	Does not meet criteria. *Eucalyptus* spp. Was recorded in the tree canopy.
The patch has a predominantly native understorey (>50%).	Meets criteria. The patch has >50% native cover in the understorey (native cover recorded at 97%)	Meets criteria. The patch has >50% native cover in the understorey (native cover recorded at 100%)	Meets criteria. The patch has >50% native cover in the understorey (native cover recorded at 89.1%)	Meets criteria. The patch has >50% native cover in the understorey (native cover recorded at 99.4%)	Meets criteria. The patch has >50% native cover in the understorey (native cover recorded at 88.3%)	Meets criteria. The patch has >50% native cover in the understorey (native cover recorded at 91.4%)	Meets criteria. The patch has >50% native cover in the understorey (native cover recorded at 71%)	Meets criteria. The patch has >50% native cover in the understorey (native cover recorded at 96.2%)	Meets criteria. The patch has >50% native cover in the understorey (native cover recorded at 98%)	Meets criteria. The patch has >50% native cover in the understorey (native cover recorded at 52.2%)	Meets criteria. The patch has >50% native cover in the understorey (native cover recorded at 60.8%)	Does not meet criteria. The patch has <50% native cover in the understorey (native cover recorded at 30.9%)	Meets criteria. The patch has >50% native cover in the understorey (native cover recorded at 100%)
The overstorey must have at least 5% tree canopy cover or at least 25 dead or defoliated mature Weeping Myall trees/ha	Meets criteria. >5% tree canopy cover (recorded to be 5%)	Meets criteria. >5% tree canopy cover (recorded to be 20%)	Meets criteria. >5% tree canopy cover (recorded to be 7%)	Meets criteria. >5% tree canopy cover (recorded to be 20%)	Meets criteria. <5% tree canopy cover, however area subject to Bag Moth infestation. Tree canopy cover reviewed based on aerial imagery and deemed >5% cover at patch level.	Meets criteria. >5% tree canopy cover (recorded to be 5%)	Meets criteria. >5% tree canopy cover (recorded to be 5%)	Does not meet criteria. <5% tree canopy cover (recorded to be 2% with <25 mature trees/ha). However, area subject to Bag Moth infestation. Tree canopy cover reviewed based on aerial imagery and deemed <5% cover at patch level.	Does not meet criteria. <5% tree canopy cover (recorded to be 2% with <25 mature trees/ha). However, area subject to Bag Moth infestation. Tree canopy cover reviewed based on aerial imagery and deemed <5% cover at patch level.	Does not meet criteria. <5% tree canopy cover (recorded to be 2% with <25 mature trees/ha). However, area subject to Bag Moth infestation. Tree canopy cover reviewed based on aerial imagery and deemed <5% cover at patch level.	Does not meet criteria. <5% tree canopy cover (recorded to be 3% with no mature trees/ha). However, area subject to Bag Moth infestation. Tree canopy cover reviewed based on aerial imagery and deemed <5% cover at patch level.	Meets criteria. >5% tree canopy cover (recorded to be 5%)	Does not meet criteria. <5% tree canopy cover (recorded to be 2%) with no presence of Weeping Myall.
The area is at least 0.5 ha in size	Meets criteria. Patch size >4 ha.	Meets criteria. Patch size >4 ha.	Meets criteria. Patch size >15 ha.	Meets criteria. Patch size >60 ha.	Meets criteria. Patch size >30 ha.	Meets criteria. Patch size >100 ha.	Meets criteria. Patch size >40 ha.	Meets criteria. Patch size >200 ha.	Meets criteria. Patch size >20 ha.	Meets criteria. Patch size >80 ha.	Meets criteria. Patch size >10 ha.	Meets criteria. Patch size >5 ha.	Does not meet criteria. Patch size 0.3 ha.

Listing advice	PCT 26_Moderate-good							PCT 26_Thinned				PCT 26_River Red Gum	PCT 26_Planted NatVeg
	VNI_DR02	VNI_DR07	VNI_DR08	VNI_DR62	VNI_DR73	VNI_DR85	PEC – Q197E	VNI_DR29	VNI_DR30	VNI_DR83	VNI_DR84	VNI_DR61	VNI_DR120
The patch has either: more than two layers of regeneration of Weeping Myall present OR the tallest layer of living, dead or defoliated Weeping Myall trees is at least 4 m tall and of the vegetative cover present, 50% is comprised of native species	Meets criteria More than two layers of regeneration of Weeping Myall recorded.	Meets criteria More than two layers of regeneration of Weeping Myall recorded.	Meets criteria More than two layers of regeneration of Weeping Myall recorded.	Meets criteria More than two layers of regeneration of Weeping Myall recorded.	Meets criteria More than two layers of regeneration of Weeping Myall recorded.	Meets criteria More than two layers of regeneration of Weeping Myall recorded.	Meets criteria. The tallest layer of Weeping Myall was recorded to be 8 m tall and of all the vegetation cover present, 56.3% is native.	Meets criteria No layers of regenerating Weeping Myall present. Tallest layer of Weeping Myall trees is >4 m (recorded at 5 m) and vegetation cover is >50% native (recorded at 96.4%).	Meets criteria More than two layers of regeneration of Weeping Myall recorded.	Meets criteria More than two layers of regeneration of Weeping Myall recorded.	Meets criteria More than two layers of regeneration of Weeping Myall recorded.	Does not meet criteria. No layers of regenerating Weeping Myall present. Vegetation cover is <50% native.	Does not meet criteria. Weeping Myall is not present.
Outcome	**Meets condition criteria – forms part of the ecological community**	**Meets condition criteria – forms part of the ecological community**	**Meets condition criteria – forms part of the ecological community**	**Meets condition criteria – forms part of the ecological community**	**Meets condition criteria – forms part of the ecological community**	**Meets condition criteria – forms part of the ecological community**	**Meets condition criteria – forms part of the ecological community**	**Does not meet condition criteria – does not form part of the ecological community.**	**Does not meet condition criteria – does not form part of the ecological community.**	**Does not meet condition criteria – does not form part of the ecological community.**	**Does not meet condition criteria – does not form part of the ecological community.**	**Does not meet condition criteria – does not form part of the ecological community.**	**Does not meet condition criteria – does not form part of the ecological community.**

Table 4.17 Summary of Weeping Myall woodlands threatened ecological community within the indicative disturbance footprint

Threatened ecological community	Vegetation type	IBRA subregion	Veg zone name (BAM-C)	Impact (ha)
Weeping Myall woodlands	PCT 26 – Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion	Murrumbidgee	VZ #13 Moderate-good	77.77
Total				**77.77**

4.1.7 White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland – Critically Endangered

PCTs 266 – White Box grassy woodland in the upper slopes subregion of the NSW South Western Slopes Bioregion and 277 – Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion are considered to form part of the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland TEC (hereafter Box Gum Woodland) listed as Critically Endangered under the EPBC Act.

This TEC is described as a medium height open grassy woodland, with typical tree height of 30 metres, lower (15 metres) in more arid areas. In a mature and relatively undisturbed state, individual tree canopies are separate with a projected foliage cover rarely exceeding 30 per cent. Dominant tree species include White Box (*Eucalyptus albens*), Yellow Box (*E. melliodora*) and Blakely's Red Gum (*E. blakelyi*). Scattered to sparse shrubs are characteristic of undisturbed sites. High condition sites feature Western Wattle (*Acacia decora*) and Silver Wattle (*Acacia dealbata*). These species may be replaced by Cassinia (*Cassinia spp*.) after prolonged grazing. Native Blackthorn (*Bursaria spinosa*) and peas (*Dillwynia, Eutaxia, Pultenaea and Templetonia*) are commonly present. A diverse mix of ground layer tussocky grasses and herbs are common in sites with minimal degradation. Species include: *Austrostipa, Bothriochloa, Chloris, Cymbopogon, Dichanthium, Microlaena, Poa, Themeda, Rytidosperma* or *Sorghum.* A range of broad-leaved forbs and petaloid monocots are additional major components to the ground layer diversity of this community.

The ecological community is broadly distributed in an arc along the western slopes and tablelands of the Great Dividing Range from Southern Queensland through NSW and ACT, to Victoria. It is known to occur on hilly to undulating landscapes, in areas with soils of moderate fertility derived from a range of lithologies, including alkaline and acid volcanics, granites, sediments, serpentinites and metamorphics. Average rainfall is generally between 400 and 900 millimetres annually, on moderate to highly fertile soils at altitudes between 170 metres to 1200 metres. This community grades into shrubby woodlands on decreasingly fertile soils.

Derived native grassland may remain in the absence of trees, due to their removal. Conversely, some sites experience a highly modified ground layer in the presence of a remnant tree layer. Sites lacking a predominantly native ground layer are not considered to be part of this TEC. Condition class criteria are outlined within the Approved Conservation Advice (Cth DCCEEW 2023).

PCT 266 and PCT 277 are found within the Wagga to Gugaa component of the amended project within the Inland Slopes IBRA subregion and are associated with Box Gum Woodland CEEC. Both PCT 266 and PCT 277 have been assessed against key criteria outlined in the listing advice for Box Gum Woodland (DEH, 2006). Areas of PCT 277 in moderate-good condition state have not been subject to detailed survey effort and are subject to benchmark condition outlined in BioNet Vegetation Classification system. As such, all patches of PCT 277 moderate-good are considered to meet the minimum requirement for the community and have not been assessed below. Additionally, vegetation associated with PCT 277 in Derived_No Offset condition state were not retained for further assessment due to their low vegetation integrity score, high percentage of exotic cover, lack of canopy trees, and lack of native overstorey regeneration.

The remaining condition states of PCT 266 and PCT 277 have been assessed for suitability against the key criteria in Table 4.18 and Table 4.19. A summary of Box Gum Woodland ecological community, associated PCT and extent within the Indicative disturbance footprint for each IBRA subregion is summarised in Table 4.20.

Table 4.18 Assessment of PCT 266

Listing advice	PCT 266 – Moderate-good
	VNI_DR108
1. Is, or was previously, at least one of the most common overstorey species; White Box, Yellow Box or Blakely's Red Gum (or Western Grey Box or Coastal Grey Box in the Nandewar Bioregion)?	Yes White Box and Blakley's Red Gum are the only overstorey species present.
2. Does the 'patch' have a predominantly native understorey (>50% perennial native cover)?	Yes The understorey is predominantly perennial native (recorded at 24.9% perennial native and 11.5% exotic.
3. Is the patch 0.1 ha or greater in size?	Yes The patch size is roughly 0.89 ha in size.
4(a). Are there 12 or more native understorey species present (excluding grasses)?	No The patch contained <12 native species excluding grasses (6 native species were recorded, a further 8 species were native grasses).
4(b). There must be at least one important species.	No No important species were recorded within this patch of vegetation.
For condition classes that do not meet criteria 1-4:	
5. Where patches do not meet the criteria 4a and 4b, is the patch 2 ha or greater in size?	Yes The patch is approximately 6 ha in size.
6. Does the 2-ha patch have 40 or more trees with a DBH >40cm? (i.e. 20 per ha) or is there natural regeneration of the dominant overstorey Eucalypts?	Yes Regeneration of the dominant overstorey Eucalyptus has been recorded.
Does the PCT meet the criteria for this TEC?	**Meets condition criteria – forms part of the ecological community.**

Table 4.19 Assessment of PCT 277

Listing advice	PCT 277 – Thinned		PCT 277 – Native Planting
	VNI_OZ19	VNI_DR113	Q33E
1. Is, or was previously, at least one of the most common overstorey species; White Box, Yellow Box or Blakely's Red Gum (or Western Grey Box or Coastal Grey Box in the Nandewar Bioregion)?	Yes Yellow Box and Blakely's Red Gum were the only overstorey species present.	Yes Blakely's Red Gum was the only overstorey species present.	Yes White Box and Blakely's Red Gum are dominant in the canopy.
2. Does the 'patch' have a predominantly native understorey (>50% perennial native cover)?	No The patch of vegetation has a predominantly exotic understorey (recorded at 31.6% exotic and 19.3% perennial native).	Yes The patch of vegetation has a predominantly perennial native understorey (recorded at 53.2% perennial native and 6.6% exotic).	No The patch of vegetation has a predominantly exotic understorey (recorded at 95.3% exotic and 4.7% perennial native).
3. Is the patch 0.1 ha or greater in size?	Yes The patch size is roughly 3.6 ha in size.	Yes The patch size is roughly 1.0 ha in size.	Yes The patch size is greater than 10 ha in size.
4(a). Are there 12 or more native understorey species present (excluding grasses)?	No There are 3 native species in the understorey excluding grasses. Survey done in February 2025.	No There are 2 native species in the understorey excluding grasses. Survey done in February 2025.	No There are no native understorey species excluding grasses.
4(b). There must be at least one important species.	No No important species were recorded within this patch of vegetation.	No No important species were recorded within this patch of vegetation.	No No important species were recorded.
For condition classes that do not meet criteria 1-4:			
5. Where patches do not meet the criteria 4a and 4b, is the patch 2 ha or greater in size?	Yes The patch size is roughly 3.6 ha in size.	Yes The patch size is roughly 8.5 ha in size.	Yes The patch size is over 10 ha in size.
6. Does the 2-ha patch have 40 or more trees with a DBH >40cm? (i.e. 20 per ha) or is there natural regeneration of the dominant overstorey Eucalypts?	Yes The patch has natural regeneration of the dominant overstorey Eucalypt species (*Eucalyptus melliodora*).	Yes The patch has more than 40 trees with a DBH >40 cm within a 2-ha patch (17 trees with a DBH >50 cm have been identified in a 20 x 50 m BAM VI plot).	No No trees with a DBH >40 cm were recorded in the 20 x 50 plot.
Does the PCT meet the criteria for this TEC?	**Meets condition criteria – forms part of the ecological community.**	**Meets condition criteria – forms part of the ecological community.**	**Does not meet condition criteria – does not form part of the ecological community.**

Table 4.20 Summary of Box Gum Woodlands threatened ecological community within Indicative disturbance footprint

Threatened ecological community	Vegetation type	IBRA subregion	Veg zone name (BAM-C)	Impact (ha)
White Box – Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grasslands	PCT 266 – White Box grassy woodland in the upper slopes subregion of the NSW South Western Slopes Bioregion	Inland Slopes	VZ #2 Moderate-good	0.09
	PCT 277 – Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	Inland Slopes	VZ #05 Thinned	2.26
			VZ #09 Moderate-good	0.34
Total				**2.69**

4.2 Threatened flora species

Database searches identified 29 threatened flora species listed under the EPBC Act with known or likely to occur within the amended project area or surrounding locality (10 km buffer area). Of these, five species were recorded within the Indicative disturbance footprint, with a further seven species identified as having a moderate or higher likelihood of occurrence (Attachment A) within the Indicative disturbance footprint (Table 4.21).

Table 4.21 Threatened flora likelihood of occurrence within the Indicative disturbance footprint

Scientific name	Common name	EPBC Act[1]	Likelihood
Amphibromus fluitans	Floating Swamp Wallaby-grass	V	**Moderate.** Records associated with the Murray River and tributaries. Habitat occurs in the Indicative disturbance footprint in the form of PCTs 11, 17 & 160.
Austrostipa metatoris	–	V	**Moderate.** Records associated with the Murray River Valley. Habitat occurs in the Indicative disturbance footprint in the form of PCTs 7 & 28.
Austrostipa wakoolica	–	E	**Moderate.** Records associated with the Murray River and tributaries. Habitat occurs in the Indicative disturbance footprint in the form of PCTs 17, 26, 28 & 237.
Brachyscome muelleroides	Mueller Daisy	V	**Moderate.** Habitat for the species is present within the Indicative disturbance footprint. Habitat occurs in the Indicative disturbance footprint in the form of PCTs 44, 45, 46 & 47.
Brachyscome papillosa	Mossgiel daisy	V	**Recorded.** Several populations recorded within the amended project footprint with additional associated habitat within the Indicative disturbance footprint. Habitat occurs in the Indicative disturbance footprint in the form of PCTs 13, 15, 24, 44, 45, 46, 157, 159, 160, 163, 164 & 216.

Scientific name	Common name	EPBC Act[1]	Likelihood
Eleocharis obicis	A spike rush	V	**Recorded.** Several populations of the species were recorded during targeted surveyed from recently inundated or inundated gilgais on light grey clays in chenopod shrublands and freshwater wetlands. Habitat occurs in the Indicative disturbance footprint in the form of PCTs 10, 11, 13, 17, 24, 47, 53, 157, 159, 160, 163, 164, 216 & 237.
Lepidium monoplocoides	Winged Peppercress	E	**Recorded**. One population of this species was found within the Indicative disturbance footprint during targeted surveys within the Murrumbidgee IBRA sub-region. Extensive suitable habitat within the Indicative disturbance footprint and known populations within the locality. Habitat occurs in the Indicative disturbance footprint in the form of PCTs 13, 15, 24, 26, 45, 46, 47, 159, 160, 163, 170, 216 & 237.
Maireana cheelii	Chariot Wheels	V	**Recorded.** Extensive suitable habitat within the Indicative disturbance footprint and known populations within the Indicative disturbance footprint and locality. Habitat occurs in the Indicative disturbance footprint in the form of PCTs 15, 23, 24, 26, 44, 46, 58, 157, 163 & 164.
Sclerolaena napiformis	Turnip Copperburr	E	**Moderate.** Habitat for the species is present within the Indicative disturbance footprint. Habitat occurs in the Indicative disturbance footprint in the form of PCTs 26, 44 & 46.
Swainsona murrayana	Slender Darling Pea	V	**Recorded.** Extensive populations of the species recorded throughout the Indicative disturbance footprint. Additional potential habitat occurs in the Indicative disturbance footprint in the form of PCTs 15, 17, 23, 24, 26, 28, 44, 46, 157, 163, 164 & 216.
Swainsona plagiotropis	Red Darling-pea, Red Swainson-pea	V	**Moderate.** Habitat for the species is present within the Indicative disturbance footprint. Habitat occurs in the Indicative disturbance footprint in the form of PCTs 26, 44, 45 & 46.
Swainsona recta	Small Purple-pea	E	**Moderate.** Habitat for the species is present within the Indicative disturbance footprint. Habitat occurs in the Indicative disturbance footprint in the form of PCTs 266 & 277.

(1) Indicates a species is listed V= Vulnerable, E = Endangered under the *Environmental Protection and Biodiversity Conservation Act 1999*.

Three additional EPBC listed threatened flora species have been assessed as assumed present in the Revised BDAR but determined to have a low likelihood of occurrence, being:

- *Pterostylis despectans* (Lowly Greenhood) – Endangered
- *Calotis moorei* (Burr-daisy) – Endangered
- *Solanum karsense* (Menindee Nightshade) – Endangered

These species have all been assessed as having less than two hectares of impact and have not been assessed as part of this Appendix. Further details on impacts to these species are provided in section 9.1.5 and section 11.1.2 of the Revised BDAR.

4.3 Threatened fauna species

Likelihood of occurrence assessments identified 21 threatened fauna species listed under the EPBC Act to have moderate or higher likelihood of occurring within the Indicative disturbance footprint or surrounding locality (10 km buffer area) (Attachment A) (Table 4.22). Of these nine terrestrial fauna species were recorded within the Indicative disturbance footprint.

The PMST search and the SEARs also identified the Pink-tailed Worm-lizard (*Aprasia parapulchella*), Grey Snake (*Hemiaspis damelii*) and Grey-headed Flying-fox (*Pteropus poliocephalus*) as having the potential to occur within the Indicative disturbance footprint. A targeted expert habitat assessment was undertaken for the Pink-tailed Worm-lizard in accordance with Section 5.3 of the NSW Biodiversity Assessment Method, consistent with current NSW DCCEEW guidance for assessing this cryptic species. The assessment involved a review of available spatial data and species records, together with a site inspection to assess the presence of key habitat attributes. While the Indicative disturbance footprint occurs within the broader modelled distribution for the species and contains PCTs in which it may occur elsewhere, the assessment concluded that suitable habitat is not present. In particular, the site lacks the combination of surface rock cover, vegetation structure, intact native groundcover and vegetation condition required to support the species.

The Grey Snake is typically associated with ephemeral wetlands and floodplain environments on heavy clay soils, particularly along major inland river systems. While the Indicative disturbance footprint occurs within the broader regional distribution of the species, the targeted habitat assessment and Revised BDAR surveys confirmed that key habitat features required by the species are absent, including ephemeral wetland habitats, cracking clay soils associated with wetland margins, and suitable prey-rich wetland environments. No Grey Snake records were identified within or proximate to the Indicative disturbance footprint, and the habitat present does not align with the species' known ecological requirements. On this basis, the Grey Snake is considered unlikely to occur within the Indicative disturbance footprint and is not considered further in the assessment.

The Grey-headed Flying-fox was also considered; however, the EPBC Act guidance for the species primarily relates to impacts on flying-fox camps, including roosting and breeding sites. No camps are known to occur within the Indicative disturbance footprint, and the proposed action would not result in impacts to any known camps. While the species may forage across the landscape, foraging habitat is widespread in the region and is not considered critical or limiting to the persistence of the species or nearby camps.

Based on these considerations, the Pink-tailed Worm-lizard, Grey Snake and Grey-headed Flying-fox are unlikely to be impacted by the amended project and have not been considered further in this assessment.

Table 4.22 Threatened fauna likelihood of occurrence within the Indicative disturbance footprint

Scientific name	Common name	EPBC Act[1]	Likelihood of occurrence
Litoria raniformis	Southern Bell Frog	V	**Recorded.** Species recorded during field survey. Habitat associated with PCTs 7, 10, 11, 13, 17, 24 & 53.
Aphelocephala leucopsis	Southern Whiteface	V	**Recorded.** BioNet records have identified individuals of this species within the Indicative disturbance footprint. Habitat associated with PCTs 7, 10, 11, 13, 15, 17, 20, 23 & 24.
Botaurus poiciloptilus	Australasian Bittern	E	**Moderate.** Habitat within the Indicative disturbance footprint is considered suitable for this species, and it has been recorded within the locality. Habitat associated with PCTs 10, 11, 13, 17, 24 & 160.

Scientific name	Common name	EPBC Act[1]	Likelihood of occurrence
Calidris acuminata	Sharp-tailed Sandpiper	V, M	**Moderate.** This species has been recorded within a various habitat type and consistently throughout the locality when conditions are favourable. Although not associated with any present PCTs officially, habitats present may be considered suitable based on this species diverse habitat preferences.
Climacteris picumnus victoriae	Brown Treecreeper (south-eastern)	V	**Recorded.** Recorded within the Indicative disturbance footprint. BioNet records have identified individuals of this species within the Indicative disturbance footprint. Additionally, extensive suitable habitat for this species occurs within the Indicative disturbance footprint. Habitat associated with PCTs 237, 266, 277 & 343.
Crinia sloanei	Sloane's Froglet	E	**Moderate.** This species is associated with PCTs present within the Indicative disturbance footprint. Habitat associated with PCT 237.
Falco hypoleucos	Grey Falcon	V	**Recorded.** BioNet records have identified individuals of this species within the Indicative disturbance footprint. Habitat associated with PCTs 10, 11, 13, 15, 17, 20, 22, 23, 24, 26, 28, 44, 45, 46, 47, 58, 157, 159, 160, 163, 164, 166, 170, 216 & 237.
Gallinago hardwickii	Latham's Snipe	V, M	**Moderate.** Habitat associated with PCTs 7, 10, 11, 13, 15, 17, 20, 28, 44, 86, 160, 163, 164, 216 & 237.
Grantiella picta	Painted Honeyeater	V	**Recorded**. Recorded within the indicative disturbance footprint. BioNet records have identified individuals of this species within the Indicative disturbance footprint. Habitat associated with PCTs 7, 10, 11, 13, 15, 20, 23, 26, 28, 58, 86, 237, 266, 277, 319 & 343.
Hirundapus caudacutus	White-throated Needletail	V, M,	**Moderate.** BioNet records have identified individuals of this species within the Indicative disturbance footprint. Additionally, extensive suitable habitat for this species occurs within the Indicative disturbance footprint. Habitat associated with PCTs 7, 10, 11, 13, 15, 17, 24, 26, 44, 45, 46, 47, 157, 160, 216, 237, 266, 277, 319 & 343.
Lathamus discolor	Swift Parrot	CE	**Moderate.** The indicative disturbance footprint subject land contains habitat suitable for this species and is within the known distribution of this species. Habitat associated with PCTs 7, 10, 11, 13, 15, 24, 26, 86, 237, 266, 277, 319 & 343
Lophochroa leadbeateri	Pink Cockatoo	E	**Recorded.** Recorded adjacent to the Indicative disturbance footprint. BioNet records have identified individuals of this species within the Indicative disturbance footprint. Additionally, extensive suitable habitat for this species occurs within the Indicative disturbance footprint. Habitat associated with PCTs 7, 10, 11, 13, 15, 20, 23, 26, 28, 45, 58, 159, 163, 170 & 237.

Scientific name	Common name	EPBC Act[1]	Likelihood of occurrence
Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)	E	**Moderate**. The Indicative disturbance footprint contains habitat suitable for this species and is within the known distribution of this species. Habitat associated with PCTs 7, 10, 11, 13, 15, 20, 23, 26, 28, 58, 86, 170 237, 266, 277, 319 & 343.
Neophema chrysostoma	Blue-winged Parrot	V	**Recorded.** BioNet records have identified individuals of this species within the Indicative disturbance footprint. Additionally, extensive suitable habitat for this species occurs within the Indicative disturbance footprint. Habitat associated with PCTs 7, 11, 13, 15, 17, 24, 26, 28, 44, 45, 46, 58, 157, 159, 160, 163, 164, 170 &, 216.
Pedionomus torquatus	Plains-wanderer	CE	**Recorded.** Recorded within Indicative disturbance footprint. BioNet records have identified individuals of this species within the Indicative disturbance footprint. Additionally, extensive suitable habitat for this species occurs within the Indicative disturbance footprint. Habitat associated with PCTs 44 and & 46.
Polytelis swainsonii	Superb Parrot	V	**Recorded.** Recorded within Inland Slopes. BioNet records have identified individuals of this species within the Indicative disturbance footprint. Additionally, extensive suitable habitat for this species occurs within the Indicative disturbance footprint. Habitat associated with PCTs 7, 10, 11, 13, 26, 237, 266, 277 & 343.
Rostratula australis	Australian Painted Snipe	E	**Moderate.** This species has been recorded throughout the locality when conditions are favourable. Habitat associated with PCTs 7, 10, 11, 13, 17, 24, 47, 53 & 160.
Stagonopleura guttata	Diamond Firetail	V	**High.** BioNet records have identified individuals of this species within the Indicative disturbance footprint. Habitat associated with PCTs 7, 10, 11, 13, 20, 23, 26, 28, 44, 45, 46, 58, 86, 170, 237, 266, 277, 319 & 343.
Tringa nebularia	Common Greenshank	E, M	**Moderate.** This species has been recorded throughout the locality when conditions are favourable. Although not associated with any present PCTs officially, habitats present may be considered suitable based on this species diverse habitat preferences.
Nyctophilus corbeni	Corben's Long-eared Bat	V	**Moderate.** This species is associated with numerous PCTs of the Murray Fans IBRA subregion found within the Indicative disturbance footprint. As this species occurs in varied habitat types, the Indicative disturbance footprint is considered suitable. Habitat associated with PCTs 10, 28, 86 & 266.
Phascolarctos cinereus	Koala	E	**Moderate.** Habitat associated with PCTs 7, 10, 11, 13, 15, 17, 20, 23, 24, 26, 28, 53, 58, 86, 157, 159, 160, 170, 216 237, 266, 277, 319, 343 &, 346.

(1) Indicates a species is listed V = Vulnerable, E = Endangered, CR = Critically Endangered, M = Migratory under the *EPBC Act*. The controlling provision for the EPBC referral is listed threatened species and ecological communities. Therefore, where a listed threatened species is also identified as migratory it has only been considered under the threatened species status i.e., Endangered.

4.4 Threatened aquatic species

Database searches, including PMST, NSW BioNet and the Fisheries Spatial Data Portal (Department of Primary Industries, 2026) identified eight threatened fish and one threatened crustacean listed under the EPBC to potentially occur within the amended project footprint. One species (Flathead Galaxias) is listed as critically endangered, five species (Silver Perch, Murray Hardyhead, Trout Cod, Southern Purple Spotted Gudgeon and Macquarie Perch) are listed as endangered, and three species (Murray Cod, Murray Spiny Crayfish and Southern Pygmy Perch) are listed as vulnerable under the EPBC Act. Of these, six species were identified as having a moderate or higher likelihood of occurrence (Attachment A) within the Indicative disturbance footprint (Table 4.23).

Table 4.23 Threatened aquatic species likelihood of occurrence within the Indicative disturbance footprint

Scientific name	Common name	EPBC Act[1]	Likelihood of occurrence
Bidyanus bidyanus	Silver Perch	E	**High** Previously recorded near the amended project footprint (ALA, 2025).
Craterocephalus fluviatilis	Murray Hardyhead	E	**Moderate** The amended project footprint intersects with key fish habitat for this species; however, the known populations of this species do not occur in NSW.
Euastacus armatus	Murray Spiny Crayfish	V	**Moderate** The amended project footprint intersects with key fish habitat for this species.
Galaxias rostratus	Flathead Galaxias	CE	**Moderate** The amended project footprint with key fish habitat for this species, however, there have been no records since 1995.
Maccullochella macquariensis	Trout Cod	E	**Moderate** Potential for stocked fish to inhabit the larger watercourses within the amended project footprint.
Maccullochella peelii	Murray Cod	V	**High** Previously recorded near the amended project footprint (ALA, 2025).

(1) Indicates a species is listed V = Vulnerable, E = Endangered, CR = Critically Endangered

The six EPBC-listed aquatic fauna species identified to have a moderate or higher likelihood of occurrence have been considered separately within the Appendix M-Aquatic Ecology Assessment, which addresses aquatic habitats and impact pathways. Accordingly, these species are not discussed further in this MNES appendix.

5 Potential impacts

The amended project would impact on the biodiversity within the Indicative disturbance footprint during the construction and ongoing maintenance once the VNI is operational. Direct impacts on listed threatened species and ecological communities associated with the amended project would occur from vegetation clearing and the associated loss or modification of habitat.

Indirect impacts occur when project-related activities affect vegetation or habitats in a manner other than a direct loss or clearing. By potentially modifying or disrupting ecological processes, these impacts can adversely affect the ecological values within the Indicative disturbance footprint.

To assess the direct impacts associated with construction of the amended project, indicative disturbance footprint have been defined. These areas represent the footprint within which vegetation would be impacted during construction, based on the amended project reference design, and have been developed having regard to avoidance and impact minimisation in accordance with the Revised BDAR.

5.1 Indicative disturbance footprint

An indicative disturbance footprint have been defined to establish the spatial extent of potential impacts associated with construction and operation of the amended project. The indicative disturbance footprint identify locations where vegetation may be removed or modified and provide the spatial framework for the assessment of both direct and indirect impacts to biodiversity values.

The indicative disturbance footprint for the two projects include NSW/Victorian border to future Dinawan substation component and existing Wagga 330 kV substation to future Gugaa 500 kV substation component (network augmentation works). The indicative disturbance footprint is based on amended project components from the reference design. The final disturbance areas would be confirmed during finalisation of design and construction methodology and would be developed as part of the consideration of avoidance and impact minimisation in accordance with the Revised BDAR and BAM.

The indicative disturbance footprint includes the following categories:

- Disturbance area A – Vegetation clearance is assumed for all areas where complete removal of vegetation is proposed, and the approach is outlined further below.
- Disturbance area B (B4 and B10) – Areas assumed to have minimal ground disturbance except in circumstances associated with the operational requirements for vegetation maintenance. This includes clearance of vegetation with a growth height potential of 4–10 metres within Disturbance area B4, and a clearance of vegetation with a growth height potential of greater than 10 metres within Disturbance area B10, subject to operational safety and maintenance requirements.
- Disturbance area HZ – A hazard tree zone where impacts to selected trees within the risk category height range 20–30 metre that exhibit poor structural stability and pose a risk of falling within required safety clearances.

As part of the indicative disturbance model development process, spatial data has been reviewed to reduce clearing overlaps, gaps or zones that are too small and impractical for large plant equipment to access areas. These areas have been conservatively included as part of the impacted areas for the purposes of this EPBC Act assessment.

The indicative disturbance footprint for each component reflects the width of the easement as described in section 1.2.1 of the Revised BDAR. Figure 1.4 of the Revised BDAR shows the indicative disturbance footprint for the amended project during construction and Figure 1.5 to Figure 1.8 of the Revised BDAR show the vegetation management approach during operation.

5.2 Direct impacts

The extent of direct impacts associated with the amended project has been refined through application of avoidance and impact minimisation principles during corridor selection and development of the reference design. Notwithstanding this refinement, construction would result in direct impacts to native vegetation and fauna habitat within the Indicative disturbance footprint, including habitat for EPBC Act-listed threatened species and ecological communities that have been recorded or assessed as having the potential to occur.

Direct impacts would primarily arise from vegetation clearing and modification within the indicative disturbance footprint, resulting in removal or alteration of habitat and associated biodiversity values. This would lead to a localised reduction in vegetation extent, structure and condition and a corresponding reduction in habitat availability for native fauna.

Removal of vegetation and habitat features would result in displacement of fauna into adjacent retained habitats, creating a temporary increase in competition for shelter, foraging and breeding resources until home ranges are re-established and populations re-equilibrate. Given the linear nature of the amended project, these effects are expected to be spatially dispersed but may be locally pronounced where higher-quality habitat is removed.

Direct impacts would also include the loss of important habitat features and microhabitats, which may comprise:

- ground-layer habitat (e.g. leaf litter, coarse woody debris, logs and dense native groundcover) that provides shelter and foraging resources for reptiles, amphibians and small mammals
- hollow-bearing trees and standing dead timber that provide roosting and breeding habitat for hollow-dependent fauna (including arboreal mammals, birds and microbats)
- flowering trees and shrubs that provide foraging resources for birds and flying-foxes.

Construction activities also present an inherent risk of direct injury or mortality to fauna, particularly during vegetation clearing, earthworks and vehicle/machinery movements. Increased vehicle movements along access tracks during construction may elevate the risk of fauna–vehicle interactions at a local scale. The presence of new transmission line infrastructure introduces an ongoing risk of fauna collision, particularly for bird species that regularly move through the landscape at heights intersecting the conductor envelope. Assessment of these risks, and the quantified extent of impacts to relevant MNES, is provided in Chapter 9 of the Revised BDAR.

5.2.1 Threatened ecological communities

The amended project would require clearing of 1,265.40 hectares of vegetation which may result in temporary and permanent residual impacts including threatened ecological communities. A summary of extent of clearing for threatened ecological are presented in Table 5.1. In addition, the amended project has the potential to create favourable conditions for invasive plant species (weeds) to invade and/or spread within areas immediately adjacent to ground disturbance. This can lead to an increase of existing invasive plant (weed) populations further degrading the ecological communities. These impacts have been considered as part of the significant impact assessment (Attachment B). Further information on the impacts is provided in Chapter 9 of the Revised BDAR.

Table 5.1 Summary of amended project impacts on EPBC Act listed TECs

TEC name	EPBC Act status[1]	Associated PCT and vegetation zones within the Indicative disturbance footprint	Disturbance area A (ha)	Disturbance area B4 (ha)	Disturbance area B10 (ha)	Disturbance area HZ (ha)	Total impact within Indicative disturbance footprint (ha)
Buloke woodlands of the Riverina and Murray Darling Depression bioregions	E	20_Thinned (0.24 ha) 20_Derived_No Offset (1.79 ha)	1.79	0.13	0.08	0.00	2.03
Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	E	237_Mod-good (0.59 ha)	0.13	0.26	0.07	0.13	0.59
Natural Grasslands of the Murray Valley Plains	CE	44_SVTM (0.20 ha) 44_Mo-good (15.16 ha) 45_Mod-good (3.50 ha) 46_Mod-good (48.13 ha) 46_SVTM (14.06 ha)	81.05	0.00	0.00	0.00	81.05
Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains	CE	47_Mod-good (0.19)	0.19	0.00	0.00	0.00	0.19
Weeping Myall Woodlands	E	26_Mod-good (77.77 ha)	42.99	34.78	0.00	0.00	77.77
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	CE	266_Mod-good (0.09 ha) 277_Mod-good (0.34 ha) 277_Thinned (2.28 ha)	1.64	0.49	0.57	0.00	2.69
Totals			**127.83**	**35.66**	**0.72**	**0.13**	**164.34**

(1) E = Endangered, CE = Critically Endangered under the EPBC Act

5.2.2 Threatened species

The amended project would directly impact habitat for threatened species listed under the EPBC Act, that have either been recorded or assessed as having a moderate to high likelihood of occurrence within the Indicative disturbance footprint. This would impact and reduce the overall in-situ and biodiversity (flora and fauna species abundance) within the Indicative disturbance footprint and wider locality. Even though, the extent of impacts has been refined based on design principles of avoid and minimise impacts, the anticipated impacts would happen, nonetheless.

The removal of habitat would displace native fauna into adjacent retained habitats and create a level of intraspecific and interspecific competition for habitat resources for a period, until home ranges are re-established, and a biodiversity equilibrium is once again attained.

Important microhabitat features that would be removed during land clearing, include:

- groundcover containing hollow logs, coarse woody debris, dense vegetation, and leaf litter suitable for sheltering by reptiles, amphibians and small mammals
- hollow bearing trees and stags providing sheltering and breeding habitat for a range of arboreal fauna such as gliders, possums, hollow nesting parrots, owlet nightjars, microbats, and native bees
- flowering eucalypts and other native trees providing suitable foraging habitat for fauna such as flying foxes and native birds.

A summary of impacts associated with habitat loss are presented in Table 5.2 and Table 5.3.

Table 5.2 Summary of amended project impacts on listed threatened flora species

Scientific name	Common name	EPBC Act status[1]	Total impact habitat (ha) or individuals[2]
Amphibromus fluitans	River Swamp Wallaby-grass	V	0.72
Austrostipa metatoris	–	V	1.07
Austrostipa wakoolica	–	E	65.03
Brachyscome muelleroides	Mueller Daisy	V	0.70
Brachyscome papillosa	Mossgiel Daisy	V	146.2
Eleocharis obicis	Spike Rush	V	176.16
Lepidium monoplocoides	Winged Peppercress	E	86.01
Maireana cheelii	Chariot Wheels	V	169.49
Sclerolaena napiformis	Turnip Copperburr	E	43.95
Swainsona murrayana	Slender Darling-pea	V	322.47
Swainsona plagiotropis	Red Darling-pea, Red Swainson-pea	V	46.12
Swainsona recta	Small Purple-pea	E	0.62

(1) V = Vulnerable, E = Endangered,

(2) Impact areas sourced from Section 9.1.5 in the Revised BDAR

Table 5.3 Summary of amended project impacts on listed threatened fauna species

Scientific name	Common name	EPBC Act status[1]	Total impact habitat (ha) or individuals
Aphelocephala leucopsis	Southern Whiteface	V	1251.47[2]
Botaurus poiciloptilus	Australasian Bittern	E	249.40[2]
Calidris acuminata	Sharp-tailed Sandpiper	V	0.19[3]
Climacteris picumnus victoriae	Brown Treecreeper (south-eastern)	V	3.33[2]
Crinia sloanei	Sloane's Froglet	E	0.59[4]
Falco hypoleucos	Grey Falcon	V	1230.47[2]
Gallinago hardwickii	Latham's Snipe	V	277.20[2]
Grantiella picta	Painted Honeyeater	V	382.52[2]
Hirundapus caudacutus	White-throated Needletail	V	819.70[2]
Lathamus discolor	Swift Parrot	CE	373.93[2]
Litoria raniformis	Southern Bell Frog	V	34.63[4]
Lophochroa leadbeateri	Pink Cockatoo	E	43.72[4]
Melanodryas cucullata cucullata	South-eastern Hooded Robin	E	659.92[2]
Neophema chrysostoma	Blue-winged Parrot	V	1185.99[2]
Nyctophilus corbeni	Corben's Long-eared Bat	V	38.59[2]
Pedionomus torquatus	Plains Wanderer	CE	78.50[5]
Phascolarctos cinereus	Koala	E	138.41[4]
Polytelis swainsonii	Superb Parrot	V	1.08[4]
Rostratula australis	Australian Painted Snipe	E	254.72[2]
Stagonopleura guttata	Diamond Firetail	V	648.17[2]
Tringa nebularia	Common Greenshank	E	0.19[3]

(1) V = Vulnerable, E = Endangered, CE = Critically Endangered under the EPBC Act.

(2) Ecosystem/dual credit species or other Commonwealth listed species. Impact (ha) calculation has been based on the associated PCTs polygon and therefore may represent an overestimate of the impacts associated the amended project. Where the species is known to only inhabit woodland vegetation, associated habitat has been limited to treed vegetation types (i.e. derived condition classes have been removed from assessment).

(3) These species are not associated within any PCTs. They are known to use wetland habitats including riparian areas but may also use the grassland habitat. For the purpose of this assessment the credits are based on PCT 47 Swamp grassland wetland of the Riverine Plain.

(4) Species credit species or dual credit species being where impacts to the species are being assessed as part of the species credit listing. Impact areas sourced from Section 9.1.5 in the Revised BDAR.

(5) Dual credit species given special provisions where impacts have been assessed for both species credit species and ecosystem credit impacts.

5.3 Indirect impacts

Indirect impacts occur when project-related activities affect vegetation or habitats in a manner other than direct loss or clearing. These impacts may arise through modification of ecological processes, disturbance to adjacent retained habitat, or changes to environmental conditions within and surrounding the construction footprint.

Indirect impacts associated with the amended project may include, but are not limited to, disturbance to adjacent vegetation and habitat, edge effects resulting in reduced habitat quality, increased noise, dust and light spill during construction, the introduction or spread of weeds, pests and pathogens, and an increased risk of fauna injury or mortality associated with construction activities and new infrastructure.

A summary of potential indirect impact pathways relevant to MNES is provided in Table 5.4. Indirect impacts on native vegetation, threatened species and their habitats have been assessed in the Revised BDAR, including consideration of the nature, extent and duration of these impacts (refer Table 9.19 of the Revised BDAR). These impacts have also been considered as part of the Significant Impact Assessment for MNES (Attachment B).

A summary of the indirect impacts associated with the amended project is provide in Table 5.4, further details on the indirect impacts are discussed in section 9.2 of the Revised BDAR.

Table 5.4 Summary of indirect impacts associated with the amended project

Indirect impact	Impacted entities	Location/extent	Frequency	Duration	Project phase	Consequence	Evidence-based justification for predictions of impacts (including limitations, assumptions and predictions)
Inadvertent impacts on adjacent retained habitat or vegetation	Habitat for listed threatened species; Listed threatened ecological communities; Aquatic habitat supporting listed threatened species	Adjacent retained vegetation and aquatic habitats, including creeks and rivers	Frequent during construction where works occur near sensitive features	Short-term	Construction	Low	Indirect impacts may occur through soil disturbance, erosion, sedimentation and runoff associated with construction activities. Predictions are based on the nature of construction activities and proximity to sensitive receptors. It is assumed that standard erosion and sediment control measures will be implemented. While sediment-laden runoff or accidental spills may temporarily affect water quality and habitat condition near waterways, impacts are expected to be localised, short-term and reversible. No long-term reduction in habitat availability or viability for listed threatened species or ecological communities is predicted.
Spread or introduction of weeds, pests and pathogens	Habitat for listed threatened species and ecological communities	Disturbance areas and adjacent retained vegetation	Occasional	Short- to long-term	Construction/ Operation	Low	Ground disturbance and vehicle movements may facilitate the spread of weeds, pests or pathogens into adjacent habitats. This prediction is based on known pathways of spread associated with construction activities. It is assumed that standard biosecurity, hygiene and rehabilitation measures will be implemented. With these assumptions, any spread is expected to be localised and unlikely to result in a measurable decline in habitat quality for listed threatened species or ecological communities.
Altered fire regimes or increased fire risk	Listed threatened species and ecological communities sensitive to altered fire regimes	Amended Project footprint and adjacent retained vegetation	Unlikely	Long-term (if realised)	Construction/ Operation	Low	Construction and operation activities may introduce ignition sources that could marginally increase fire risk. Altered fire regimes are recognised as a key threatening process under the EPBC Act. Predictions assume implementation of standard fire prevention and emergency response measures. With these measures in place, any change to fire regimes affecting listed threatened species or ecological communities is expected to be unlikely.
Loss or degradation of breeding habitat	Habitat supporting breeding, foraging or shelter requirements of listed threatened species	Within and adjacent to disturbance areas	Occasional	Short- to medium-term	Construction	Low	Indirect impacts such as noise, disturbance or temporary changes to microhabitat conditions may reduce the suitability of adjacent habitat for breeding or shelter. Predictions are based on the scale and duration of construction activities and the availability of surrounding habitat. Impacts are expected to be temporary and spatially limited, and not to result in a sustained reduction in breeding habitat availability for any listed threatened species.
Disease introduction	Listed threatened species susceptible to disease	Disturbance areas and adjacent habitats	Rare	Short- to long-term	Construction/ Operation	Low	Project activities may present a low risk of introducing or spreading disease agents through soil movement, water or fauna interaction. No specific diseases of concern have been identified for listed threatened species in the amended project area. Predictions assume implementation of standard hygiene and management controls. Disease introduction is therefore considered unlikely to result in a measurable impact.
Impacts to caves or microhabitat features	Listed threatened species reliant on caves, hollows or microhabitat features for roosting, shelter or breeding	Localised areas where such features occur	Rare	Short- to long-term	Construction	Low	Indirect impacts to microhabitat features may occur through vibration, dust or altered access during construction. Predictions are based on the limited extent of works and the localised distribution of such features. It is assumed that avoidance and mitigation measures will be applied where features supporting listed threatened species are identified. Any impacts are expected to be highly localised and unlikely to affect habitat availability at a population scale.
Increased risk of collision with transmission lines and associated infrastructure	Listed threatened bird species, particularly those that are larger-bodied, higher-flying or wide-ranging	Along sections of new linear infrastructure	Occasional	Short- to long-term	Construction/ Operation	Low	Collision risk predictions are based on known interactions between birds and linear infrastructure, species flight characteristics and the linear nature of the amended project. It is assumed that design and mitigation measures will be implemented. Given the scale of the amended project and availability of surrounding habitat, any collision risk is expected to be low and unlikely to result in a significant impact.
Potential electromagnetic field (EMF) effects	Listed threatened species potentially sensitive to EMF exposure	Immediate vicinity of electrical infrastructure	Rare	Long-term	Operation	Low	Scientific evidence linking EMF exposure from transmission infrastructure to adverse impacts on wildlife remains limited and inconclusive. Predictions assume EMF exposure would be localised and low intensity. Given the lack of demonstrated population-level effects, EMF impacts are considered unlikely to result in a measurable impact on listed threatened species.

6 Avoidance and mitigation measures

6.1 Avoidance

Avoidance of impacts to MNES has been a primary consideration throughout project planning and design, consistent with the mitigation hierarchy under the EPBC Act. Avoidance measures were incorporated early in project development, prior to detailed impact assessment, and have informed the adopted project design assessed in this appendix.

6.1.1 Overarching avoidance embedded in project design

Project planning and design were informed by desktop constraints mapping, field investigations and iterative design development, as documented in the Revised BDAR. This process guided corridor selection, infrastructure siting and construction methodology with the objective of avoiding and minimising impacts to biodiversity values, including MNES (Revised BDAR sections 8.1–8.5).

Design-led avoidance outcomes achieved through this process include:

- refinement of the amended project footprint and alignment to avoid areas supporting higher-quality native vegetation and mapped biodiversity constraints
- consolidation of disturbance footprints to reduce habitat fragmentation and edge effects
- preferential siting of infrastructure within previously disturbed or modified areas where available; and
- avoidance of sensitive landscape features, including riparian corridors and wetlands, where these contribute to MNES values.

Alternative locations, alignments, modes and design options were considered during project development and are documented in the Revised BDAR (section 8.1.2 and 8.1.3 of the Revised BDAR). These alternatives were evaluated having regard to environmental, engineering, land-use and safety constraints. Further alternatives beyond those documented in the Revised BDAR were not considered feasible or reasonable, as they would not materially improve avoidance outcomes for MNES or would introduce additional impacts or constraints.

The adopted project design therefore represents the outcome of an avoidance-led design and alternatives assessment process.

6.1.2 Targeted avoidance measures for MNES

In addition to overarching design-led avoidance, targeted avoidance measures have been applied to address potential impacts to MNES identified within the study area. These measures are informed by the threatened species and ecological community assessments presented in the Revised BDAR (Chapters 4–7 and section 8.1 of the Revised BDAR).

Targeted avoidance measures for MNES include:

- micrositing and refinement of infrastructure layouts during detailed design to avoid mapped threatened ecological communities and habitat for EPBC Act–listed threatened fauna where practicable
- retention of key habitat features that contribute to MNES values, including riparian vegetation, wetlands and habitat features such as hollow-bearing trees, where feasible within the design constraints
- incorporation of MNES spatial data into sensitive area mapping to inform detailed design and construction planning; and
- establishment of clearly defined exclusion and no-go areas around retained MNES habitat to prevent inadvertent disturbance during construction.

These targeted avoidance measures are embedded within the adopted project design and construction planning framework assessed in the Revised BDAR and underpin the assessment of residual impacts to MNES presented in this appendix.

6.2 Mitigation measures

A summary of the proposed mitigation measures is provided in Table 6.1 below. Further details on the mitigation measures can be found in section 9.4 of the Revised BDAR. In addition, Chapter 8 of the Revised BDAR sets out the avoidance measures undertaken to minimise impacts on listed species and ecological communities during the amended projects design. To illustrate the changes to mitigation measures between the EIS and the amended project, text that has been removed is shown in strike through and new text is shown in bold text. For the purposes of the mitigation measures, reference to 'project footprint' has the same meaning as 'amended project footprint'.

Table 6.1 Summary of proposed mitigation and management measures for residual impacts (direct and indirect)

Revised BDAR Mitigation Measure number	Mitigation measure	Method/technique	Timing	Frequency	Responsibility	Likely efficacy (including risk of failure)	Applicable locations	MNES (when relevant)
B01	**Mapping and assessment of threatened ecological communities, threatened species habitat and vegetation integrity to guide avoidance during detailed design and construction.**	**The Proponent will identify and map threatened ecological communities, threatened species habitat and SAII entities to inform further avoidance and micro siting. This will include: micro siting infrastructure and temporary works outside these locations and prioritising disturbance in lower condition vegetation where practicable (VI <17, and <15 for PCTs representative of EEC/CEECs); avoiding high biodiversity constraints (retained threatened species locations, TECs, SAII and MNES) to the greatest extent practicable; and incorporating the constraints mapping and avoidance framework into the BMP (and GIS/map based site specific sensitive areas and associated protocols) for construction implementation.**	**Detailed design (prior to finalisation); construction (implementation through BMP/SAPs).**	**During design and construction**	**Proponent; Construction contractor.**	**Efficacy: Moderate.** **Risk of failure: High (depending on design constraints and constructability).**	**All locations**	**All MNES impacted by the project**
B02	Assess changes to biodiversity impacts due to design refinements, construction methods or field surveys as required.	If refinements to the project design and construction methodology or additional field surveys result in increased impacts to biodiversity which are not included in this BDAR, these will be assessed in accordance with the requirements of the Biodiversity Assessment Method by an accredited assessor. For refinements to the project design and construction methodology considered to be “minor design refinement” (defined as less than <0.5 ha in area and immediately adjoining biodiversity study area), the assessment by an accredited assessor may consider the representative survey and assessment within the BDAR to inform the qualification of impact to biodiversity against the approved impacts and clearing limits within the BDAR. Impacts outside of the biodiversity study area not considered to be ‘minor design refinement’ will be subject to field survey and assessment in accordance with the requirements of the Biodiversity Assessment Method by an accredited assessor.	Detailed design and construction	Prior to finalisation of designs.	**Proponent; Construction contractor.**	Efficacy: Moderate. Risk of failure: Moderate. Design team must consider sensitive areas in final designs.	**All locations**	All MNES impacted by the project

Revised BDAR Mitigation Measure number	Mitigation measure	Method/technique	Timing	Frequency	Responsibility	Likely efficacy (including risk of failure)	Applicable locations	MNES (when relevant)
B03	Locate impacts in areas of existing disturbance/ low biodiversity value during finalisation of the design and construction methodology for the project.	Opportunities to locate facilities associated with construction compounds, laydowns and combined temporary worker accommodation facilities in areas of limited biodiversity value (e.g. cleared land or areas of native vegetation where offsets are not required) will be prioritised during finalisation of the design and construction methodology.	Detailed design	Prior to finalisation of designs.	**Proponent**	Efficacy: Moderate. Risk of failure: Moderate. Design team must consider sensitive areas in final designs.	**All locations**	All MNES impacted by the project
B04	**Vegetation protection measures.**	**No-go area demarcation (high-visibility temporary protection fencing (e.g. rope fencing) and signage) to be established prior to clearing in each construction area and maintained throughout construction. Tree protection measures will be further informed by the requirements of AS 4970-2009 Protection of Trees on Development Sites – Section 4 Tree Protection Measures. All areas containing threatened flora species assessed as retained or identified as special biodiversity protection zones are to be suitably delineated on site, included in relevant toolbox talks and/or other relevant site plans, and project GIS layers to ensure protection zones are maintained.**	**Construction (maintain for duration).**	**As part of pre-construction set up and retained for the duration of construction**	**Construction contractor.**	**Efficacy: High.** **Risk of failure: Low.**	**All retained vegetation and areas of significant biodiversity value**	**All MNES where relevant**
B05	Minimise access track construction and biodiversity impacts from access track remediation works	Existing access tracks and cleared areas will be used, where possible, to limit the construction of new access tracks. Where this is not possible, the design will seek to minimise impacts to native vegetation and riparian areas as a priority.	Detailed design and construction	As required, prior to set up of each construction area.	**Proponent; Construction contractor.**	Efficacy: Low. Risk of failure: High.	**All locations**	All MNES impacted by the project
B06	Locate and construct transmission line structures and temporary construction infrastructure to minimise impact to vegetated riparian corridors	Design and construction will minimise riparian vegetation clearing and disturbance of watercourses within the subject land. This will include micro-siting of transmission line structures and temporary construction infrastructure (including brake and winch sites, site offices, construction compounds, temporary worker accommodation facilities and access tracks), away from riparian areas, locating waterway crossings at narrow width locations where required and minimising the quantity of cut and fill activities.	Detailed design and construction	Prior to design finalisation and as required, prior to set up of each construction area.	**Proponent; construction contractor.**	Efficacy: Low. Risk of failure: High.	**All locations**	All MNES impacted by the project

Revised BDAR Mitigation Measure number	Mitigation measure	Method/technique	Timing	Frequency	Responsibility	Likely efficacy (including risk of failure)	Applicable locations	MNES (when relevant)
B07	Apply use of bird diversion techniques near sensitive habitats to minimise strike risk	Conductor line-marking techniques will be investigated during design refinement and implemented during construction to minimise bird strike. Positioning and exact diverter model will be finalised during design refinement and developed as part of a Connectivity Strategy and with reference to any preliminary findings of the current Transgrid sponsored Bird Strike study with Charles Sturt University. At minimum. these will be used within one kilometre of wetland/riverine habitats or recorded raptor nests to reduce impacts on aerial fauna species from collision and allow safer passage within these areas.	Detailed design, construction and operation	Must remain installed and be maintained throughout the construction phase and during operation	**Proponent; construction contractor.**	Efficacy: High. Risk of failure: Moderate, subject to implementation and ongoing monitoring/ adaptive management.	**All locations**	Australasian Bittern Curlew Sandpiper Pink Cockatoo Blue-winged Parrot Superb Parrot
B08	**Prepare and implement an unexpected and incidental finds protocol for threatened species.**	**An unexpected and incidental finds protocol will be included in the BMP and implemented if threatened ecological communities or species credit species were not assessed in, or were excluded from, the BDAR or are observed outside of BDAR assessed species polygons. The protocol will include stop-work triggers, assessment requirements to quantify extent of impact/occupation, notification to CPHR and adaptive responses including investigation and implementation of impact avoidance and minimisation if practicable. Unavoidable impacts to unexpected finds must be quantified, and consultation undertaken with DPHI and CPHR on whether additional mitigation measures or offsets will be required.**	**Developed during design** **Implemented during construction.**	**N/A**	**Construction contractor.**	**Efficacy: High.** **Risk of failure: Low.**	**Disturbance area.**	**All MNES impacted by the project**
B09	Establish connectivity corridors around key woodland habitats surrounding the transmission line corridor	A series of connectivity corridors up to 20 m wide will be established near transmission line structure locations that occur in woodland vegetation. These will occur at strategic locations which will be developed as part of a Connectivity Strategy, targeting the following locations (wherever practicable): — key riparian crossings — areas of the alignment joining state forest and or conservation reserve estate — areas of identified Squirrel Glider habitat (including under transmission line glider poles). These connectivity corridors will involve native vegetation retention up to 10 metres or 20 metres wide (for 330 kV and 500 kV lines, respectively). Vegetation heights to be retained will be determined in accordance with vegetation clearing requirements at each location.	**Developed during design** Implemented during construction.	**Prior to design finalisation**	**Proponent; construction contractor.**	Efficacy: High. Risk of failure: Low, subject to implementation	**All locations**	Southern Whiteface Brown Treecreeper South-eastern Hooded Robin Koala Pink-tailed Worm-Lizard Grey Snake Painted Honeyeater Diamond Firetail Growling Grass Frog / Southern Bell Frog

Revised BDAR Mitigation Measure number	Mitigation measure	Method/technique	Timing	Frequency	Responsibility	Likely efficacy (including risk of failure)	Applicable locations	MNES (when relevant)
B10	Provide compensatory habitat.	A Supplementary Hollow and Habitat Strategy will be prepared and implemented to provide alternative roosting and breeding habitat for fauna displaced by clearing. The Strategy will define supplementary hollow numbers and types based on hollows to be removed, threatened species likely to utilise removed habitat, landholder approved locations and installation timing, including installation timeframes. It will also address salvage and reuse of natural habitat materials (including bush rock), monitoring and maintenance requirements with audit-ready annual reporting and spatial data. A Trigger Action Response Plan (TARP) will be provided to address delays or underperformance against installation or effectiveness targets.	Detailed design; Pre-clearing - identification of requirements Construction and operation (monitoring/maintenance).	Strategy to be developed at pre-clearing stage and implemented during construction and operation	Construction contractor; Proponent.	Efficacy: Low–High (species-dependent). Risk of failure: Low–Moderate (depends on procurement, timing and maintenance).	Relevant locations.	All MNES species that are hollow dependent impacted by the project
B11	Prepare and implement a Fauna Management protocol (sub-plan to BMP).	The fauna management protocol will document pre-clearing fauna survey requirements and management measures. Surveys will be conducted by a suitably qualified ecologist prior to clearing. Surveys will confirm that protection measures are in place and include fauna searches, hollow inspections, relocation and identification of nesting fauna and habitat features that require further management during clearing. Specific management measures will be documented for each fauna group with reference to known threatened species and will include predator monitoring/control, rubbish controls, vehicle-strike controls, and monitoring of use of key habitat features such as caves/cliff lines within proximity of construction. Fauna relocation areas, compensatory habitat (e.g. nest boxes), and pre-confirmed veterinary support and contacts will be identified. A Fauna Handling Protocol will be developed and included in the plan and methods documented in clearing permits. A post-clearing report will be prepared for each segmented clearing areas, for inclusion as part of annual monitoring, documenting all fauna interactions, any mortality and outcomes during clearing and quantities and locations of salvaged hollows and logs, and bush rock reused for habitat supplementation.	Pre-clearing at each location; post clearing reporting following clearing activities.	Plan to be developed at pre-clearing and implemented during construction	Construction contractor	Efficacy: High. Risk of failure: Moderate.	All disturbance areas.	All MNES impacted by the project

Revised BDAR Mitigation Measure number	Mitigation measure	Method/technique	Timing	Frequency	Responsibility	Likely efficacy (including risk of failure)	Applicable locations	MNES (when relevant)
B12	Include a two-stage clearing process in the Fauna Management Protocol (sub-plan to BMP).	Where hollow bearing trees or key habitat features are identified, they will be clearly marked on site during pre-clearing surveys by an ecologist and spatially recorded. Prior to the commencement of any clearing, hollow inspections will be undertaken ~~using scope/camera technology~~ by a suitably qualified ecologist to identify active fauna use, assess hollow condition and occupancy, and inform appropriate fauna-sensitive clearing methods which may include avoiding clearing of confirmed breeding habitat during spring/or breeding season (as identified in the sub-plan): Non-habitat vegetation will be cleared first and habitat tree removal delayed for at least 24 hours after clearing of surrounding vegetation. Habitat trees will be felled using fauna appropriate methods based on hollow size and risk (sectional dismantling preferred for trees with hollows >5 cm), with immediate inspection of felled material, appropriate treatment or relocation of any fauna encountered, and documentation of methods used. Suitable hollows and logs and bush rock will be reused where practicable and clearing outcomes will be documented for each vegetation clearing stage, including spatial data and details on hollows cleared, their characteristics and occupancy. This information will be provided for regulatory review and auditing in annual monitoring reporting.	Pre-construction (During pre-clearing and clearing).	Ongoing throughout construction	Construction contractor.	Efficacy: Moderate–High. Risk of failure: Low–Moderate.	All disturbance areas identified during pre-clearing survey	All MNES species that are hollow dependent impacted by the project
~~B08~~	~~Provide effective compensatory habitat strategy for hollow dependent fauna.~~	~~A strategy for compensatory habitats will be provided that directly addresses the projects impacts to nesting habitat for threatened fauna displaced during construction. The strategy will include the following requirements:~~ ~~survey of tree hollows and nests within the proposed clearing extents and evaluation of hollow utilisation and resource availability.~~ ~~investigation into strategic and optimal placement of hollows for the targeted species within the locality/region~~ ~~investigating new and emerging monitoring~~ ~~funding of targeted research that contributes to effective compensatory habitat measures relevant to the project impacts; and~~ ~~measures to address and manage nests (such as raptor nests) prior to clearing.~~	~~Detailed design and Construction~~	~~Prior to the commencement of clearing works in each construction area.~~		~~Efficacy: Moderate.~~ ~~Risk of failure: Low, subject to the implementation of ongoing management.~~		~~Southern Whiteface~~ ~~Gang-Gang Cockatoo~~ ~~Brown Treecreeper (South-eastern)~~ ~~Pink Cockatoo~~ ~~Superb Parrot~~

Revised BDAR Mitigation Measure number	Mitigation measure	Method/technique	Timing	Frequency	Responsibility	Likely efficacy (including risk of failure)	Applicable locations	MNES (when relevant)
B09	Complete pre-clearing surveys by a suitability qualified ecologist prior to clearing at each location.	The proposed clearing extents will be marked out on site prior to the pre-clearing surveys. During the surveys, the ecologist will: survey the proposed clearing extent identify any fauna that will require relocation prior to clearing confirm the location and mark out the extents of any biodiversity exclusion zones confirm that hollow-bearing trees within and adjacent to the clearing extents are prominently marked/tagged; and confirm compensatory habitats for hollow dependant fauna species are in place (where required) in suitable locations adjacent to areas to be cleared, or suitable locations for installation have been identified survey and confirm the presence of raptor nests within and adjacent to the clearing extents.	Detailed design at relevant sites	Prior to the commencement of clearing works in each construction area.		Efficacy: High. Risk of failure: Moderate.		All MNES impacted by the project
B10	Accurately map sensitive areas in vicinity of disturbance footprint.	Where required, the results of the pre-clearing surveys will be used to update and verify sensitive area maps within the BDAR.	Detailed design	Prior to the commencement of clearing works		Efficacy: Moderate. Risk of failure: Moderate.		All MNES impacted by the project
B11	Map and confirm biodiversity exclusion zones for retained vegetation.	Biodiversity exclusion zones for retained vegetation will be confirmed by a suitably qualified ecologist and identified as 'No disturbance' zones prior to the commencement of clearing or any site activity that could damage the vegetation within the exclusion zone. 'No disturbance' zones will consider: identified Plains-wanderer habitat identified threatened flora populations threatened ecological communities connectivity corridors, and known habitat for threatened frogs and reptiles. Biodiversity exclusion zones will be physically marked and demarcated, and included on sensitive area maps, prior to clearing.	Detailed design	Prior to design finalisation		Efficacy: High. Risk of failure: Moderate.		All MNES impacted by the project

Revised BDAR Mitigation Measure number	Mitigation measure	Method/technique	Timing	Frequency	Responsibility	Likely efficacy (including risk of failure)	Applicable locations	MNES (when relevant)
~~B12~~	~~Map and confirm biodiversity sensitive areas in the partial clearing zones.~~	~~Biodiversity sensitive areas will be demarcated by a qualified ecologist for areas subject to partial clearing zones prior to the commencement of clearing.~~ ~~'Biodiversity sensitive areas' will consider:~~ ~~identified Plains-wanderer habitat~~ ~~identified threatened flora populations~~ ~~threatened ecological communities~~ ~~connectivity corridors~~ ~~known habitat for threatened fauna species.~~ ~~Biodiversity sensitive areas will be physically marked and demarcated, and included on sensitive area maps, prior to clearing.~~	~~Detailed design~~	~~Prior to design finalisation~~		~~Efficacy: High.~~ ~~Risk of failure: Moderate~~		~~All MNES impacted by the project~~
B13	**Prepare and implement a Partial Clearing Protocol (sub-plan to BMP).**	**The protocol will define clearing methods for Disturbance Areas B and HZ and non-disturbance areas for PCT's where partial clearing is proposed. The protocol will address identified hand-clearing-only areas; measures to retain groundcover and shrubs to specified heights; appropriate tree waste management for mulch, woodchip and logs to ensure partial clearing objectives are met, protection measures and mapping for retained threatened species/habitat; and incident reporting requirements. The protocol will also require documentation of clearing equipment used and post-clearing inspections to verify compliance with partial-clearing requirements and meet verification reporting requirements under B23. Tracked machinery will be avoided where possible in Disturbance Area B, and low-impact methods used to meet understorey retention objectives including retention of threatened plant species with growth forms of <2 m in height. Removal of root balls and root stock will be avoided except where required for civil/construction footprints, with root zones retained in situ wherever practicable and hand clearing used in mapped sensitive biodiversity areas.**	**Pre-construction (prepare); construction (implement).**	**Protocol to be developed during detailed design and implemented during construction**	**Construction contractor.**	**Efficacy: Moderate.** **Risk of failure: Moderate.**	**Disturbance Area B; Disturbance Area HZ; non-disturbance areas within footprint.**	**All MNES impacted by the project**

Revised BDAR Mitigation Measure number	Mitigation measure	Method/technique	Timing	Frequency	Responsibility	Likely efficacy (including risk of failure)	Applicable locations	MNES (when relevant)
B14	Implement Plains-wanderer specific workforce induction training	A Plains-wanderer specific protocol will be developed to ensure that all construction workers are aware of the sensitivities around this critically endangered species and to ensure that all specific requirements in relation to protection, avoidance, management and observation of individual Plains-wanderers are considered. This protocol will be implemented during all project activities in Plains-wanderer habitat.	Detailed design and construction	Inductions and training is to be completed once prior to commencing work. Toolbox talks will be undertaken daily or as required.	Construction contractor.	Efficacy: High. Risk of failure: Low.	All locations	Plains-wanderer
B15	Conduct ecology-focused inductions, toolbox talks and targeted training.	Induct and train all relevant personnel (including subcontractors) on biodiversity values, sensitive areas maps, special biodiversity exclusion zones, clearing boundaries and limits and key protocols (including consequences for breaches). Provide sensitive area maps and updates. Toolbox talks to occur daily or when commencing in a new area.	Prior to construction; ongoing toolbox talks).	Inductions and training are to be completed once prior to commencing work. Toolbox talks will be undertaken daily or as required.	Construction contractor.	Efficacy: High. Risk of failure: Moderate.	All locations.	All MNES impacted by the project
B16	Monitor clearing of native vegetation areas to ensure impacts areas are not greater than anticipated	The predicted clearing area of native vegetation by the project will be monitored against the recorded clearing area. A revised BAM-C calculation on the project's final project disturbance post construction will be completed and any changes to the credit liability identified will be reflected in the biodiversity offset requirements within the biodiversity offset package.	Construction	Monitoring will be ongoing throughout construction/ vegetation clearing.	Proponent; construction contractor.	Efficacy: Moderate. Risk of failure: Moderate. Requires ongoing monitoring	All locations	All MNES impacted by the project
~~B16~~	~~Monitor partial impacts to native vegetation to ensure impact are not greater than anticipated in BDAR~~	~~The partial clearing outcomes will be verified within 12 months of clearing occurring to confirm future vegetation integrity. If partial clearing impacts are shown to be greater than the BDAR predictions, adaptive management practices will be implemented within easement to achieve predicted vegetation integrity (VI).~~	~~Construction~~	~~Monitoring will be ongoing throughout construction/ vegetation clearing.~~		~~Efficacy: Moderate.~~ ~~Risk of failure: Moderate.~~ ~~Requires ongoing monitoring~~		~~All MNES impacted by the project~~
B17	Minimise residual impacts to riparian areas and aquatic environments	Activities within riparian zones (within the definition of the Controlled activities – Guidelines for riparian corridors on waterfront land (DCCEEW, 2025)) will be managed to minimise impacts to native riparian understorey vegetation and aquatic environments. Riparian areas subject to disturbance will be progressively stabilised and rehabilitated to minimise impacts to aquatic habitats, water quality from sedimentation and erosion. Where possible vegetation clearing will be limited to the tree stratum only, with trunk bases being retained in-situ.	Construction, Operation	Ongoing implementation throughout construction/ vegetation clearing. Rehabilitation of disturbed areas to occur post-construction	Construction contractor, Proponent	Efficacy: Moderate. Risk of failure: Moderate. Requires ongoing monitoring	All locations	All MNES impacted by the project

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~~B18~~	~~Implement threatened ecological communities and species unexpected finds protocol~~	~~A species unexpected finds protocol will be implemented if threatened ecological communities, threatened flora and fauna species, not identified as candidate species in the biodiversity assessment, are identified in the disturbance area.~~ ~~Where pre-clearing surveys identify additional areas of threatened ecological communities, threatened flora and fauna species to those assessed within the approved biodiversity assessment, existing mitigation controls, including Biodiversity exclusion zones will be implemented.~~	~~Construction~~	~~Ongoing implementation throughout construction~~		~~Efficacy: Moderate.~~ ~~Risk of failure: High.~~		~~All MNES impacted by the project~~
~~B19~~	~~Develop and implement Vegetation Clearing Procedure~~	~~A Vegetation Clearing Procedure will be developed and implemented as part of the biodiversity management sub-plan.~~ ~~Methods and techniques could include:~~ ~~pre-clearing survey methodology and reporting requirements~~ ~~consideration of density, species and maximum height~~ ~~two stage clearing protocol~~ ~~clearing methods for partial clearing areas to maintain target vegetation condition (integrity)~~ ~~methods for soft felling habitat trees.~~	~~Construction~~	~~Ongoing implementation throughout construction~~		~~Efficacy: Moderate.~~ ~~Risk of failure: High.~~		~~All MNES impacted by the project~~

Revised BDAR Mitigation Measure number	Mitigation measure	Method/technique	Timing	Frequency	Responsibility	Likely efficacy (including risk of failure)	Applicable locations	MNES (when relevant)
B18	Implement construction methodology approach for special biodiversity protection zones - Natural Grasslands of the Murray Valley Plains and Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains	Special biodiversity protection zone – Natural Grasslands of the Murray Valley Plains. A bespoke construction methodology will be prepared and implemented to minimise impacts as far as practical to the mapped Natural Grasslands of the Murray Valley Plains – Critically Endangered Threatened Ecological Community (as shown on Figure 15.9). This methodology will include at a minimum: — pre-clearing induction of all contractors that work in this area to discuss this special biodiversity protection zone — during clearing, an ecologist shall be on site at all times to monitor activities within this special biodiversity protection zone — access being prioritised using existing access tracks — clearing being restricted to the identified transmission line structures worksite locations and short new perpendicular access track or alternative track locations that further reduce impacts to the special biodiversity protection zone. Access tracks will provide access between the existing access track along the project alignment and the transmission line structures and worksite locations — alternative line installation techniques which do not require clearing of disturbance area A (centreline) (where practicable) The final clearing methodology will be developed in accordance with the commitment in mitigation measure B1.	Construction	Ongoing implementation throughout construction/ vegetation clearing in identified area.	Proponent; construction contractor.	Efficacy: Moderate. Risk of failure: High.	Special biodiversity protection zones	Natural Grasslands of the Murray Valley Plains and Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains

Revised BDAR Mitigation Measure number	Mitigation measure	Method/technique	Timing	Frequency	Responsibility	Likely efficacy (including risk of failure)	Applicable locations	MNES (when relevant)
B19	Implement construction methodology approach for special biodiversity protection zone SAII TECs -*White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions* and *Allocasuarina luehmanii Woodland in the Riverina and Murray-Darling Depression Bioregions*	A bespoke construction methodology for transmission line structures will be prepared and implemented to minimise impacts as far as practical to the mapped SAII TECS and EPBC TECs (as shown on Figure 15.9). This methodology will include at a minimum: — pre-clearing induction of all contractors that work in this area to discuss this special biodiversity protection zone — during clearing an ecologist shall be on site at all times to monitor activities within this special biodiversity protection zone — access being prioritised from existing tracks — clearing being restricted to the identified transmission line structures worksite locations and short new perpendicular access track or alternative track locations that further reduce impacts to the special biodiversity protection zone. Access tracks will provide access between the existing access tracks along the project alignment and the transmission line structures and worksite locations. The final clearing methodology will be developed in accordance with the commitment in mitigation measure B1.	Construction	Ongoing implementation throughout construction/ vegetation clearing in identified area.	**Proponent; construction contractor.**	Efficacy: Moderate. Risk of failure: High.	**Special biodiversity protection zones**	White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland and *Allocasuarina luehmanii Woodland in the Riverina and Murray-Darling Depression Bioregions*

Revised BDAR Mitigation Measure number	Mitigation measure	Method/technique	Timing	Frequency	Responsibility	Likely efficacy (including risk of failure)	Applicable locations	MNES (when relevant)
B20	Implement special biodiversity protection zone – Plains-wanderer	A bespoke construction methodology will be employed which will avoid and minimise impact as far as practicable to the species' habitat (as shown on Figure 15.19). This methodology will include at a minimum: — pre-clearing induction of all contractors that work in this area to discuss this special biodiversity protection zone — during clearing an ecologist shall be on site at all times to monitor activities within this special biodiversity protection zone — access being prioritised from existing tracks — clearing being restricted to the identified transmission line structures worksite locations and short new perpendicular access track or alternative track locations that further reduce impacts to the special biodiversity protection zone will be utilised — access tracks will link to existing access tracks along the project alignment and the transmission line structures and worksite locations — alternative line installation techniques e.g. aerial stringing which do not require clearing of disturbance area A (centreline) (where practicable). The final clearing methodology will be developed in accordance with the commitment in mitigation measure B1.	Construction	Ongoing throughout construction/vegetation clearing in identified area.	**Proponent; Construction contractor.**	Efficacy: Moderate. Risk of failure: High.	**Special biodiversity protection zones**	Plains-wanderer
B21	**Prepare and implement a Biodiversity Impact Monitoring Plan (BIMP) to monitor, verify and report on biodiversity impacts and mitigation effectiveness.**	**Include a BIMP as part of the BMP. The BIMP will include a structured monitoring program with annual reporting and an adaptive management component with quantitative triggers and corrective actions (TARP) The BIMP must consolidate the monitoring and adaptive management requirements for all BMP subplans identified in this table. Where partial-clearing outcomes require verification, the BIMP will specify verification monitoring and reporting requirements (in compliance with project approval conditions) and BMP sub-plan requirements.**	**Pre-construction (prepare); construction**	**Ongoing throughout project operation**	**Construction contractor**	**Efficacy: High.** **Risk of failure: Low–Moderate (depends on implementation and follow-through on corrective actions).**	**All locations.**	**All MNES impacted by the project**

Revised BDAR Mitigation Measure number	Mitigation measure	Method/technique	Timing	Frequency	Responsibility	Likely efficacy (including risk of failure)	Applicable locations	MNES (when relevant)
B22	Include features of high biodiversity conservation significance in Transgrid's GIS	Features of high biodiversity conservation significance within the operational easement, including special biodiversity protection zones identified during construction and retained habitat for threatened species, will be recorded in Transgrid's GIS. The GIS information will be reviewed during the planning of all maintenance or other future activities that could cause disturbance.	Prior to operation	Ongoing throughout project operation	Proponent; construction contractor,	Efficacy: High. Risk of failure: Moderate.	All locations	All MNES impacted by the project
B23	Update guidelines and procedures for operation and maintenance of the project	Project specific biodiversity controls will be embedded in Transgrid's existing Environmental Management System including: — vegetation clearing and maintenance commitments in the BDAR — continue to avoid disturbance in biodiversity exclusion zones identified during the construction — minimise access and disturbance in areas of high biodiversity conservation significance; and — avoiding maintenance of vegetation that does not need to be maintained during operation. Training will be provided to relevant Transgrid operational personnel and vegetation maintenance contractors regarding the operational and maintenance biodiversity guidelines and procedures.	Operation	Ongoing throughout project operation	Proponent; construction contractor.	Efficacy: High. Risk of failure: Moderate.	All locations	All MNES impacted by the project

Revised BDAR Mitigation Measure number	Mitigation measure	Method/technique	Timing	Frequency	Responsibility	Likely efficacy (including risk of failure)	Applicable locations	MNES (when relevant)
B24	Instream works for access	The following factors will be considered during the detailed design and micro siting process for waterway crossings to minimise potential impacts to aquatic environments, wherever practicable: — any existing crossings will be re-used or upgraded in preference to establishing new crossings — disturbance to waterways (bed, banks and associated riparian zones), will be avoided or minimised — the crossing design will minimise disturbance to any native vegetation, including native instream, fringing, and riparian vegetation within the access track alignment — watercourse crossings will be constructed perpendicular to the flow of the water and be positioned away from channel bends (where erosive forces are typically greatest). Preferably crossings will be located in straight stream sections with well-defined channel geometries and shallow stream gradients, in stable dry reaches — micro-siting will avoid direct and indirect (erosion or sedimentation) impacts to riverine features such as riffles and rapids and sensitive habitat features (i.e. snags, coarse woody debris, instream macrophytes) — all works within watercourse will be completed outside spawning periods of fish that inhabit the stream, which is typically spring through autumn — any dewatering required during works, will be carried out with consideration of native fauna at both the dewatered and downstream locations and appropriate measures will be implemented to relocate native aquatic fauna as required.	Detailed design and construction	Ongoing throughout amended project construction	Proponent; construction contractor.	Efficacy: High. Risk of failure: Moderate.	New or upgraded watercourse crossings (refer to Appendix M Aquatic Assessment Table 3.2)	All MNES impacted by the amended project

Revised BDAR Mitigation Measure number	Mitigation measure	Method/technique	Timing	Frequency	Responsibility	Likely efficacy (including risk of failure)	Applicable locations	MNES (when relevant)
B25	Instream works associated with watercourse crossings	Watercourse crossings will be designed, micro-sited and constructed in accordance with *Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings* (Fairfull & Witheridge 2003) and will include maintaining existing nominal flow velocity where possible or at less than 0.3 m/sec to avoid damage to aquatic habitats. **Watercourse crossings over key fish habitat identified in Table 3.2 and via field verification (refer to mitigation measure A3) will be designed in consultation with NSW DPIRD Fisheries.** Any temporary watercourse crossings will be removed and rehabilitated at the completion of their operational use.	Detailed design, construction	Ongoing throughout amended project construction	Proponent; Construction contractor	Efficacy: High. Risk of failure: Moderate.	**New or upgraded watercourse crossings (refer to Appendix M Aquatic Assessment Table 3.2)**	All MNES impacted by the amended project
B26	**Field verification of watercourse crossings**	**Watercourse crossing locations subject to desktop assessment only will be subject to field verification prior to construction. Field verification will include:** – **identifying the type and class of watercourse in accordance with Policy and guidelines for fish habitat conservation and management (Update 2013) (DPI, 2013)** – **determining the presence/absence or likelihood of threated aquatic species occurring** – **confirming the need for any additional mitigation measures e.g. timing of works, or site-specific micro-siting or design requirements.**	**Detailed design**	**Timing to occur once during detailed design but prior to construction**	**Proponent; Construction contractor**	**Efficacy: High.** **Risk of failure: Low.**	**New or upgraded watercourse crossings (refer to Appendix M Aquatic Assessment Table 3.2)**	**All MNES impacted by the amended project**
B27	Offsets for residual impacts to key fish habitat	During the detailed design and micro-siting process, potential impacts to key fish habitat will be minimised wherever practicable and where residual impacts are identified these will be quantified and offset in accordance with *Policy and guidelines for fish habitat conservation and management (Update 2013)* (DPI, 2013). **Should offsets be required, an Aquatic Ecological Offset Strategy will be developed and implemented in consultation with NSW DPIRD Fisheries.** In addition, opportunities for stockpiling and supply of felled trees for key fish habitat rehabilitation or improvement works will be investigated in consultation with NSW DPIRD Fisheries.	Detailed design, construction	Ongoing throughout amended project construction	**Proponent; construction contractor**	Efficacy: High. Risk of failure: Moderate.	Where key fish habitat is impacted	All MNES impacted by the amended project

Revised BDAR Mitigation Measure number	Mitigation measure	Method/technique	Timing	Frequency	Responsibility	Likely efficacy (including risk of failure)	Applicable locations	MNES (when relevant)
B28	Instream works and bank stabilisation for watercourse crossings	Any sections of stream or watercourse banks that are impacted or modified by the amended project will be reformed or remediated to resemble the pre-work or better condition and form wherever possible or alternatively to a stable design form, as appropriate following the completion of construction work. Felled trees from the project will be used as instream habitat in the form of large woody debris where practicable.	Construction	Ongoing throughout amended project construction	Construction contractor	Efficacy: High. Risk of failure: Moderate.	Watercourses impacted within the amended project footprint	All MNES impacted by the amended project
B29	Biosecurity risks at watercourse crossings	The following measures will be implemented to manage biosecurity risks associated with any instream work: — all vehicles, vessels and personal protective gear will be disinfected prior to entering a watercourse — equipment used during any instream works will be cleaned, drained, and dried before storing or moving it to a different body of water — all sands and sediments used as infill shall be clean and have not been previously used in another watercourse — any invasive aquatic species encountered during instream works and dewatering activities will be captured and humanely euthanised.	Construction	Ongoing throughout amended project construction	Construction contractor	Efficacy: High. Risk of failure: Moderate.	Watercourses within the amended project footprint	All MNES impacted by the amended project
B30	Management of large woody debris	Large woody debris in the vicinity of watercourse crossings will be managed in accordance with *Policy and guidelines for fish habitat conservation and management (Update 2013)* (DPI, 2013). Where impacts cannot be avoided, lopping will be considered as the first priority for the management of large woody debris. Where lopping is not practicable, realignment of large woody debris will be considered as the next possibility, followed by relocation.	Construction	Ongoing throughout amended project construction	Construction contractor	Efficacy: High. Risk of failure: Moderate.	Watercourses within the amended project footprint	All MNES impacted by the amended project
B31	**Management of discharged water**	**Any dewatering required during works, will be carried out with consideration of native aquatic fauna at both the dewatered and downstream locations and appropriate controls will be implemented to relocate native aquatic fauna, as required.** **Water discharges into watercourses, particularly containing spawning habitat during spawning periods (detailed in Table 5.4), would not be discharged directly into the watercourse if there is a temperature difference. Discharged water will be cooled or heated to match the ambient water temperature of the watercourse, as required.**	**Construction**	**Ongoing throughout amended project construction**	**Construction contractor**	**Efficacy: High.** **Risk of failure: Moderate**	**Watercourses within the amended project footprint that contains water and is connected to a watercourse containing key fish habitat.**	**All MNES impacted by the amended project**

Revised BDAR Mitigation Measure number	Mitigation measure	Method/technique	Timing	Frequency	Responsibility	Likely efficacy (including risk of failure)	Applicable locations	MNES (when relevant)
B32	Stringing of transmission lines	Stringing over watercourses deemed to contain key fish habitat will be undertaken in a manner to avoid and/or minimise impacts to aquatic habitat. This will include, but not be limited to the use of watercraft, netting or other controls to manage the risk of construction materials and equipment inadvertently falling within the watercourse, where reasonable and feasible.	Construction	Ongoing throughout amended project construction	Construction contractor	Efficacy: High. Risk of failure: Low	Watercourses within the amended project footprint that contains key fish habitat	All MNES impacted by the amended project

7 Threatened biodiversity assessment

Residual impacts are impacts of the amended project that may remain after the mitigation measures have been considered. The residual significant impact was determined by applying the relevant significant impact criteria set out in the *Significant Impact Guidelines (1.1 and 1.2)* relevant to listed threatened species and ecological communities and Commonwealth Land.

The following factors have been considered in assessing the residual impacts on the environment and listed threatened species and ecological communities:

- nature of the impacts such as direct, indirect, cumulative and facilitated
- magnitude of the impact, taking into account the severity and scale of the impact when compared with baseline condition timing, duration and frequency of the impact (temporary or permanent)
- likelihood that any given impact would occur
- whether any impacts are unknown, unpredictable or irreversible
- benchmarks and requirements set by statutory requirements, policies, and guidelines
- mitigation measures to minimise the impacts.

Details on the residual impacts to MNES are outlined in Chapters 9 and 11 of the Revised BDAR.

Under the EPBC Act where a project is likely to have a significant residual impact on a listed threatened species and/or community, the impacts must be compensated. Based on the assessment of significance the amended project would result in a significant residual impact to two threatened ecological community and 10 threatened species.

The Australian Government has endorsed the NSW Biodiversity Offsets Scheme (BOS). This means that offsets for MNES can be compensated for under the NSW BOS. Chapter 12 of the Revised BDAR sets out the Biodiversity credit report, a summary of the required credits in provided in the following tables.

Not all species requiring species credits were determined to have a significant residual impact under the EPBC Act. In addition, some species under the NSW BOS would require ecosystem credits. Ecosystem credits would also account for those species that are only listed under the EPBC Act, as the ecosystem credits aims to offset the PCTs/habitat for the species.

A summary of ecosystem credits required to offset the residual impacts associated with the amended project on threatened species and ecological communities is presented in Table 7.1 and species credit requirements for EPBC listed threatened species are summarised in Table 7.2.

Table 7.1 Summary of the total ecosystem credits required for EPBC threatened species and ecological communities

Threatened species and ecological communities	Significant residual impact	Impact area (ha)	Ecosystem credits[1]
Listed ecological communities			
The Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions	No	2.03	20
Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	No	0.59	18
Natural Grasslands of the Murray Valley Plains	Yes	81.05	4722
Seasonal Herbaceous Wetlands	No	0.19	10
Weeping Myall Woodlands	Yes	77.77	2031
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native	No	2.69	97
Listed threatened species			
Aphelocephala leucopsis (Southern Whiteface)	No	1251.47	33237
Botaurus poiciloptilus (Australasian Bittern)	No	249.4	3627
Calidris acuminata (Sharp-tailed Sandpiper)	No	0.19	10[2]
Climacteris picumnus victoriae (Brown Treecreeper (south-eastern))	No	3.33	118
Falco hypoleucos (Grey Falcon)	No	1230.47	33010
Gallinago hardwickii (Latham's Snipe)	No	277.20	4038
Grantiella picta (Painted Honeyeater)	No	382.52	9326
Hirundapus Caudacutus (White-throated Needletail)	No	819.70	19309
Melanodryas cucullata cucullata (Hooded Robin (south-eastern form))	No	659.92	10416
Neophema chrysostoma (Blue-winged Parrot)	No	1185.99	32373
Nyctophilus corbeni (Corben's Long-eared Bat)	No	38.59	319
Stagonopleura guttata (Diamond Firetail)	No	648.17	12731
Tringa nebularia (Common Greenshank)	No	0.19	10[3]
Pedionomus torquatus (Plains Wanderer)	No	77.55	4546
Rostratula australis (Australian Painted Snipe)	No	254.72	3786

(1) Ecosystem credit totals shown for TECs reflect the EPBC-listed TEC components only. Ecosystem credit totals shown for threatened fauna species reflect area of suitable habitat as identified by associated PCTs. Where a species is known to only inhabit woodland vegetation, areas of derived condition class have been removed. Where a species is listed as a dual credit species, ecosystem credit totals are been assessed for species where the Revised BDAR does not identify impacts to the species credit component of the listing.

(2) These species are not associated within any PCTs. They are known to use wetland habitats including riparian areas but may also use the grassland habitat. For the purpose of this assessment the credits are based on PCT 47 Swamp grassland wetland of the Riverine Plain.

(3) Special provisions have been given to this species where impacts to both the ecosystem credit and species credit component have been assessed.

Table 7.2 Summary of the total species credits required

Scientific name	Common name	Significant residual impact	Impact area (ha/count)	Credits required
Threatened flora				
Amphibromus fluitans	River Swamp Wallaby-grass	No	0.72	16
Austrostipa metatoris	–	No	1.07	40
Austrostipa wakoolica	–	No	65.03	975
Brachyscome muelleroides	Mueller Daisy	No	0.70	54
Brachyscome papillosa	Mossgiel Daisy	Yes	146.2	6605
Eleocharis obicis	Spike Rush	Yes	176.16	6783
Lepidium monoplocoides	Winged Peppercress	No	86.01	2935
Maireana cheelii	Chariot Wheels	Yes	169.49	6627
Sclerolaena napiformis	Turnip Copperburr	No	43.95	1121
Swainsona murrayana	Slender Darling-pea	No	322.47	12861
Swainsona plagiotropis	Red Darling-pea, Red Swainson-pea	No	46.12	1186
Swainsona recta	Small Purple-pea	No	0.62	19
Threatened fauna species				
Crinia sloanei	Sloane's Froglet	No	0.59	27
Litoria raniformis	Southern Bell Frog	Yes	34.63	880
Lophochroa leadbeateri	Pink Cockatoo	No	43.72	1118
Pedionomus torquatus[1]	Plains Wanderer	No	0.95	55
Polytelis swainsonii	Superb Parrot	No	1.08	39
Phascolarctos cinereus	Koala	No	138.41	3673

(1) Special provisions have been given to this species where impacts to both the ecosystem credit and species credit components have been assessed.

Attachment A

Likelihood of occurrence

A1. Threatened ecological communities

Community name	EPBC Act[1]	Source[2]	Description	Associated PCTs present	Likelihood
Mallee Bird Community of the Murray Darling Depression Bioregion	E	PMST	The distribution of the Mallee Bird Community is limited to IBRA bioregions and subregions that identify the major area of mallee habitats east of the Eyrean barrier (Murray Darling Depression, Riverina and Darling Riverine Plains). The Mallee Bird Community is an assemblage of 20 bird species that rely on mallee habitats (comprised of mallee specialists and mallee dependents) for their continued persistence within the Murray Darling Depression bioregion. The assemblage represents 11 families, the most common being the honeyeaters and wrens.	170	**Low** One associated PCT was recorded within the Indicative disturbance footprint (4.06 ha of PCT 170), however the Indicative disturbance footprint is outside of the indicative distribution for the TEC and no threatened birds associated with the TEC were recorded or considered likely to occur.
Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains	CE	PMST	The Seasonal Herbaceous Wetlands ecological community occurs in Victoria, south-eastern South Australia (SA) and southern New South Wales (NSW). The Seasonal Herbaceous Wetlands TEC are temporary freshwater wetlands that are inundated on a seasonal basis, typically filling after winter-spring rains, and then drying out. The vegetation is generally treeless and dominated by a herbaceous ground layer, often with a considerable graminoid component and with forbs present. The herbaceous species present are characteristic of wetter locations and are typically absent or uncommon in any adjoining dryland grasslands and woodlands. The dominant plants present are subject to seasonal and site conditions, and the diversity of the flora may range from relatively species-poor to species-rich composition.	47	**Recorded** The TEC was recorded in the Indicative disturbance footprint in the Murrumbidgee subregion.
Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	E	PMST	The Grey Box Grassy Woodlands TEC predominantly occurs on the drier edge of the temperate grassy eucalypt woodland belt. It ranges from the Narrabri district in central NSW through northern Victoria into South Australia. The community occupies a position in the landscape that is transitional between the temperate woodlands and forests of the lower slopes and tablelands of south-eastern Australia, and the semi-arid communities further inland. A tree canopy dominated by *Eucalyptus microcarpa* (Grey Box) is typically present. A range of other associated tree species may be present but do not dominate the ecological community. The understorey comprises a sparse shrub layer and a species-rich ground layer of grasses and herbs. Chenopods are often present, particularly in drier parts of the range. The ecological community includes patches of derived grassland where a tree canopy of Grey Box was known to have been present but has been removed, and the native ground layer remains largely intact.	237	**Recorded** The TEC was recorded in the Indicative disturbance footprint in the Murray Fans subregion.
Plains mallee box woodlands of the Murray Darling Depression, Riverina and Naracoorte Coastal Plain Bioregions	CE	PMST	Plains mallee box woodlands TEC includes plants, animals and other organisms associated with types of mallee woodlands (i.e. the assemblage comprises all biota) that are found in south-west New South Wales, north-west Victoria, and south-east South Australia. It is a medium to tall open mallee eucalypt woodland with a canopy typically dominated by 'mallee box' Eucalyptus species and an understorey in which tussock grasses may be prominent in relatively wet years, low chenopod shrubs occur in variable densities, and taller shrubs are typically sparse. The ecological community is associated with relatively medium-heavy textured soils on near-level to gently sloping plains.	170	**Low** While one associated PCT (PCT 170) was recorded within the Indicative disturbance footprint, no vegetation patches contained characteristic canopy species required to meet the listing criteria for the community.
Natural Temperate Grassland of the South Eastern Highlands	CE	PMST	Natural Temperate Grassland of the South Eastern Highlands occurs at altitudes up to approximately 1200 m in and around the South Eastern Highlands. It can also occur as low as 250 m. The ecological community is characterised by a dominance of native perennial tussock grasses, the tallest stratum of which is typically up to 1.0 m in height, when present. There is usually a second, lower stratum of shorter perennial and annual grasses and forbs growing between the taller tussocks, and there may be a third discontinuous stratum of even smaller forbs, grasses and cryptogams. Sedges and rushes may also occur, particularly in seasonally wet areas. A tree and shrub stratum may be present, but with only up to 10% projective foliage cover of each being present.	None	**Low** The Indicative disturbance footprint does not occur within the South Eastern Highlands bioregion and no associated PCTs occur within the Indicative disturbance footprint.

Community name	EPBC Act[1]	Source[2]	Description	Associated PCTs present	Likelihood
Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions	E	PMST	The Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions occur substantially within the two named bioregions. The nominated woodland's component communities are generally characterised as woodland or open woodland with a well developed ground stratum that is usually grassy, but also includes many subshrubs and herbs; some component communities have understoreys that are predominantly shrubby or herbaceous. Most component communities lack a well-developed tall shrub layer. Buloke is common to all component communities, but slender cypress-pine and grey box may be structurally dominant in some. The composition of the ground stratum varies considerably among component communities. The woodlands have been extensively cleared in the past, and the remnants that survive face ongoing major threats from incremental clearance, grazing by rabbits and stock, invasion by exotic plants, weedicide application and fertiliser drift.	20	**Recorded** The TEC was recorded in the Indicative disturbance footprint in the Murray Fans and Murrumbidgee subregions.
Natural Grasslands of the Murray Valley Plains	CE	PMST	Natural Grasslands of the Murray Valley Plains occur in south-west NSW, bounded by Swan Hill in the west, just north of Conargo in the north and Lockhart in the East, down to the Victorian Border. The Natural Grasslands of the Murray Valley Plains ecological community is a type of natural temperate grassland that has semi-arid characteristics, due to the lower rainfall where it occurs. The structure is an open grassland to forbland in which trees and tall shrubs are sparse to absent. The vegetation is dominated by the ground layer with range of perennial grasses, forbs and small shrubs. Characteristic genera present typically include: (for grasses) – *Rytidosperma* (for forbs) – *Arthropodium, Bulbine, Calotis, Chrysocephalum, Leptorhynchos, Minuria, Ptilotus, Rhodanthe, Sida and Swainsona;* and *Austrostipa, Chloris and Enteropogon*; (for small shrubs) – *Atriplex* and *Maireana*.	44, 45 & 46	**Recorded** The TEC was recorded in the Indicative disturbance footprint in the Murray Fans and Murrumbidgee subregions.
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	CE	PMST	White Box–Yellow Box–Blakely's Red Gum Grassy Woodland and Derived Native Grassland can occur either as woodland or derived native grassland (i.e. grassy woodland where the tree overstorey has been removed). It is characterised by a species-rich understorey of native tussock grasses, herbs and scattered shrubs (where shrub cover comprises less than 30% cover), and a dominance or prior dominance of White Box (*Eucalyptus albens*) and/or Yellow Box (*E. melliodora*) and/or Blakely's Red Gum (*E. blakelyi*) trees. In the Nandewar bioregion, Grey Box (*E. microcarpa* or *E. moluccana*) may also be dominant or codominant. In the woodland state, tree cover is generally discontinuous and of medium height with canopies that are clearly separated.	266 & 277	**Recorded** The TEC was recorded in the Indicative disturbance footprint in the Inland Slopes subregion.
Weeping Myall Woodlands	E	PMST	The Weeping Myall Woodlands occurs on the inland alluvial plains west of the Great Dividing Range in NSW and Queensland, with one small outlying patch in northern Victoria. It occurs in the Riverina, NSW South Western Slopes, Darling Riverine Plains, Brigalow Belt South, Brigalow Belt North, Murray-Darling Depression, Nandewar and Cobar Peneplain IBRA Bioregions. The Weeping Myall Woodlands occur in a range from open woodlands to woodlands, generally 4–12 m high, in which Weeping Myall (*Acacia pendula*) trees are the sole or dominant overstorey species. The understorey of Weeping Myall Woodlands often includes an open layer of shrubs above an open ground layer of grasses and herbs, though the ecological community can exist naturally either as a shrubby or a grassy woodland. In many areas, however, the shrub layer has disappeared through overgrazing and dieback events and the woodland now has a primarily grassy understorey. The ground layer includes a diversity of grasses and forbs and varies in species composition and cover depending on past and current grazing regimes, and the occurrence of recent rain.	26	**Recorded** The TEC was recorded in the Indicative disturbance footprint in the Murrumbidgee subregion.

(1) V= Vulnerable, E = Endangered or CE = Critically Endangered under the *Environment Protection and Biodiversity Conservation Act 1999*.

(2) PMST = Commonwealth Protected Matters Search tool.

A2. Threatened flora

Scientific name	Common name	BC Act[1]	EPBC Act[2]	Source	Habitat description and constraints	Associated PCTs present	Likelihood
Ammobium craspedioides	Yass Daisy	V	V	BAM-C, PMST	Found in moist or dry forest communities, Box-Gum Woodland and secondary grassland derived from clearing of these communities. Found from near Crookwell on the Southern Tablelands to near Wagga Wagga on the South Western Slopes. Most populations are in the Yass region.	266, 277 & 343	**Low** Indicative disturbance footprint occurs outside the known or predicted distribution of this species and is highly unlikely to occur. Not recorded during targeted seasonal surveys, however presence has been assumed in a small portion of remaining habitat where survey effort was not sufficient to exclude the species presence.
Amphibromus fluitans	Floating Swamp Wallaby-grass	V	V	BAM-C, PMST, BioNet	*Amphibromus fluitans* grows mostly in permanent swamps. The species needs wetlands which are at least moderately fertile, and which have some bare ground, conditions which are produced by seasonally fluctuating water levels. Habitats in south western NSW include swamp margins in mud, dam and tank beds in hard clay and in semi-dry mud of lagoons with *Potamogeton* and *Chamaeraphis* species.	11, 17, & 160	**Moderate.** Records associated with the Murray River and tributaries. Habitat has been recorded within the Indicative disturbance footprint and presence has been assumed where adequate survey effort was not possible.
Austrostipa metatoris	A spear-grass	V	V	BAM-C, PMST, BioNet	Grows in sandy areas of the Murray Valley; habitats include sandhills, sandridges, undulating plains and flat open mallee country, with red to red-brown clay-loam to sandy-loam soils. Most records occur in the Murray Valley with sites including Cunninyeuk Station, Stony Crossing, Kyalite State Forest (now part of Murrumbidgee Valley Regional Park) and Lake Benanee. Scattered records also occur in central NSW including Lake Cargelligo, east of Goolgowi, Condobolin and south west of Nymagee. Otherwise only known from near Bordertown in south east South Australia, where it may be locally extinct.	7 & 28	**Moderate.** Records associated with the Murray River Valley. Not recorded within the Indicative disturbance footprint during targeted seasonal surveys. However, presence has been assumed where targeted surveys were not possible.
Austrostipa wakoolica	A spear-grass	E	E	BAM-C, PMST, BioNet	Grows on floodplains of the Murray River tributaries, in open woodland on grey, silty clay or sandy loam soils; habitats include the edges of lignum swamps with box and mallee; creek banks in grey, silty clay; mallee and lignum sandy-loam flat; open Cypress Pine Forest on low sandy range; and a low, rocky rise.	17, 26, 28, & 237	**Moderate.** Records associated with the Murray River and tributaries. Not recorded within the Indicative disturbance footprint during targeted seasonal surveys. However, presence has been assumed where targeted surveys were not possible.
Brachyscome muelleroides	Mueller Daisy	V	V	BAM-C, PMST, BioNet	Grows in damp areas on the margins of claypans in moist grassland with *Pycnosorus globosus*, *Agrostis avenacea* and *Austrodanthonia duttoniana*. Also, recorded from the margins of lagoons in mud or water, and in association with *Calotis anthemoides*. The Claypan Daisy occurs in the Wagga Wagga, Narranderra, Tocumwal and Walbundrie areas.	44, 45, 46 & 47	**Moderate.** Habitat for the species is present within the Indicative disturbance footprint. Presence has been assumed where targeted survey effort was not possible.

Scientific name	Common name	BC Act[1]	EPBC Act[2]	Source	Habitat description and constraints	Associated PCTs present	Likelihood
Brachyscome papillosa	Mossgiel daisy	V	V	BAM-C, PMST, BioNet	Recorded primarily in clay soils on Bladder Saltbush (*Atriplex vesicaria*) and Leafless Bluebush (*Maireana aphylla*) plains, but also in grassland and in Inland Grey Box (*Eucalyptus microcarpa*) – Cypress Pine (*Callitris* spp.) woodland. The Mossgiel Daisy is endemic to NSW and chiefly occurs within the Riverina Bioregion, from Mossgiel in the north, Murrumbidgee Valley (Yanga) National Park in the south west to Urana in the south east. Sites are scattered across this Bioregion including the Jerilderie area, the Hay Plain (Maude and Oxley) and around Darlington Point. In addition, there are a number of records from the Willandra Lakes World Heritage Area (including Mungo National Park) with a north-western outlier at Byrnedale Station, north of Menindee. The only known site on South Western Slopes is Ganmain Reserve.	13, 15, 24, 44, 45, 46, 157, 159, 160, 163, 164 & 216	**Recorded.** Several populations of the species have been recorded within the Indicative disturbance footprint. Species has been assumed present where adequate targeted survey effort was not possible.
Caladenia arenaria	Sand-hill Spider Orchid	E	E	BAM-C, PMST	Occurs in woodland with sandy soil, especially that dominated by White Cypress Pine (*Callitris glaucophylla*). Sand-hill Spider Orchid is restricted to the Riverina in NSW and only occurs in five locations between Urana and Narranderra that are severely fragmented. There are no records within proposed Indicative disturbance footprint.	28	**Low.** Vegetation associated with this species does not meet the geographic restrictions for this species.
Caladenia concolor	Crimson Spider-orchid	E	V	PMST	Occurs on granite ridges and slopes in dry open woodland or open forest, typically on shallow, well-drained soils derived from granite. Habitat is commonly associated with open eucalypt woodland with a sparse grassy or herbaceous understorey and patches of leaf litter. The species grows as a terrestrial orchid within the ground layer, often in relatively undisturbed sites with low competition from dense shrub.	Nil	**Low.** Indicative disturbance footprint occurs outside the known or predicted distribution of this species and no known records within the locality. Unlikely to occur.
Calotis moorei	A Burr Daisy	E	E	BAM-C, BioNet	The species grows in sandy soil and appears to be associated with Acacia woodlands and chenopod shrublands. At Mt Mulyah, *Calotis moorei* grows in an area cleared of original *Acacia cambagei* woodland and subsequently invaded by *Dodonaea viscosa* subsp. *angustissima* which repressed the growth of herbaceous species.	23, 157 & 170	**Low.** Based on the species profile (SPRAT), the Indicative disturbance footprint occurs outside of the species distribution range.
Eleocharis obicis	A spike rush	V	V	BioNet	Grows in ephemerally wet situations such as roadside mitre drains and depressions, usually in low-lying grasslands. Found near Condobolin and Hay, as well as being known from an old collection from the Barrier Range near Broken Hill. Found near Condobolin and Hay, as well as being known from an old collection from the Barrier Range near Broken Hill. The later collection was made on the Lachlan River floodplain at Micabil, near Condobolin.	10, 11, 13, 17, 24, 47, 53, 157, 159, 160, 163, 164, 216 & 237	**Recorded.** Several populations of this species have been recorded from within the Indicative disturbance footprint within gilgais on light grey clays in chenopod shrublands and canegrass wetlands. Species has been assumed present in habitats not subject to adequate survey effort.
Euphrasia arguta	–	CE	C	BAM-C, BioNet	Historic records of the species noted the following habitats: 'in the open forest country around Bathurst in sub humid places', 'on the grassy country near Bathurst', and 'in meadows near rivers'. Plants from the Nundle area have been reported from eucalypt forest with a mixed grass and shrub understorey; here, plants were most dense in an open disturbed area and along the roadside, indicating the species had regenerated following disturbance. *Euphrasia arguta* was rediscovered in the Nundle area of the NSW north western slopes and tablelands in 2008. Prior to this, it had not been collected for 100 years. Historically, *Euphrasia arguta* has only been recorded from relatively few places within an area extending from Sydney to Bathurst and north to Walcha. The Royal Botanic Gardens Specimen Register records an additional location reported and vouchered in 2002 from near the Hastings River; and *Euphrasia arguta* was also recorded from the Barrington Tops in 2012.	226 & 277	**Low.** Most of the known records include Nundle NSW in the north western slopes and tablelands. Another record in Barrington Tops in 2012. Both locations are >500 kms from the Indicative disturbance footprint.

Scientific name	Common name	BC Act[1]	EPBC Act[2]	Source	Habitat description and constraints	Associated PCTs present	Likelihood
Grevillea wilkinsonii	Tumut Grevillea	CE	CE	BioNet	The Tumut Grevillea has a highly restricted distribution in the NSW South-west Slopes region. Its main occurrence is along a 6 km stretch of the Goobarragandra River approximately 20 km east of Tumut where about 1,000 plants are known. The other occurrence is a small population that straddles the boundary of two private properties at Gundagai where only eight mature plants survive. There are no habitat constraints listed. At the Goobarragandra River sites the species generally grows in close proximity to the water, at altitudes between 310 and 340 m. The population at Gundagai is growing on the upper slope of a steep hill on Serpentinite rock. The species recruits most readily where there is some bare ground.	266	**Low.** Based on the species profile (SPRAT), the Indicative disturbance footprint occurs outside of the species distribution range.
Indigofera efoliata	Leafless Indigo	E	E	BioNet	The Leafless Indigo is very rare and was presumed extinct with the last known collection made in 1955 with three unvouchered reports from Goonoo State Forest in 1963. In spring 2021 the species was rediscovered near Geurie. Its known only from a few collections in the Dubbo area. Known sites were located along the Dubbo to Minore railway line and road, on Wallaringa and Geurie properties and in Goonoo State Forest. Herbarium records note the species as growing on slight rises amongst ironstone formation in stony red-brown sandy loam.	Nil	**Low.** Based on the species profile (SPRAT), the Indicative disturbance footprint occurs outside of the species distribution range.
Leucochrysum albicans subsp. tricolor	Hoary Sunray	E	E	PMST	Endemic to south-eastern Australia, where it is currently known from three geographically separate areas in Tasmania, Victoria and south-eastern NSW and ACT. In NSW it currently occurs on the Southern Tablelands adjacent areas in an area roughly bounded by Albury, Bega and Goulburn, with a few scattered localities know from beyond this region. Occurs in a wide variety of grassland, woodland and forest habitats, generally on relatively heavy soils. Can occur in modified habitats such as semi-urban areas and roadsides.	Nil	**Low** There are no records within 10 km of the Indicative disturbance footprint and no associated PCTs occur within the Indicative disturbance footprint.
Lepidium aschersonii	Spiny Peppercress	V	V	PMST	Found on ridges of gilgai clays dominated by Brigalow (*Acacia harpophylla*), Belah (*Casuarina cristata*), Buloke (*Allocasuarina luehmannii*) and Grey Box (*Eucalyptus microcarpa*). In the south has been recorded growing in Bull Mallee (*Eucalyptus behriana*). Often the understorey is dominated by introduced plants. The species grows as a component of the ground flora, in grey loamy clays. Vegetation structure varies from open to dense, with sparse grassy understorey and occasional heavy litter. Not widespread, occurring in the marginal central-western slopes and north-western plains regions of NSW (and potentially the south western plains). In the north of the State recent surveys have recorded a number of new sites including Brigalow Nature Reserve, Brigalow State Conservation Area, Leard State Conservation Area and Bobbiwaa State Conservation Area. Also known from the West Wyalong in the south of the State. Records from Barmedman and Temora areas are likely to be no longer present. Approximately 50% of the total *Lepidium aschersonii* recorded for Australia occurs in NSW.	26	**Low.** Nearest recorded population occurs to the north of the Murrumbidgee River which is over 50 km from the Indicative disturbance footprint.
Lepidium monoplocoides	Winged Peppercress	E	E	BAM-C, PMST, BioNet	Occurs on seasonally moist to waterlogged sites, on heavy fertile soils, with a mean annual rainfall of around 300–500 mm. Predominant vegetation is usually an open woodland dominated by *Allocasuarina luehmannii* (Bulloak) and/or eucalypts, particularly *Eucalyptus largiflorens* (Black Box) or *Eucalyptus populnea* (Poplar Box).	13, 15, 24, 26, 45, 46, 47, 159, 160, 163, 170, 216 & 237	**Recorded.** Several populations recorded within or in close proximity to the Indicative disturbance footprint during targeted seasonal survey undertaken by WSP. Species has been assumed present where adequate survey effort was not possible within associated habitat types.
Lepidium pseudopapillosum	Erect Peppercress	V	–	BAM-C, BioNet	Occurs on granite ridges and slopes in dry open woodland or open forest, typically on shallow, well-drained soils derived from granite. Habitat is commonly associated with open eucalypt woodland with a sparse grassy or herbaceous understorey and patches of leaf litter. The species grows as a terrestrial orchid within the ground layer, often in relatively undisturbed sites with low competition from dense shrub.	20	**Low.** Indicative disturbance footprint occurs outside the known or predicted distribution of this species and no known records within the locality. Unlikely to occur.

Scientific name	Common name	BC Act[1]	EPBC Act[2]	Source	Habitat description and constraints	Associated PCTs present	Likelihood
Maireana cheelii	Chariot Wheels	V	V	BAM-C, PMST, BioNet	Usually found on heavier, grey clay soils with *Atriplex vesicaria* (Bladder Saltbush). Recorded on the Hay Plain in *Atriplex vesicaria, Maireana aphylla* and *Acacia homalophylla* shrublands. Soils include heavy brown to red-brown clay-loams, hard cracking red clay, other heavy texture-contrast soils. Tends to grow in shallow depressions, often on eroded or scalded surfaces, and does not extend to the higher soils in the habitat. It has been found on the edges of bare, windswept claypans, in shallow depressions of eroded surfaces where rainwater collects and on a "shelf" in the crabhole complex of heavy grey soils. Associated species include *Atriplex vesicaria, Maireana pentagona, M. excavata, M. ciliata, Cressa cretica, Avena fatua* and *Acacia homalophylla*.	15, 26, 44, 46, 157 & 164	**Recorded.** Several populations recorded within or in close proximity to the Indicative disturbance footprint during targeted seasonal survey undertaken by WSP. Species has been assumed present where adequate survey effort was not possible within associated habitat types.
Myriophyllum porcatum	Ridged Water-milfoil	–	V	PMST	Occurs in shallow, ephemeral and seasonal wetlands, including lakes, swamps, rock pools in granite outcrops, waterholes in claypans and highly modified habitat including farm dams and drainage lines (EPBC listing advice).	Nil	**Low.** Nearest known population occurs south of the Murray River in Victoria and is greater than 50 km from the Indicative disturbance footprint.
Prasophyllum petilum *(Prasophyllum sp. Wybong)*	Tarengo Leek Orchid	E	E	BAM-C, PMST	Grows in patchy woodland in fertile soils. More specifically, grows in open sites within Natural Temperate Grassland at the Boorowa and Delegate sites. Also grows in grassy woodland in association with River Tussock *Poa labillardieri*, Black Gum *Eucalyptus aggregata* and tea-trees *Leptospermum* spp. near Queanbeyan and within the grassy ground layer dominated by Kangaroo Grass under Box-Gum Woodland at Ilford (and Hall, ACT).	Nil	**Low.** Based on the species profile (SPRAT), the species distribution range occurs outside of the Indicative disturbance footprint so it is highly unlikely for the species to be impacted by the amended project. The species was not recorded during targeted seasonal surveys, however presence has been assumed in a small portion of remaining habitat where survey effort was not sufficient to exclude the species presence.
Pterostylis despectans	–	CE	E	BAM-C	The species occurs as very small, fragmented populations in NSW, central Victoria and SA. In NSW, the only known population is restricted to a small area within the Yellow Water Hole to Barnes Crossing Travelling Stock Reserve (TSR Riverina 120) approximately 10km north-east of Moama. The NSW population occurs in natural forb-rich grassland on flat alluvial plains in *Acacia pendula* woodland. The grassland is dominated by *Austrodanthonia* sp., *Austrostipa aristiglumis* and *Austrostipa scabra*.	20, 44 & 86	**Low.** Based on the species profile (SPRAT), the Indicative disturbance footprint occurs outside of the species distribution range. However, presence has been assumed in a small portion of remaining habitat where survey effort was not sufficient to exclude the species presence.
Sclerolaena napiformis	Turnip Copperburr	E	E	BAM-C, PMST, BioNet	Confined to remnant grassland habitats on clay-loam soils. Grows on level plains in tussock grassland of *Austrostipa nodosa* and *Chloris truncata*, in grey cracking clay to red-brown loamy clay. Sites are roadside travelling stock routes and reserves subject to sheep grazing. Associated species include *Austrodanthonia duttoniana, Enteropogon acicularis, Austrostipa nodosa, Chloris truncata, Lolium rigidum, Swainsona murrayana, S. plagiotropis, S. procumbens, Rhodanthe corymbiflora, Calotis scabiosifolia, Microseris lanceolata, Acacia pendula* and various chenopods.	26, 44 & 46	**Moderate.** Potential habitat present within the Indicative disturbance footprint. Not recorded within the Indicative disturbance footprint during targeted seasonal surveys. However, presence has been assumed where targeted surveys were not possible.
Senecio behrianus	Stiff Groundsel, Behr's Groundsel	Extinct	E	PMST	Species grows on swampy soil and sandy clay in seasonally inundated areas on flats or close to riverbanks. *Senecio behrianus* was endemic to south-eastern Australia, where it once occurred in South Australia, New South Wales and Victoria. It is presumed extinct in South Australia and New South Wales and is now only known only from 5 wild and 2 reintroduced populations in Victoria.	Nil	**Low.** The species is considered extinct in NSW, although there are historic records along the Murray River in Victoria. The species was not recorded in the Indicative disturbance footprint despite targeted surveys during optimum season.

Scientific name	Common name	BC Act[1]	EPBC Act[2]	Source	Habitat description and constraints	Associated PCTs present	Likelihood
Senecio macrocarpus	Large-fruit Fireweed, Large-fruit Groundsel	–	V	PMST	Found in woodland, grassland, and sedgeland. In NSW, known to occur in Tablelands east and north of the Australian Capital Territory. Also occurs in Victoria and South Australia.	Nil	**Low.** No suitable habitat recorded within the Indicative disturbance footprint.
Solanum karsense	Menindee Nightshade	V	V	BAM-C	Grows in occasionally flooded depressions with heavy soil, including level river floodplains of grey clay with Black Box and Old Man Saltbush, and open treeless plains with solonized brown soils. Habitats are generally lake beds or floodplains of heavy grey clays with a highly self-mulching surface. Also found on sandy floodplains and ridges and in calcareous soils, red sands, red-brown earths and loamy soils.	13, 15, 17, 24, 159, 160 & 166	**Low.** The Indicative disturbance footprint occurs outside the known or predicted distribution of this species and the species was not recorded during targeted seasonal surveys. However, presence has been assumed in a small portion of remaining habitat where survey effort was not sufficient to exclude the species presence.
Swainsona murrayana	Slender Darling Pea	V	V	BAM-C, PMST, BioNet	The species has been collected from clay-based soils, ranging from grey, red and brown cracking clays to red-brown earths and loams. Grows in a variety of vegetation types including bladder saltbush, black box and grassland communities on level plains, floodplains and depressions and is often found with *Maireana* species. Plants have been found in remnant native grasslands or grassy woodlands that have been intermittently grazed or cultivated.	15, 17, 23, 24, 26, 28, 44, 45, 46, 157, 163, 164 & 216	**Recorded.** Multiple populations recorded within or in close proximity to the Indicative disturbance footprint during targeted seasonal survey undertaken by WSP. Species has been assumed present where adequate survey effort was not possible within associated habitat types.
Swainsona plagiotropis	Red Darling Pea	V	V	BAM-C, PMST, BioNet	Grows on flat grassland and in heavy red soil, often on roadsides and especially in table drains. Soils are derived from quaternary sediments and are usually red-brown clay-loams. The species is absent from black low-lying soils. Recorded from roadsides, rail reserves, stock routes and areas of lightly grazed unimproved pasture comprising *Austrodanthonia*, *Enteropogon acicularis* and *Austrostipa* grassland communities.	26, 44, 45 & 46	**Moderate.** Potential habitat present within the Indicative disturbance footprint. Not recorded within the Indicative disturbance footprint during targeted seasonal surveys. However, presence has been assumed where targeted surveys were not possible.
Swainsona pyrophila	Yellow Swainson-pea	V	V	PMST	Grows in mallee scrub on sandy or loamy soil, usually found only after fire. Sites include cleared and burnt mallee scrub on red loam to sand, previously burnt *Eucalyptus dumosa* mallee, disturbed woodland in sheltered aspects, a bulldozed firebreak adjacent to wheat paddocks, roadsides, claypans and at the edge of fire ash.	Nil	**Low.** No associated habitat within the Indicative disturbance footprint.
Swainsona recta	Small Purple-pea	E	E	BAM-C, PMST, BioNet	Before European settlement Small Purple-pea occurred in the grassy understorey of woodlands and open-forests dominated by Blakely's Red Gum *Eucalyptus blakelyi*, Yellow Box *E. melliodora*, Candlebark Gum *E. rubida* and Long-leaf Box *E. goniocalyx.* Grows in association with understorey dominants that include Kangaroo Grass *Themeda australis*, poa tussocks *Poa* spp. and spear-grasses *Austrostipa* spp. Small Purple-pea was recorded historically from places such as Carcoar, Culcairn and Wagga Wagga where it is probably now extinct. Populations still exist in the Queanbeyan and Wellington-Mudgee areas. Over 80% of the southern population grows on a railway easement. It is also known from the ACT and a single population of four plants near Chiltern in Victoria.	266 & 277	**Moderate.** Potential habitat present within the Indicative disturbance footprint. Not recorded within the Indicative disturbance footprint during targeted seasonal surveys. However, presence has been assumed where targeted surveys were not possible.

(1) Indicated a species is listed V= Vulnerable, E = Endangered or CE = Critically Endangered under the Biodiversity Conservation Act 2016.

(2) Indicates a species is listed V = Vulnerable, E = Endangered or CE = Critically Endangered under the Environmental Protection and Biodiversity Conservation Act 1999.

A3. Threatened fauna

Scientific name	Common name	BC Act[1]	EPBC Act[2]	Source	Habitat description and constraints	Associated PCTs present	Likelihood of occurrence
Amphibians							
Crinia sloanei	Sloane's Froglet	V	E	BAM-C, PMST	Associated with periodically inundated areas in grassland, woodland and disturbed habitats. Sloane's Froglet has been recorded from widely scattered sites in the floodplains of the Murray-Darling Basin, with most records in the Darling Riverine Plains, NSW South Western Slopes and Riverina bioregions in New South Wales.	237	**Moderate.** Marginal potential habitat within the Indicative disturbance footprint. Not recorded during targeted surveys, however limited survey undertaken. Associated habitat present in Murray Fans subregion.
Litoria booroolongensis	Booroolong Frog	E	E	BAM-C, PMST	Live along permanent streams with some fringing vegetation cover such as ferns, sedges or grasses. The species would also occur on or near cobble banks and other rock structures within stream margins.	343, 346, 277	**Low.** The specific microhabitats desired by this species are absent from the Indicative disturbance footprint.
Litoria raniformis	Growling Grass Frog, Southern Bell Frog	E	V	BAM-C, PMST, BioNet	Usually found in or around permanent or ephemeral Black Box/Lignum/Nitre Goosefoot swamps, Lignum/Typha Swamps, and River Red Gum swamps or billabongs along floodplains and river valleys. Rivers, tributaries, and irrigation channels form habitat.	7, 10, 11, 13, 17, 24, 53	**Recorded.** This species has been recorded from WSP surveys within the Indicative disturbance footprint.
Avifauna							
Anthochaera phrygia	Regent Honeyeater	CE	C	BAM-C, PMST, BioNet	The species inhabits dry open forest and woodland, particularly Box-Ironbark forests and woodland and prefers wet, fertile sites such as along creek flats, broad river valleys and foothills. Riparian forests with *Casuarina cunninghamiana* and *Amyema cambagei* are important for feeding and breeding. Important food trees include *Eucalyptus sideroxylon* (Mugga Ironbark), *E. albens* (White Box), *E. melliodora* (Yellow Box) *and E. leucoxylon* (Yellow Gum).	7, 44, 58, 86, 216.	**Low.** In NSW the distribution is very patchy and mainly confined to the breeding areas and surrounding fragmented woodlands. There are no records from locality and no known breeding areas in the vicinity of the Indicative disturbance footprint.
Aphelocephala leucopsis	Southern Whiteface	V	V	PMST, BioNet	Southern Whiteface occur across most of mainland Australia south of the tropics, from the north-eastern edge of the Western Australian wheatbelt, east to the Great Dividing Range. Southern whitefaces live in a wide range of open woodlands and shrublands where there is an understorey of grasses or shrubs, or both. These areas are usually in habitats dominated by acacias or eucalypts on ranges, foothills and lowlands, and plains.	7, 10, 11, 13, 15, 17, 20, 23, 24, 26, 28, 44, 45, 46, 58, 157, 159, 160, 163, 164, 170, 216, 237, 266 & 277	**Recorded.** This species has been recorded from WSP surveys within the Indicative disturbance footprint.
Arenaria interpres	Ruddy Turnstone	V	V, M	BioNet	Occurs primarily in coastal intertidal habitats, including rocky shores, reefs, exposed mudflats, sandy beaches and tidal flats. The species forages in the upper intertidal zone, particularly among rocks, seaweed and shell debris. In Australia it occurs almost exclusively in coastal environments during the non-breeding season, with occasional use of artificial structures such as breakwaters and harbour edges.	47	**Low.** Limited habitat is present within the Indicative disturbance footprint.
Botaurus poiciloptilus	Australasian Bittern	E	E	BAM-C, PMST, BioNet	In NSW they may be found over most of the state except for the far north-west. Favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes (*Typha* spp.) and spikerushes (*Eleocharis* spp.). Breeding occurs in summer from October to January; nests are built in secluded places in densely vegetated wetlands on a platform of reeds.	10, 11, 13, 17, 24, 160	**Moderate.** Habitat within the Indicative disturbance footprint is considered suitable for this species, and it has been recorded within the locality.

Scientific name	Common name	BC Act[1]	EPBC Act[2]	Source	Habitat description and constraints	Associated PCTs present	Likelihood of occurrence
Calidris acuminata	Sharp-tailed Sandpiper	–	V, M	PMST, BioNet	Occurs in a variety of habitats: tidal mudflat, mangrove swamps, saltmarshes, shallow fresh, brackish, salt inland swamps and lakes; flooded and irrigated paddocks, sewage farms and commercial salt fields.	N/A	**Moderate.** This species has been recorded within various habitat types and consistently throughout the locality when conditions are favourable. Although not associated with any present PCTs officially, habitats present may be considered suitable based on this species diverse habitat preferences.
Calidris canutus	Red Knot	V	E; M	BioNet	Occupies intertidal mudflats, sandflats and sandy beaches in coastal and estuarine environments, where it forages on invertebrates in soft sediments. Roosting habitat includes supratidal sandbanks, beaches, spits and saltmarsh margins. In Australia, the species is restricted to coastal habitats during the non-breeding season and is highly dependent on large, undisturbed intertidal areas.	47	**Low.** Limited habitat is present within the Indicative disturbance footprint.
Calidris ferruginea	Curlew Sandpiper	E	CE, M	BAM-C, PMST, BioNet	Occur around the coasts and are also quite widespread inland, though in smaller numbers. Mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes, and bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters and are occasionally recorded around floodwaters.	24, 53, 47	**Low.** This species is predominantly coastal, and preferred microhabitats are not present within the Indicative disturbance footprint. No records in locality.
Calidris tenuirostris	Great Knot	V	V, M	BioNet	Occurs within sheltered, coastal habitats containing large, intertidal mudflats or sandflats, including inlets, bays, harbours, estuaries and lagoons. Often recorded on sandy beaches with mudflats nearby, sandy spits and islets and sometimes on exposed reefs or rock platforms. Migrates to Australia from late August to early September.	N/A	**Low.** No associated habitat for this species has been identified within the Indicative disturbance footprint.
Callocephalon fimbriatum	Gang-gang Cockatoo	V	E	BAM-C, PMST	The Gang-gang Cockatoo is distributed from southern Victoria through south- and central-eastern New South Wales. In spring and summer, generally found in tall mountain forests and woodlands, particularly heavily timbered and mature wet sclerophyll forests. In autumn and winter, the species often moves to lower altitudes in drier more open eucalypt forests and woodlands, particularly box-gum and box-ironbark assemblages, or in dry forest in coastal areas and often found in urban areas.	266, 277 & 343.	**Low**. This species has associated habitat within the Indicative disturbance footprint which has been subject to adequate survey where the species has not been identified.
Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo	V	V	BAM-C, PMST	Glossy Black-cockatoos are uncommon although widespread throughout suitable forest and woodland habitats, from the central Queensland coast to East Gippsland in Victoria, and inland to the southern tablelands and central western plains of NSW, with a small population in the Riverina. Feeds almost exclusively on the seeds of several species of she-oak (*Casuarina* and *Allocasuarina* species). Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur. *Allocasuarina littoralis* and *A. torulosa* are important foods. Inland populations feed on a wide range of sheoaks, including *A. diminuta*, and *A. gymnanthera*. *Casuarina cristata* is also utilised and may be a critical food source for some populations. In the Riverina, birds are associated with hills and rocky rises supporting Drooping Sheoak but also recorded in open woodlands dominated by Belah. Dependent on large hollow-bearing eucalypts for nest sites.	266, 343, 346.	**Low.** This species has associated PCTs present within the Indicative disturbance footprint, however, no appropriate habitat was found through targeted surveys.

Scientific name	Common name	BC Act[1]	EPBC Act[2]	Source	Habitat description and constraints	Associated PCTs present	Likelihood of occurrence
Climacteris picumnus victoriae	Brown Treecreeper (south-eastern)	V	V	PMST, BAM-C, BioNet	Found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and *Eucalyptus camaldulensis* forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses; usually not found in woodlands with a dense shrub layer; fallen timber is an important habitat component for foraging; also recorded, though less commonly, in similar woodland habitats on the coastal ranges and plains. The western boundary of the range of *Climacteris picumnus victoriae* runs approximately through Corowa, Wagga Wagga, Temora, Forbes, Dubbo and Inverell, intergrading along this line with *C. picumnus picumnus* which occupies the remainder of the state.	237, 266, 277 & 343.	**Recorded.** Recorded from WSP surveys. BioNet records have identified individuals of this species within the Indicative disturbance footprint. Additionally, suitable habitat for this species occurs within the Indicative disturbance footprint.
Falco hypoleucos	Grey Falcon	V	V	PMST, BioNet, BAM-C	Sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. The breeding range is now mostly confined to arid parts of the range. Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast. Also occurs near wetlands where surface water attracts prey.	10, 11, 13, 15, 17, 20, 22, 23, 24, 26, 28, 44, 45, 46, 47, 58, 157, 159, 160, 163, 164, 166, 170, 216, 237.	**Recorded.** BioNet records have identified individuals of this species within the Indicative disturbance footprint. Additionally, suitable habitat for this species occurs within the Indicative disturbance footprint.
Gallinago hardwickii	Latham's Snipe	–	V, M	PMST, BioNet	Occurs in freshwater or brackish wetlands generally near protective vegetation cover. This species feeds on small invertebrates, seeds and vegetation. It migrates to the northern hemisphere to breed.	7, 10, 11, 13, 15, 17, 20, 28, 44, 86, 160, 163, 164, 216, 237	**Moderate.** This species has been recorded throughout the locality when conditions are favourable and associated habitat identified within the Indicative disturbance footprint.
Grantiella picta	Painted Honeyeater	V	V	PMST, BAM-C, BioNet	The Painted Honeyeater is nomadic and occurs at low densities throughout its range. The greatest concentrations of the bird and almost all breeding occurs on the inland slopes of the Great Dividing Range in NSW, Victoria, and southern Queensland. Inhabits Boree/Weeping Myall (*Acacia pendula*), Brigalow (*A. harpophylla*) and Box-Gum Woodlands and Box-Ironbark Forests. A specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus Amyema.	7, 10, 11, 13, 15, 20, 23, 26, 28, 58, 86, 237, 266, 277, 319 & 343.	**Recorded.** This species was recorded during survey in September 2025. Potential habitat for this species within the indicative disturbance footprint and BioNet records within locality.
Hirundapus caudacutus	White-throated Needletail	–	V, M	PMST, BAM-C, BioNet	Widespread in eastern and south-eastern Australia. In eastern Australia, it is recorded in all coastal regions of QLD and NSW, extending inland to the western slopes of the Great Divide and occasionally onto the adjacent inland plains. The species is widespread in Victoria, but there are few records in Western VIC outside The Grampians and the South West. It is almost exclusively aerial, from heights of less than 1m up to more than 1000 m above the ground. Because they are aerial, it has been stated that conventional habitat descriptions are inapplicable, but there are, nevertheless, certain preferences exhibited by the species. Although they occur over most types of habitats, they are probably recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland. They also commonly occur over heathland, but less often over treeless areas, such as grassland or swamps. When flying above farmland, they are more often recorded above partly cleared pasture, plantations, or remnant vegetation at the edge of paddocks.	7, 10, 11, 13, 15, 17, 24, 26, 44, 45, 46, 47, 157, 160, 216, 237, 266, 277, 319 & 343.	**Moderate** Extensive suitable habitat for this species occurs within the Indicative disturbance footprint, likely to occur in airspace above the Indicative disturbance footprint.
Lathamus discolor	Swift Parrot	E	CE, M	PMST, BAM-C, BioNet	Migrates to the Australian south-east mainland between February and October. Occurs on the mainland in areas where Eucalypts are flowering profusely or where there is abundant lerp infestations. Favoured trees include *Eucalyptus robusta*, *Corymbia maculata*, *C. gummifera*, *E. tereticornis*, *E. sideroxylon*, and *E. albens*. Commonly used lerp infested trees include *E. microcarpa*, *E. moluccana*, *E. pilularis*, and *E. melliodora*.	7, 10, 11, 13, 15, 24, 26, 86, 237, 266, 277, 319 & 343.	**Moderate** The Indicative disturbance footprint contains potential foraging habitat for migrating individuals.

Scientific name	Common name	BC Act[1]	EPBC Act[2]	Source	Habitat description and constraints	Associated PCTs present	Likelihood of occurrence
Leipoa ocellata	Malleefowl	E	V	PMST, BAM-C	The stronghold for this species in NSW is the mallee in the south west centred on Mallee Cliffs NP and extending east to near Balranald and scattered records as far north as Mungo NP. Predominantly inhabit mallee communities, preferring the tall, dense and floristically-rich mallee found in higher rainfall (300–450 mm mean annual rainfall) areas.	N/A	**Low.** Although one PCT within the Indicative disturbance footprint is associated with this species, generally the Indicative disturbance footprint is not considered suitable as this species prefers mallee communities found further west than the Indicative disturbance footprint.
Limosa limosa	Black-tailed Godwit	V	E, M	PMST, BioNet	Primarily a coastal species, usually found in sheltered bays, estuaries, and lagoons with large intertidal mudflats and/or sandflats. Further inland it can also be found on mudflats and in water less than 10 cm deep, around muddy lakes and swamps. Records in western NSW indicate that a regular inland passage is used by the species, as it may occur around any of the large lakes in the western areas during summer, when the muddy shores are exposed.	Nil	**Low.** While marginal potential habitat for this species is present within the Indicative disturbance footprint, species is primarily coastal and no records occur within the locality.
Lophochroa leadbeateri	Pink Cockatoo	V	E	PMST, BAM-C, BioNet	Found across the arid and semi-arid inland, including north-west VIC. In NSW it is found regularly as far east as the locality of Bourke and Griffith, and sporadically further east than that. Inhabits a wide range of treed and treeless inland habitats, always within easy reach of water. Feeds mostly on the ground, especially on the seeds of native and exotic melons and on the seeds of species of saltbush, wattles and cypress pines.	7, 10, 11, 13, 15, 20, 23, 26, 28, 45, 58, 159, 163, 170 & 237.	**Recorded.** Individuals were recorded in close proximity to the Indicative disturbance footprint. Additionally, extensive suitable habitat for this species occurs within the Indicative disturbance footprint.
Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)	E	E	PMST, BioNet	The south-eastern form of Hooded Robin (subspecies *cucullata*) is found from Brisbane to Adelaide and throughout much of inland NSW, with the exception of the extreme north-west, where it is replaced by subspecies *M. c. picata*. Prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas. Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses.	7, 10, 11, 13, 15, 20, 23, 26, 28, 58, 86, 170 237, 266, 277, 319 & 343.	**Moderate**. The Indicative disturbance footprint contains habitat suitable for this species and is within the known distribution of this species.
Neophema chrysostoma	Blue-winged Parrot	V	V, M	PMST, BioNet	Blue-winged parrots are partial migrants, variable numbers of birds migrate across Bass Strait in winter but breed on mainland Australia south of the Great Dividing Range in southern Victoria. During the non-breeding period, from autumn to early spring, birds are recorded from northern Victoria, eastern South Australia, south-western Queensland and western New South Wales, with some birds reaching south-eastern New South Wales. The species tends to favour grasslands and grassy woodlands and are often found near wetlands, both near the coast and in semi-arid zones. The species has also been seen in altered environments such as paddocks, airfields, and golf courses.	7, 11, 13, 15, 17, 24, 26, 28, 44, 45, 46, 58, 157, 159, 160, 163, 164, 170, 216	**Recorded.** This species has been recorded from WSP surveys within the Indicative disturbance footprint. Suitable habitat identified within the Indicative disturbance footprint.
Pedionomus torquatus	Plains-wanderer	E	CE	BAM-C, PMST, BioNet	The western Riverina of southern NSW is currently considered a stronghold for habitat for Plains-wanderer, with the vast majority (>99%) of records of Plains-wanderer in NSW over the past 30 years coming from the area. Plains-wanderer live in semi-arid, lowland native grasslands that typically occur on hard red-brown soils. Habitat structure appears to play a more important role than plant species composition. Preferred habitat of the Plains-wanderer typically comprises 50% bare ground, 10% fallen litter, and 40% herbs, forbs and grasses.	44, 46	**Recorded.** One individual of the species was recorded 3.16 km west of the intersection of the alignment with Willurah Road. BioNet records have identified individuals of this species within the Indicative disturbance footprint. Additionally, extensive suitable habitat for this species occurs within the Indicative disturbance footprint.

Scientific name	Common name	BC Act[1]	EPBC Act[2]	Source	Habitat description and constraints	Associated PCTs present	Likelihood of occurrence
Pluvialis squatarola	Grey Plover	V	V, M	BioNet	Occurs mainly on coastal mudflats, sandflats and tidal flats, particularly in estuaries, bays and sheltered coastlines. The species forages in intertidal habitats and roosts on adjacent sandy beaches, sandbanks and supratidal areas. In Australia it is a non-breeding migrant, occurring almost exclusively in coastal environments, with limited use of inland wetland.	47	**Low.** While marginal potential habitat for this species is present within the Indicative disturbance footprint, species is primarily coastal and no records occur within the locality.
Polytelis anthopeplus monarchoides	Regent Parrot (eastern)	E	V	BAM-C, PMST, BioNet	The species nests within River Red Gum forests along the Murray, Wakool and lower Murrumbidgee Rivers, and possibly the Darling River downstream of Pooncarie. Typical nest trees are large, mature healthy trees with many spouts (though dead trees are used) and are usually located close to a watercourse.	N/A	**Low.** The Indicative disturbance footprint is not within the known distribution for this species.
Polytelis swainsonii	Superb Parrot	V	V	BAM-C, PMST, BioNet	The Superb Parrot inhabits Box-Gum, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest. In the Riverina the birds nest in the hollows of large trees (dead or alive) mainly in tall riparian River Red Gum Forest or Woodland. On the South West Slopes nest trees can be in open Box-Gum Woodland or isolated paddock trees. Species known to be used are Blakely's Red Gum, Yellow Box, Apple Box and Red Box.	7, 10, 11, 13, 26, 237, 266, 277 & 343.	**Recorded.** This species was recorded in the Inland slopes IBRA sub-region in September and October 2025. BioNet records have identified individuals of this species within the Indicative disturbance footprint. Additionally, suitable habitat for this species occurs within the Indicative disturbance footprint.
Rostratula australis	Australian Painted Snipe	E	E, M	PMST, BioNet, BAM-C	Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber.	7, 10, 11, 13, 17, 24, 47, 53, 160.	**Moderate** Vegetation communities associated within this species are present within the Indicative disturbance footprint, however, this species is not a frequent visitor to the region and although has not been recorded within the locality, if individuals were to occur, it would be a rare sighting. However given the associated habitat and the species' migratory movements, a precautionary approach has determined a moderate likelihood of occurrence. .
Stagonopleura guttata	Diamond Firetail	V	V	PMST, BAM-C, BioNet	Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum (Eucalyptus pauciflora) Woodlands. Also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities.	7, 10, 11, 13, 20, 23, 26, 28, 44, 45, 46, 58, 86, 170, 237, 266, 277, 319 & 343.	**High.** Previously recorded in Indicative disturbance footprint (BioNet record). Extensive potential habitat within Indicative disturbance footprint.
Tringa nebularia	Common Greenshank	E	E, M	PMST, BioNet	Occurs in a range of inland and coastal environments. Inland, it occurs in both permanent and temporary wetlands, billabongs, swamps, lakes floodplains, sewage farms, saltworks ponds, flooded irrigated crops. On the coast, it occurs in sheltered estuaries and bays with extensive mudflats, mangrove swamps, muddy shallows of harbours and lagoons, occasionally rocky tidal ledges. It generally prefers wet and flooded mud and clay rather than sand.	Nil.	**Moderate.** This species has been recorded throughout the locality when conditions are favourable. Although not associated with any present PCTs officially, habitats present may be considered suitable based on this species diverse habitat preferences.

Scientific name	Common name	BC Act[1]	EPBC Act[2]	Source	Habitat description and constraints	Associated PCTs present	Likelihood of occurrence
Mammals							
Chalinolobus dwyeri	Large-eared Pied Bat	V	E	BAM-C	Found mainly in areas with extensive cliffs and caves, from Rockhampton in Queensland south to Bungonia in the NSW Southern Highlands. It is generally rare with a very patchy distribution in NSW. There are scattered records from the New England Tablelands and North West Slopes. Roosts in caves, crevices in cliffs, old mine workings and in disused Fairy Martin mud nests, frequenting low to mid-level elevation dry open forest and woodland close to these features.	Nil	**Low.** No suitable habitat for the species has been identified within the Indicative disturbance footprint.
Dasyurus maculatus	Spotted-tailed Quoll	V	E	PMST, BAM-C	Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Individual animals use hollow-bearing trees, fallen logs, small caves, rock outcrops and rocky-cliff faces as den sites.	266, 277, 343.	**Low.** Although some associated habitats are present within the Indicative disturbance footprint, this species is typically distributed along coastal NSW and near the ranges.
Nyctophilus corbeni	Corben's Long-eared Bat	V	V	PMST, BioNet	Overall, the distribution of the south eastern form coincides approximately with the Murray Darling Basin, with the Pilliga Scrub region being the distinct stronghold for this species. Inhabits a variety of vegetation types, including mallee, bulloke (*Allocasuarina luehmannii*) and box eucalypt dominated communities, but it is distinctly more common in box/ironbark/cypress-pine vegetation that occurs in a north-south belt along the western slopes and plains of NSW and southern Queensland. Roosts in tree hollows, crevices, and under loose bark.	10, 28, 86 & 266.	**Moderate.** This species is associated with numerous PCTs of the Murray Fans IBRA subregion found within the Indicative disturbance footprint. As this species occurs in varied habitat types, the Indicative disturbance footprint is considered suitable.
Petaurus australis	Yellow-bellied Glider	V	V	BAM-C	The Yellow-bellied Glider is found along the eastern coast to the western slopes of the Great Dividing Range, from southern Queensland to Victoria. This species occurs in tall mature eucalypt forests, generally in areas with high rainfall and nutrient rich soils. Forest type preferences vary with latitude and elevation; mixed coastal forests to dry escarpment forests in the north; moist coastal gullies and creek flats to tall montane forests in the south.	266, 277	**Low.** Although vegetation communities associated within this species are present within the Indicative disturbance footprint, this species is not a frequent vagrant to the region and has not been recorded within the locality, if individuals were to occur, they would be a rare vagrant.
Petrogale penicillata	Brush-tailed Rock-wallaby	E	V	BAM-C, BioNet	The range of the Brush-tailed Rock-wallaby extends from south-east Queensland to the Grampians in western Victoria, roughly following the line of the Great Dividing Range. However, the distribution of the species across its original range has declined significantly in the west and south and has become more fragmented. In NSW they occur from the Queensland border in the north to the Shoalhaven in the south, with the population in the Warrumbungle Ranges being the western limit. The species occupies rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges, often facing north.	266, 277.	**Low.** Known distribution is predominantly east of the Indicative disturbance footprint and no suitable habitat in the Indicative disturbance footprint, in the form of rocky areas.
Phascolarctos cinereus	Koala	E	E	BAM-C, PMST, BioNet	Inhabit eucalypt woodlands and forests. Feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area would select preferred browse species. Some preferred species include Forest Red Gum, Grey Gum. In coastal areas, Tallowwood and Swamp Mahogany are important food species, while in inland areas White Box, Bimble Box and River Red Gum are favoured.	7, 10, 11, 13, 15, 17, 20, 23, 24, 26, 28, 53, 58, 86, 157, 159, 160, 170, 216 237, 266, 277, 319, 343, 346.	**Moderate** Potential habitat occurs within the Indicative disturbance footprint.
Pteropus poliocephalus	Grey-headed Flying Fox	V	V	BAM-C, PMST	Typically found within 200 km of the Eastern coast of Australia, from Rockhampton, QLD to Adelaide, SA, but may be found in unusual locations in times of natural resource shortages. Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths, and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy.	266, 277	**Low.** Marginal potential foraging habitat for this species is present on the Indicative disturbance footprint, however, the species was not recorded during field surveys.

Scientific name	Common name	BC Act[1]	EPBC Act[2]	Source	Habitat description and constraints	Associated PCTs present	Likelihood of occurrence
Reptiles							
Aprasia parapulchella	Pink-tailed Worm-lizard	V	V	BAM-C, PMST	Inhabits sloping, open woodland areas with predominantly native grassy ground layers, particularly those dominated by Kangaroo Grass (*Themeda australis*). Commonly found beneath small, partially embedded rocks and appear to spend considerable time in burrows below these rocks. Sites are typically well-drained, with rocky outcrops or scattered, partially buried rocks.	157, 159, 164, 216, 266, 277, 319, 346.	**Low.** A species expert report prepared for the Revised BDAR failed to identify suitable habitat for the species within the Indicative disturbance footprint. Refer to Appendix I of the Revised BDAR for more information.
Delma impar	Striped Legless Lizard	V	V	BAM-C, PMST	Predominantly found in Natural Temperate Grassland and nearby secondary grassland, occasionally in open Box-Gum Woodland, but has also been found in grasslands with a high exotic component. Habitat is where grassland is dominated by perennial, tussock-forming grasses, sometimes with surface rocks or cow pats that can be used for shelter.	277	**Low.** A species expert report prepared for the Revised BDAR failed to identify suitable habitat for the species within the Indicative disturbance footprint. Refer to Appendix I of the Revised BDAR for more information.
Hemiaspis damelii	Grey Snake	E	E	PMST	The Grey Snake has a wide overall range from inland southern NSW to central Queensland. In NSW the species occupies five geographically discrete subpopulations, predominantly associated with the lower reaches of major westerly flowing rivers, including the Gwydir, Namoi, Castlereagh, Macquarie, Lachlan, and Murrumbidgee River systems. In NSW, the Grey Snake's habitat includes the margins of ephemeral wetlands within River Red Gum (*Eucalyptus camaldulensis*) and Black Box (*E. largiflorens*) vegetation communities and Tangled Lignum (*Duma florulenta*) swamps. Heavy clay soils are also a key feature for the species.	7, 10, 11, 13, 15, 17, 24, 46, 47, 53, 160, 166.	**Low**. This species is known to occur within the Riverina region, however, targeted survey effort within suitable habitat types within the Indicative disturbance area failed to identify the species.
Insects							
Keyacris scurra	Key's Matchstick Grasshopper	E	E	PMST	Typically recorded in native grasslands and grassy woodland but it has also been recorded in other vegetation associations usually containing a native grass understory (especially *Themeda triandra*) and known food plants (particularly Asteraceae).	266, 277	**Low.** A species expert report prepared for the HumeLink Revised BDAR failed to identify suitable habitat for the species within the Indicative disturbance footprint. Refer to Appendix I of the Revised BDAR for more information.
Synemon plana	Golden Sun Moth	V	V	PMST	Historically the distribution of Golden Sun Moth extended from central NSW, through to central and western VIC, and into eastern SA. Now, the NSW populations of the species are found between Queanbeyan, Gunning, Young, and Tumut. Occurs in Natural Temperate Grasslands and grassy Box-Gum Woodlands in which ground layer is dominated by wallaby grasses *Austrodanthonia* spp.	266, 277	**Low.** A species expert report prepared for the HumeLink Revised BDAR failed to identify suitable habitat for the species within the Indicative disturbance footprint. Refer to Appendix I of the Revised BDAR for more information.

(1) Indicates a species is listed V = Vulnerable, E = Endangered, or CE = Critically Endangered under the Biodiversity Conservation Act 2016.

(2) Indicates a species is listed V = Vulnerable, E = Endangered, CE = Critically Endangered, M = Migratory under the Environmental Protection and Biodiversity Conservation Act 1999 (*EPBC Act*). The controlling provision for the EPBC referral is listed threatened species and ecological communities. Therefore, where a listed threatened species is also identified as migratory, it has only been considered under the threatened species status i.e., Endangered.

A4. Threatened aquatic species

Below is the likelihood of occurrence for associated aquatic species identified through appropriate database searches. Refer to Appendix M – Aquatic Assessment for the significant impact assessments of the species below.

Scientific name	Common name	EPBC Act[1]	FM Act[2]	Source	Habitat description	Associated PCTs present	Likelihood of occurrence
Bidyanus bidyanus	Silver Perch	E	V	PMST	This species exists in the primarily within the northern and southern extent of the Murray-Darling Basin, with smaller population scattered in between. Silver Perch inhabit free-flowing riverine environments containing clear water. Silver Perch displays no preference for instream microhabitats (i.e. woody debris, instream rocks, riparian vegetation types) and can be found reaches that contain limited instream habitat features (Department of Climate Change, Energy, the Environment and Water, 2024a)	–	**High.** Previously recorded near the amended project footprint (ALA, 2025)
Craterocephalus fluviatilis	Murray Hardyhead	E	CE	PMST	This species is endemic to the mid and lower Murray-Darling River system in south-eastern Australia. They are commonly found in open water habitats, particularly in highly saline wetlands, floodplains and lakes (Fishes of Australia, 2025). During the dry season Murray Hardyhead are confined to isolated waterbodies and floodplains. For their reproductive success, Murray Hardyhead depend on eel grass, which they deposit their eggs when they spawn (Fishes of Australia, 2025).	–	**Moderate.** The amended project footprint intersects with key fish habitat for this species; however, the known populations of this species do not occur in NSW.
Euastacus armatus	Murray Spiny Crayfish	V	V	PMST	This species has a large range which includes Murray and Murrumbidgee Rivers as well as many of their tributaries. Murray Spiny Crayfish habitat includes cool, fast-flowing water containing deep pools, boulder-rich streambeds, and areas with extensive riparian vegetation (Atlas of Living Australia, 2025).	–	**Moderate** The amended project footprint intersects with key fish habitat for this species
Galaxias rostratus	Flathead Galaxias	CE	CE	PMST	This species exists in the southern half of the Murray-Darling Basin system in various habitats such as billabongs, lakes, swamps and rivers, with a preference for still or slow flowing waters (Threatened Species Scientific Committee, 2016) Flathead Galaxias habitat prefer habitats containing coarse sand or mud substrate and aquatic vegetation (NSW Department of Primary Industries, 2014).	–	**Moderate.** The amended project footprint with key fish habitat for this species, however, there have been no records since 1995.
Maccullochella macquariensis	Trout Cod	E	E	PMST	Only one known "natural" breeding population of Trout Cod are known to occur within NSW, which is downstream of the Yarrawonga Weir between Yarrawonga and Barmah (Trout Cod Recovery Team, 2008). This species is known to inhabit deeper rivers that contain a high surface velocity which contain large quantities of woody debris (Trout Cod Recovery Team, 2008).	–	**Moderate.** Potential for stocked fish to inhabit the larger watercourses within the amended project footprint.
Maccullochella peelii	Murray Cod	V	–	PMST	Murray Cod inhabit all major catchments within the Murray-Darling Basin that contain warmer waters. Murray Cod prefer habitats that contain large rocks, woody debris and undercut banks with overhanging vegetation (Fishes of Australia, 2025).	–	**High.** Previously recorded near the amended project footprint (ALA, 2025).
Macquaria australasica	Macquarie Perch	E	E	PMST	This species is primarily located within the upstream reaches of the Murray-Darling Basin including Lachlan, Murrumbidgee and Murray rivers, and parts of south-eastern coastal NSW. Macquarie Perch prefer habitats with copious cover including aquatic vegetation, woody debris, boulders and overhanging banks (NSW Department of Primary Industries and Regional Development, 2025).	–	**Low.** Outside known range.
Mogurnda adspersa (Murray-Darling Basin population)	Southern Purple Spotted Gudgeon (Murray-Darling Basin population)	E	E	PMST	The Southern Purple Spotted Gudgeon occurs in the Murray-Darling basin as well as parts of coastal northern NSW and Queensland. The western population of the Southern Purple Spotted Gudgeon was previously widespread in the Murray, Murrumbidgee and Lachlan River systems and tributaries of the Darling, but has experienced a significant decline in recent times. They are now considered to be rare in inland NSW. The species can be found in a variety of habitats such as rivers, creeks, watercourse and billabongs with slow-flowing or still waters. Cover in the form of aquatic vegetation, overhanging vegetation from riverbanks, leaf litter, rocks or snags are important for the species. (Department of Climate Change, Energy, the Environment and Water, 2026)	–	**Low.** Outside known range – no known records within 10 km of the amended footprint (ALA, 2026)

Scientific name	Common name	EPBC Act[1]	FM Act[2]	Source	Habitat description	Associated PCTs present	Likelihood of occurrence
Nannoperca australis (Murray-Darling Basin lineage)	Southern Pygmy Perch (Murray-Darling Basin lineage)	V	E	PMST	Southern Pygmy Perch prefer habitats in low-gradient waterways and floodplains. It is found in watercourses with slow flowing or still water and aquatic macrophyte cover or wood at shallow depths, which may have little or no flow in summer. This species can tolerate high temperatures and low dissolved oxygen, but lacks salinity tolerance (Threatened Species Scientific Committee, 2021).	–	**Low.** No known records within 10 km of the amended footprint (ALA, 2026)

(1) Indicates a species is listed V = Vulnerable, E = Endangered, CE = Critically Endangered, M = Migratory under the Environmental Protection and Biodiversity Conservation Act 1999 (*EPBC Act*). The controlling provision for the EPBC referral is listed threatened species and ecological communities. Therefore, where a listed threatened species is also identified as migratory, it has only been considered under the threatened species status i.e., Endangered.

(2) Indicates a species is listed V = Vulnerable, EN = Endangered or CE = Critically Endangered under the Fisheries Management Act 1994 (NSW) (*FM Act*).

Attachment B

Significance impact assessment

B1. Significant impact assessment

The Significant Impact Guidelines 1.1 provide definitions for specific terms used throughout the significant impact assessment criteria contained in the Significant Impact Guidelines 1.1 as follows:

- population of a species
- important population
- habitat critical to the survival of a species or ecological community
- ecologically significant proportion (migratory species)
- invasive species.

These definitions are key considerations when conducting a significant impact assessment for threatened and migratory species listed under the EPBC Act. The definition for each is presented below.

B1.1 Population of a species

A 'population of a species' is defined under the EPBC Act as an occurrence of the species in a particular area. In relation to critically endangered, endangered or vulnerable threatened species, occurrences include but are not limited to:

- a geographically distinct regional population, or collection of local populations, or
- a population, or collection of local populations, that occurs within a particular bioregion.

B1.2 Important population

An '*important population*' is defined by the Significant Impact Guidelines as" a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:

- key source populations either for breeding or dispersal
- populations that are necessary for maintaining genetic diversity, and/or
- populations that are near the limit of the species range."

B1.3 Habitat critical to the survival of a species or ecological community

'*Habitat critical to the survival of a species*' is defined by the Significant Impact Guidelines as habitat critical to the survival of a species or ecological community' refers to areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal
- for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)
- to maintain genetic diversity and long-term evolutionary development, or
- for the reintroduction of populations or recovery of the species or ecological community.

Such habitat may be, but is not limited to:

- habitat identified in a recovery plan for the species or ecological community as habitat critical for that species or ecological community; and/or
- habitat listed on the Register of Critical Habitat maintained by the minister under the EPBC Act.

Critical habitat can be further explained as an identified area of viable habitat that contains habitat attributes that are essential for the conservation of a threatened species. These areas are typically under a regime of special protection and management to ensure the critical habitat remains a stronghold for the species to ensure its long-term survival and viability in the wild. Critical habitat may also include an area of land not currently occupied by the species but can act as a sanctuary by possessing the necessary whole of life cycle habitat attributes to facilitate the recovery of a declining population of the species.

B1.4 Invasive species

An *'invasive species'* is an introduced species, including an introduced (translocated) native species, which out-competes native species for space and resources or which is a predator of native species. Introducing an invasive species into an area may result in that species becoming established. An invasive species may harm listed threatened species or ecological communities by direct competition, modification of habitat or predation.

B1.5 Project-specific definitions

In addition to the definitions provided in the Significant Impact Guidelines 1.1, the following project-specific definition has been adopted for the purposes of this significant impact assessment.

B1.5.1 Project

For the purposes of this assessment, the Proposed Action is referred to as the amended project throughout the Significant Impact Assessments and is as described in section 2.1 of this appendix.

B1.5.2 Local area

For the purposes of this assessment, the "local area" refers to the area within a 10 km buffer of the Indicative disturbance footprint. This area has been used to characterise the availability and extent of habitat for listed threatened species and ecological communities in the vicinity of the amended project and to provide context for assessing potential impacts at a local scale. The use of the term "local area" is not intended to replace or reinterpret definitions contained in the Significant Impact Guidelines 1.1, but to support the project-specific application of those definitions in this assessment.

B2. Threatened ecological communities

The amended project is likely to have an impact on six communities recorded within the Indicative disturbance footprint. Assessment of significance have been undertaken for these TECs in accordance with the Significant Impact Guidelines 1.1 (DoE, 2013a).

Table B.1 TECs impacted by the amended project and significant impact assessment outcomes

TEC name	EPBC Act	Area impacted (ha)	Significant impact?
The Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions	E	2.03	No
Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	E	0.59	No
Natural Grasslands of the Murray Valley Plains	CE	81.05	Yes
Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains	CE	0.19	No
Weeping Myall Woodlands	E	77.77	Yes
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	CE	2.69	No

B2.1 The Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions

The Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions (hereafter referred to as Buloke Woodlands) is listed as an endangered ecological community under the EPBC Act.

B2.1.1 Description

The threatened ecological community occurs within two IBRA bioregions, distributed widely across each bioregion as tracts or patches. Clayey and alkaline sub-soils are a common feature of the Buloke Woodlands TEC. The ecological community is characterized as woodland or open woodland with a well-developed ground stratum consisting of grass, shrubs and herbs. Buloke is common to all variants, but *Callitris gracilis* (Slender Cypress-pine) and *Eucalyptus macrocarpa* (Grey Box) may be structurally dominant in some locations. This is due to ongoing disturbance events, introduced plant species are frequently abundant, including *Lolium rigidum* (Wimmera rye grass), *Chondrilla juncea* (Skeleton weed) and *Lepidium africanum* (Common Pepper-cress).

B2.1.2 Relevant commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

A summary of the relevant Commonwealth guidelines and policy statements available for this species is as follows:

- Conservation Advice: "Approved Conservation Advice for the Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions" (DSEWPC, 2023).
- Listing Advice: "Commonwealth Listing Advice on Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions" (DSEWPC, 2000).

- Recovery Plan: “National recovery plan for the Buloke Woodlands of the Riverina and Murray Darling Depression Bioregions”. (Department of Sustainability and Environment 2011). In effect under the EPBC Act from 12-Feb-2012.
- Threat Abatement Plan: “Threat abatement plan for competition and land degradation by rabbits” (DSEWPC, 2016).

Table B.2 identifies the sections of the Revised BDAR where key information relating to the assessment and management of this species is presented.

Table B.2 Reference to relevant sections of the Revised BDAR for Buloke Woodlands TECs

Relevant sections of the Revised BDAR
TEC Information and assessment – sections 4.2, 6.2.1 and 6.2.2.1
Impacts – sections 9.1.4, 11.1 and Chapter 12
Avoidance and Minimisation Measures – Chapter 8
Figures – Chapter 15

B2.1.3 Specific impacts

The Buloke – Moonah – Black Box open woodland on sandy rises of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (PCT 20) within the Indicative disturbance footprint is considered consistent with the EPBC Act Buloke Woodlands. The community within the Indicative disturbance footprint is considered to be in is highly modified in thinned and derived condition.

The amended project is estimated to impact upon of 2.03 ha of the Buloke Woodlands.

B2.1.4 Significant impact criteria

- *reduce the extent of an ecological community*

The complete extent of Buloke Woodlands is uncertain across the community’s distribution due to extensive degradation and clearing. The amended project would result in the loss of 2.03 ha Buloke Woodlands. Within the Indicative disturbance footprint, this TEC is associated with PCT 20 in thinned and derived conditions. The current extent of PCT 20 is estimated at 1000 ha in the BioNet Vegetation Classification database {NSW DCCEEW, 2026 #4491}. The removal of 2.03 ha for the amended project therefore represents just 0.2% of the remaining extent of this PCT. Given the broader extent of the vegetation, and the small area of the Buloke Woodlands to be removed it is unlikely the loss of 2.03 ha would significantly impact on the remaining extent of the Buloke Woodlands.

- *fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines*

Fragmentation is an ongoing threat to Buloke Woodlands across the extent of the ecological community. This is due to extensive clearing and improper regeneration techniques. The amended project would impact a small area of the Buloke Woodlands, in highly modified (thinned and derived) condition and most of this clearance is likely to occur to a minor extent at the edge of patches. Given the severely fragmented distribution of the Buloke Woodlands, scale and nature of the amended project (i.e. string of the overhead transmission lines and minor clearance for towers and access) it is unlikely the amended project would lead to further fragmentation of the community.

- *adversely affect habitat critical to the survival of an ecological community*

According to the approved conservation advice for the community, habitat most critical to the survival of the TEC includes:

- patches that contain a mature *Allocasuarina luehmannii* trees and have more than 50% vegetative cover of native species in the understorey; or
- areas with less than 50% vegetative cover of native species in the understorey that contain important habitat features for rare, threatened and/or functionally important fauna {Commonwealth DCCEEW, 2023 #4519}. Though other areas of the community may also be considered important, depending on context.

The Buloke Woodlands within the Indicative disturbance footprint contains *Allocasuarina luehmannii* and has native understorey, however cover of native vegetation in these condition states was variable and structural components of the community were often missing – no threatened, rare or important fauna species were recorded using the community during surveys. Given the poor condition of the Buloke Woodlands and the small extent to be removed by the amended project it is unlikely it would represent habitat critical to the survival of the ecological community.

- *modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns*

The amended project would require the removal of up to 2.03 ha of Buloke Woodlands. Construction of the access roads and towers may require some excavation works; however, these are not expected to alter groundwater levels or substantial change surface water drainage patters to an extent that would impact the community's survival. Furthermore, mitigation measures would be implemented during the construction phase and ongoing maintenance to minimise disturbance and reduce surface water impacts (e.g. Controls for sedimentation and hydrological impacts). Therefore, the amended project is considered unlikely to substantially modify or destroy these abiotic factors.

- *cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or*

The amended project does not include regular burning or flora and fauna harvesting or other activities that would substantially change the species composition of the community. Indirect impacts because of shifting of edge effects and weed dispersal may result in a reduction in the quality or integrity on the edge of the remaining areas of the ecological community. Mitigation measures such as weed and pathogen control, controls for sedimentation and hydrological impacts would be put in place to limit indirect impacts of the amended project on the surrounding vegetation. Therefore, it is considered unlikely the amended project would result in the decline or loss of a functionally important species or to substantially change the species composition of the retained vegetation, or to substantially impact fauna occurring within this habitat.

- *cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:*
  - *assisting invasive species, that are harmful to the listed ecological community, to become established*
  - *causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community.*

Given the previous agriculture use there may be some mobilisation of fertilisers chemical or other pollutants as part of any excavation works. However, excavation activities would not be ongoing and mitigation measures would be in place to ensure sedimentation and run-off is managed and minimised.

The condition of the Buloke Woodlands various across the subject and with a number of invasive species already present within the landscape. Mitigation measures including weed and pest management plans, vegetation clearing protocols, installation vehicle wash stations and sediment, and control measures would be implemented, therefore it is unlikely the amended project would result in invasive species that are harmful to the Buloke Woodlands becoming established.

Given the small area to be impacted and nature of the amended project combined with the implementation of mitigation measures it is unlikely that the amended project would substantially reduce the quality or integrity of the Buloke Woodlands.

- *interfere with the recovery of an ecological community*

There is no current recovery plan for Buloke Woodlands, the approved conservation advice for the TECs list a number of conservations action to assist with the recovery of the community, including:

- protection of the ecological community through preventing impacts on native vegetation, fauna, hydrology and soil structure from developments and activities
- minimizing impacts to existing habitat by retaining important habitat features such as mature trees with potential hollows, and
- preventing further weed invasion through a reduction in invasive weed spread and prevention of the spread of feral animals within the regions associated with Buloke Woodlands.

The habitat to be cleared is in thinned and derived condition and does not contain mature trees or hollows. Mitigations will be in place to manage impacts of weeds, sedimentation and edge effects and the resultant impacts are likely to be minor. The amended project would involve clearing of this TEC, however the loss of 2.03 ha of the Buloke Woodlands is unlikely to substantially interfere with the recovery of the Buloke Woodlands.

B2.1.5 Conclusion

Buloke Woodlands within the Indicative disturbance footprint is fragmented and highly modified in thinned and derived condition. The amended project would result in the loss of 2.03 ha of the Buloke Woodlands. Given the highly modified nature of this community within the Indicative disturbance footprint and relatively limited direct impact, it is unlikely the amended project would have a significant residual impact on the Buloke Woodlands community.

B2.2 Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia

*Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia* (hereafter Grey Box Woodlands) is listed as an endangered ecological community under the EPBC Act.

B2.2.1 Description

The Grey Box Woodlands occupies a transitional position between temperate woodlands and forests of the lower sloped and tablelands of south-eastern Australia, and semi-arid communities further inland (DCCEEW, 2012). The community occupies drier sites of grassy woodlands, with a rainfall zone of 375–700 mm/year. A typical canopy within this ecological community is dominated by *Eucalyptus macrocarpa* (grey box), and a sparse shrub layer with a species-rich ground layer of grass and herbs. Within drier parts of the threatened ecological community range, chenopods are often present under the canopy story. Distribution of the ecological community ranges from the Narrabri district in central New South Wales through northern Victoria into South Australia.

B2.2.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

A summary of the relevant Commonwealth guidelines and policy statements available for this community is as follows:

- Conservation Advice: "Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia" (DSEWPC 2010).
- Listing Advice: "Commonwealth Listing Advice on Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia" (DSEWPC 2010).

Table B.3 identifies the sections of the Revised BDAR where key information relating to the assessment and management of this species is presented.

Table B.3 Reference to relevant sections of the Revised BDAR for Grey Box Woodlands TECs

Relevant sections of the Revised BDAR
TEC Information and assessment – sections 4.2, 6.2.1 and 6.2.2.2
Impacts – sections 9.1.4, 11.1 and Chapter 12
Avoidance and Minimisation Measures – Chapter 8
Figures – Chapter 15

B2.2.3 Specific impacts

One associated vegetation type, PCT 237 – Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone was recorded in the Indicative disturbance footprint and is consistent with the EPBC Grey Box Woodlands listing based on condition criteria. The Grey Box Woodlands within the Indicative disturbance footprint is considered to be in moderate to good condition.

The amended project is estimated to impact upon of 0.59 ha of the Grey Box Woodlands.

B2.2.4 Significant impact criteria

- *reduce the extent of an ecological community*

There is a significant gap in the knowledge about the historical and current extent of the Grey Box Woodlands due to limited mapping in parts of the community's larger range. However, the current area of occupancy for the community is estimated at 534,500 ha, as outlined in the approved conservation advice. The amended project is likely to result in the loss 0.59 ha of Grey Box Woodlands, which represents less than 0.0001% of the national extent of the community. Given the scale of the impacts, it is unlikely the amended project would have significantly impact on the remaining extent of the Grey Box Woodlands.

- *fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads*

Grey Box Woodland has a significantly fragmented distribution due to vegetation clearing and other human-induced practices. The amended project would utilise existing tracks and clearings, where possible, to limit the construction of new tracks. Where this is not possible, the design would seek to minimise impacts to native vegetation, including cut and fill, as a priority. The construction of line towers would be micro-sited to further minimise vegetation clearing. The amended project is likely to result in the loss 0.59 ha of Grey Box Woodlands, as such, it is unlikely the amended project would result in substantial fragmentation across the Indicative disturbance footprint.

- *adversely affect habitat critical to the survival of an ecological community*

To date, no critical habitat for the Grey Box Woodland TEC has been specified under the EPBC Act.

'Habitat critical to the survival of an ecological community' refers to areas that are necessary:

- for the long-term maintenance of the ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)
- to maintain genetic diversity and long-term evolutionary development, or
- for the reintroduction of populations or recovery of the ecological community.

Habitat critical has not been defined in the approve conservation advice for the community. While the Grey Box Woodlands is of moderate to good condition, it is unlikely the loss of less than 0.0001% of the national extent of this TEC, would be essential for the maintaining genetic diversity or the long-term maintenance and /or recovery of the community. It is unlikely the amended project would result in an adversely affect habitat critical to the survival of the Grey Box Woodlands.

- *modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns*

The amended project would require the removal of up to 0.59 ha of Grey Box Woodlands. Construction of the access roads and towers may require some excavation works; however, these are not expected to alter groundwater levels or substantial change surface water drainage patters to the extent that would impact the community's survival. Furthermore, mitigation measures would be implemented during the construction phase and ongoing maintenance to minimise disturbance and reduce surface water impacts (e.g. controls for sedimentation and hydrological impacts). It is unlikely the amended project would modify or destroy factors necessary for an ecological community's survival.

- *cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting*

The amended project would require the removal and/or disturbance to 0.59 ha Grey Box Woodlands within areas of existing disturbance. The amended project would require ongoing maintenance under within the string corridor; however, this is expected to be minor in scale and nature and unlikely to result in a change in the species composition of the ecological community. The amended project does not involve regular burning or flora and fauna harvesting. Therefore, the proposed action is considered unlikely to substantially change the species composition of an occurrence of this community.

- *cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:*
  - *assisting invasive species, that are harmful to the listed ecological community, to become established*
  - *causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community.*

Given the previous agriculture use there may be some mobilisation of fertilisers chemical or other pollutants as part of any excavation works. However, excavation activities would not be ongoing and mitigation measures would be in place to ensure sedimentation and run-off is managed and minimised.

The condition of the Grey Box Woodlands various across the subject and with a number of invasive species already present within the landscape. Mitigation measures including weed and pest management plans, vegetation clearing protocols, installation vehicle wash stations and sediment, and control measures would be implemented, therefore it is unlikely the amended project would result in invasive species that are harmful to the Grey Box Woodlands becoming established.

Given the small area to be impacted and nature of the amended project combined with the implementation of mitigation measures it is unlikely that the amended project would substantially reduce the quality or integrity of the Grey Box Woodlands.

- *interfere with the recovery of an ecological community*

No current recovery plan has been established for the Grey Box Woodlands. The approved conservation advice for the community sets out a number of conservation priorities including:

- reducing habitat loss, disturbance and modification through managing threats to remnants of the ecological community and implementing management regimes
- controlling invasive species by managing sites for prevention of further spread and the introduction of landscape-scale control programs
- enabling the recovery of additional sites to maintain and improve the connectivity of remnants.

Given the small scale and nature of the amended project, it is unlikely to loss of 0.59 ha of Grey Box Woodlands would substantially interfere with any of the recovery objectives listed.

B2.2.5 Conclusion

The Indicative disturbance footprint is predicated to remove 0.59 ha of Grey Box Woodlands, which represents less than 0.0001% of the extent of the community nationally. Given the small scale and nature of the impacts it is unlikely the amended project would have a significant residual impact on the Grey Box Woodlands.

B2.3 Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains

Seasonal Herbaceous Wetlands (freshwater) of the Temperate Lowland Plains (hereafter Seasonal Herbaceous Wetlands) is listed as critically endangered ecological community under the EPBC Act.

B2.3.1 Description

This threatened ecological community describes temporary freshwater wetlands which are inundated seasonally before drying out. Structurally, the vegetation is predominantly treeless and dominated by an herbaceous ground layer that consists of species common to wetter locations (DCCEEW, 2012). The Seasonal Herbaceous Wetlands ecological community exhibit the following key diagnostic characteristics:

- a landscape consisting of flat plains grading into slopes and fertile, but poor draining clay soils
- rainfall is the main source of seasonal inundations of water to the ecological community during winter-spring, which dries late summer
- trees and shrubs are sparse to absent, mainly occurring as fringing or scattered individuals. At least one native wetland forb species must be present after inundation of the community with water, however a range of forbs can be found within the locality.

B2.3.2 Relevant commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

A summary of the relevant Commonwealth guidelines and policy statements available for this threatened ecological community is as follows:

- Conservation Advice: “Approved Conservation Advice for the Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains.” (DSEWPC 2012). In effect under the EPBC Act from 27-Mar-2012.
- Listing Advice: “Commonwealth Listing Advice on Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains” (DSEWPC 2012).

Table B.4 identifies the sections of the Revised BDAR where key information relating to the assessment and management of this species is presented.

Table B.4 Reference to relevant sections of the Revised BDAR for Seasonal Herbaceous Wetlands TEC

Relevant sections of the Revised BDAR
TEC Information and assessment – sections 4.2, 6.2.1 and 6.2.2.5
Impacts – sections 9.1.4, 11.1 and Chapter 12
Avoidance and Minimisation Measures – Chapter 8
Figures – Chapter 15

B2.3.3 Specific impacts

The Swamp grassland wetland of the Riverine Plain- PCT 47 (Mod-good condition) is considered consistent with the EPBC Act Seasonal Herbaceous Wetlands listing. The amended project is estimated to impact upon of 0.19 ha of Seasonal Herbaceous Wetlands.

B2.3.4 Significant impact criteria

- *reduce the extent of an ecological community*

The list advice for the Seasonal Herbaceous Wetlands notes that the area of occupancy is approximately 30,000 ha. The amended project would result in the loss of 0.19 ha of Seasonal Herbaceous Wetlands, which represents 0.0006% of the community's occurrence. This reduction is unlikely to have any significant impact on the survival of the ecological community.

- *fragment or increase fragmentation of an ecological community*

The amended project involves the installation of a new transmission line including the construction of towers and stringing of the transmission line. The Seasonal Herbaceous Wetlands occurs in the landscape as small and naturally fragmented patches and most impact is likely to occur at the edge of habitat patches or involve removal of patches. Given the nature and small scale of the impact, it is unlikely the amended project would result in any substantial fragmentation of the community within the Indicative disturbance footprint.

- *adversely affect habitat critical to the survival of an ecological community*

The listing advice for Seasonal Herbaceous Wetlands (DSEWPC 2012) does not map or describe any habitats or areas critical to the survival of this community.

'Habitat critical to the survival of an ecological community' refers to areas that are necessary:

- for the long-term maintenance of the ecological community (including the maintenance of species essential to the survival of the ecological community, such as pollinators)
- to maintain genetic diversity and long-term evolutionary development, or
- for the reintroduction of populations or recovery of the ecological community.

Seasonal Herbaceous Wetlands recorded within the Indicative disturbance footprint occurs as fragmented patches. These patches are in a disturbed condition, do not occur as unique assemblages or at the edge of the range of the community and are small in size. Based on this, it is unlikely that these patches would be important for genetic diversity, reintroduction, recovery or long-term survival. The amended project would not adversely impact habitat critical to the survival of the Seasonal Herbaceous Wetlands.

- *modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns*

The amended project would require the removal of up to 0.19 ha of Seasonal Herbaceous Wetlands. Construction of the towers may require some excavation works; however, these are not expected to alter groundwater levels or substantial change surface water drainage patters to an extent that would impact the community's survival. Furthermore, mitigation measures would be implemented during the construction phase and ongoing maintenance to minimise disturbance and reduce surface water impacts (e.g. Controls for sedimentation and hydrological impacts).

- *cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or*

The amended project does not include regular burning or flora and fauna harvesting or other activities that would substantially change the species composition of the community.

Indirect impacts because of shifting of edge effects and weed dispersal may result in a reduction in the quality or integrity on the edge of the remaining areas of the ecological community. Mitigation measures such as weed and pathogen control, controls for sedimentation and hydrological impacts would be put in place to limit indirect impacts of the amended project on the surrounding vegetation. Therefore, it is considered unlikely the amended project would result in the decline

or loss of a functionally important species or to substantially change the species composition of the retained vegetation, or to substantially impact fauna occurring within this habitat.

- *cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:*
  - *assisting invasive species, that are harmful to the listed ecological community, to become established*
  - *causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community.*

Seasonal Herbaceous Wetlands within the Indicative disturbance footprint are currently subject to weed and pest invasion, reflecting the threat of invasive weeds across the whole distribution.

There is potential for the mobilisation of fertilisers, herbicides or other chemicals or pollutants to impact on the remaining area of the ecological community during excavation activities. The amended project includes mitigation measures to minimise sedimentation and hydrological impacts (water-sensitive urban design) to minimise potential indirect impacts resulting from altered soil or drainage patterns would be implemented.

It is considered, that with the implementation of the mitigation measures, the amended project is unlikely to substantially reduce the quality or integrity of the community's occurrence or significantly increase the spread of invasive species.

- *interfere with the recovery of an ecological community*

To date, no recovery plan has been developed by the Department of Climate Change, Energy, the Environment and Water (DCCEEW) A for the Seasonal Herbaceous Wetlands. The approved conservation advice for the Seasonal Herbaceous Wetlands includes a number of priority actions, including:

- ensure that development activities minimise direct impacts to the ecological community and indirect effects on its ecological function
- avoid clearance of native vegetation within the ecological community and its surrounds to reduce the threat of habitat loss, disturbance and modification. Ensuring networks of wetlands serving as linkages for wildlife and their habitat is maintained must also be considered
- prevent and manage any changes to hydrology that may result in changes to natural patterns of inundation and overland flows, water table levels, salinity, algal blooms, sedimentation/turbidity or pollution
- mitigate impacts from weed invasions through eradicating or managing weed infestations within the ecological community using appropriate methods, especially at wetlands where new weed incursions are establishing.

The amended project would result in the loss of 0.19 ha of Seasonal Herbaceous Wetlands. Whilst this is inconsistent with the priority actions regarding community removal and clearance, it is unlikely to result in fragmentation or impact the hydrology within the Indicative disturbance footprint. In addition, mitigation measure such as hygiene controls would be implemented to minimise invasive species and other indirect impacts. Therefore, it is unlikely the amended project would substantially interfere with the recovery of the Seasonal Herbaceous Wetlands.

B2.3.5 Conclusion

The amended project would lead to a direct impact of 0.19 ha of Seasonal Herbaceous Wetlands. Based on the assessment above it is unlikely the amended project would result in a significant residual impact on the Seasonal Herbaceous Wetlands.

B2.4 Weeping Myall Woodlands

Weeping Myall Woodland is an endangered ecological community listed under the EPBC Act.

B2.4.1 Description

Weeping Myall Woodlands ranges from an open woodland to woodland, generally four to 12 m high. The overstorey is dominated by Weeping Myall (*Acacia pendula*) trees and in some cases this species may be the only tree canopy species. Weeping Myall Woodlands typically occurs on textured red or brown alluvial soils that received approximately 375–500 mm mean annual rainfall.

This community occurs as scattered remnants within the alluvial plains of the Murray-Darling River system within the Local Government Areas of Berrigan, Bland, Bogan, Carrathool, Conargo, Coolamon, Coonamble, Corowa, Forbes, Gilgandra, Griffith, Gwydir, Inverell, Jerilderee, Lachlan, Leeton, Lockhart, Moree Plains, Murray, Murrumbidgee, Narrabri, Narranderra, Narromine, Parkes, Urana, Wagga Wagga and Warren.

B2.4.2 Relevant commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

A summary of the relevant Commonwealth guidelines and policy statements available for this TEC is as follows:

- Conservation advice: "Approved Conservation Advice for Weeping Myall Woodlands ecological community" (Department of the Environment, Water, Heritage and the Arts 2008). In effect under the EPBC Act from 07-Jan-2009.
- Listing advice: “Commonwealth Listing Advice on Weeping Myall Woodlands” (TSSC 2009). In effect under the EPBC Act from 07-Jan-2009.
- Threat abatement plans: “Threat abatement plan for the biological effects, including lethal toxic ingestion, caused by cane toads”. In effect under the EPBC Act from 06-Jul-2011. {Department of Sustainability Environment Water Population and Communities, 2011 #4166}

Table B.5 identifies the sections of the Revised BDAR where key information relating to the assessment and management of this species is presented.

Table B.5 Reference to relevant sections of the Revised BDAR for Weeping Myall Woodlands TEC

Relevant sections of the Revised BDAR
TEC Information and assessment – sections 4.2, 6.2.1 and 6.2.2.6
Impacts – sections 9.1.4, 11.1 and Chapter 12
Avoidance and Minimisation Measures – Chapter 8
Figures – Chapter 15

B2.4.3 Specific impacts

Plant community type 26 (Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion) is the only PCT recorded in the Indicative disturbance footprint that meets the EPBC Act Weeping Myall Woodland listing criteria. The Weeping Myall Woodlands was considered to be in moderate to good condition. The amended project is estimated to impact upon of 77.77 ha of the Weeping Myall Woodland.

B2.4.4 Significant impact criteria

An action is likely to have a significant impact on an endangered ecological community if there is a real chance or possibility that it will:

- *reduce the extent of an ecological community*

This community occurs in the northeastern section of the amended project corridor from Dinawan substation to slightly east of Carathool Road. The amended project would result in a reduction of the extent of the Weeping Myall Woodland through the direct clearing of vegetation associated with this TEC. Approximately 77.77 ha of this Weeping Myall Woodlands would be impacted by the amended project. The current extent of the community is estimated to be between 220,000 ha to 361,000 ha, as outlined in the listing advice. The removal of 77.77 ha for this project therefore represents between 0.02% and 0.04% of the remaining extent of the community. This potential impact is considered to reduce the extent of the community within the region; however, this reduction is unlikely to significantly impact the remaining extent of the Weeping Myall Woodlands, more broadly.

- *fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines*

The amended project involves the installation of a new transmission line and would require the removal and/or disturbance to 77.77 ha Weeping Myall Woodland within areas of existing disturbance. Weeping Myall Woodland generally occurs within a fragmented landscape, caused by impacts such as agriculture. However, the amended project is linear infrastructure and TEC impacts will intersect larger patches of this woodland within the landscape. Consequently, the amended project would increase fragmentation of Weeping Myall Woodland.

- *adversely affect habitat critical to the survival of an ecological community*

No critical habitat has been listed for the Weeping Myall Woodland ecological community under the *Environment Protection and Biodiversity Conservation Act 1999* (Department of Agriculture, Water and the Environment (2020).

Habitat critical to the survival of ecological communities also refers to areas that are necessary:

- for the long-term maintenance of the ecological community (including the maintenance of species essential to the survival of the ecological community, such as pollinators)
- to maintain genetic diversity and long-term evolutionary development, or
- for the reintroduction of populations or recovery of the ecological community.

Weeping Myall Woodland recorded within the Indicative disturbance footprint occurs as patches of woodland in varied condition and often fragmented within the broader landscape. It is possible these patches represent habitat critical for the community as patches generally met minimum condition criteria including presence of native understorey, some patches are large and had more than two layers, noting that most patches had some level of dieback.

- *modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns*

The amended project would require the removal of up to 77.77 ha of Weeping Myall Woodland. Any large-scale excavation that occurs in close proximity to Weeping Myall Woodland or to marginal patches would involve mitigation measures to minimise sedimentation and hydrological impacts. Therefore, the amended project is considered unlikely to substantially modify or destroy these abiotic factors.

- *cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting*

The amended project would require the removal and/or disturbance to 77.77 ha Weeping Myall Woodland within areas of existing disturbance. Furthermore, Weeping Myall Woodland generally occurs in a highly modified condition as a result of existing disturbance practices in the area. This has resulted in the modification of the communities structurally integrity i.e. absence of one or more strata. Any further modifications are unlikely to cause a community to no longer meet condition thresholds. Therefore, the amended project is considered unlikely to substantially change the species composition of an occurrence of this community.

- *will the action cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:*
  - *assisting invasive species, that are harmful to the listed ecological community, to become established*
  - *causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community.*

Weeping Myall Woodland within the Indicative disturbance footprint is currently subject to weed and pest invasion. Furthermore, the majority of the amended project occurs within previously disturbed land. Therefore, it is considered unlikely that the amended project would substantially reduce the quality or integrity of the community's occurrence or significantly increase the spread of invasive species.

Mitigation measures are recommended in the EIS to minimise the likelihood of spread of weeds, or pathogens into the site and as well as sedimentation and hydrological impacts.

- *interfere with the recovery of an ecological community*

To date, no recovery plan has been developed by the Department of Climate Change, Energy, the Environment and Water (DCCEEW) for Weeping Myall Woodlands. The approved conservation advice for Weeping Myall Woodlands outlines recovery and threat abatement actions including:

- protecting remnants of the listed ecological community through the development of conservation agreements and covenants
- the use of strategic grazing that allows regeneration
- replanting of understorey species where they have been depleted
- use of lopping methods that do not result in the death of the dominant tree species
- avoiding the application of fertilisers and herbicides in or near remnants
- protecting remnants from weeds including the speedy eradication of any new invasions; and
- raising awareness of the ecological community within the community.

The amended project would result in clearing 77.77 ha of this Community and therefore would interfere with the first action (protection of remnants).

B2.4.5 Conclusion

This community occurs in the northeastern section of the amended project from Dinawan substation to slightly east of Carathool Road. Vegetation occurs in various condition states including intact woodland. The amended project would clear 77.77 ha of this community and is likely to fragment this community and reduce the extent within the locality. Where possible the clearing of this community would be avoided, and mitigation measures would be recommended in the amended project such as weed control to reduce impacts.

However, despite these mitigation measures, the amended project is expected to result in a reduction in the extent of this TEC within the locality and may marginally increase fragmentation at the local scale which would interfere with the recovery of the community. Therefore, the amended project is likely to have a significant residual impact on Weeping Myall Woodland.

B2.5 White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland

White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (hereafter Box-gum Woodland) is a Critically Endangered Ecological Community listed under the EPBC Act.

B2.5.1 Description

The Box-gum Woodland TEC is broad distributed in an arc along the western slopes and tablelands of the Great Dividing Range from Southern Queensland through NSW and ACT, to Victoria. The community is known to occur on hilly to undulating landscaped in area with soils of moderate fertility; occurring in areas where the average rainfall is between 400 and 900 mm per year (DEECCWW, 2011). The structure of the ecological community varies across the distribution, with the tree cover and shrub density varying substantially. Characteristic understory includes scattered to sparse shrubs with a diverse ground layer mix of grasses and herbs. Species including *Eucalyptus albens* (white box), *E. melliodora* (yellow box) and *E. blakelyi* (Blakely's red gum) are dominant. Shrub cover is usually scattered, with possible dominant patches in some localities. The most plant species richness is found within the ground layer, with a dominance of tussock grasses being a key feature.

B2.5.2 Relevant commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

A summary of the relevant Commonwealth guidelines and policy statements available for this Threatened Ecological Community is as follows:

- Conservation advice: "Approved Conservation Advice for the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland" (Department of the Environment, Water, Heritage and the Arts 2008). In effect under the EPBC Act from 31-Aug-2023.
- Listing advice: "Commonwealth Listing Advice on White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland" (TSSC 2006). In effect under the EPBC Act from 18-May-2006.
- National Recovery Plan for White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland {Department of Environment Climate Change and Water, 2011 #3202}. In effect under the EPBC Act from 22-Mar-2013.
- Threat abatement plans:
  - "Threat abatement plan for the biological effects, including lethal toxic ingestion, caused by cane toads" {Department of Sustainability Environment Water Population and Communities, 2011 #4166}. In effect under the EPBC Act from 06-Jul-2011.
  - "Threat abatement plan for predation, habitat degradation, competition and disease transmission by feral pigs *(Sus scrofa)"* {Department of the Environment and Energy, 2017 #3444}. In effect under the EPBC Act from 18-Mar-2017.
  - "Threat abatement plan for disease in natural ecosystems caused by *Phytophthora cinnamomi"* {The Department of the Environment and Energy, 2017 #3531}. In effect under the EPBC Act from 22-Feb-2019.

Table B.6 identifies the sections of the Revised BDAR where key information relating to the assessment and management of this species is presented.

Table B.6 Reference to relevant sections of the Revised BDAR for Box-gum woodlands TEC

Relevant sections of the Revised BDAR
TEC Information and assessment – sections 4.2, 6.2.1 and 6.2.2.7
Impacts – sections 9.1.4, 11.1 and Chapter 12
Avoidance and Minimisation Measures – Chapter 8
Figures – Chapter 15

B2.5.3 Specific impacts

The following vegetation types recorded within the Indicative disturbance footprint were considered consistent with the EPBC Act Box-gum Woodland listing:

- PCT 266 – White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
- PCT 277 – *Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion.*

The amended project is estimated to impact upon of 2.69 ha of the Box-gum Woodland, within the Indicative disturbance footprint in moderate-good and derived conditions.

B2.5.4 Significant impact criteria

- *reduce the extent of an ecological community*

The Box-gum Woodland is broadly distributed in an arc along the western slopes and tablelands of the Great Dividing Range from Southern Queensland through NSW and ACT, to Victoria. The Box-gum within the Indicative disturbance footprint also occurs in fragmented patches.

In NSW an estimated 250,729 ha of the community is thought to remain, which equates to only seven percent of the estimated pre-1970 area (3,717,366 ha), and nationally 416,325 hectares is thought to remain (8% of the pre-1750 area. The removal of this community associated with the Indicative disturbance footprint would represent 0.001% of the estimated extent of the remaining community within NSW (Threatened Species Scientific Committee 2006), and 0.0007% of the estimated extent nationally.

The loss of 2.69 ha associated with the amended project is unlikely to significantly reduce the extent of this threatened ecological community.

- *fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines*

This ecological community is known to be highly fragmented, with the remaining extent being distributed in small, isolated patches. The amended project involves construction of a transmission line across 2.69 ha of Box-Gum Grassy Woodland. However, mitigation measures would be implemented to minimise impacts to the TEC including prioritizing existing tracks access, and clearing being restricted to the identified tower. Most of the amended project clearing will occur over small, isolated remnants or at the edge of woodland patches. While the impact will marginally decrease the extent of the community within the broader landscape, it is unlikely that the loss of this 2.69 ha would significantly increase fragmentation of the Box-Gum Grassy Woodland.

- *adversely affect habitat critical to the survival of an ecological community*

The approved conservation advice for the Box-gum Woodland states that 'Given the currently highly fragmented and degraded state of this ecological community, all areas of Box-Gum Grassy Woodland which meet the minimum condition criteria should be considered critical to the survival of this ecological community.'

The amended project is likely to impact on habitat critical to the survival of the community. Nevertheless, the amended project would impact only a very small portion of the Box-gum Woodland representing 0.0007% of the community nationally.

- *modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns*

The amended project would require the removal of up to 2.69 ha of Box-gum Woodland. Construction of the towers may require some excavation works; however, these are not expected to alter groundwater levels or substantial change surface water drainage patters to an extent that would impact the community's survival. Mitigation measures would be implemented during the construction phase and ongoing maintenance to minimise disturbance and reduce surface water impacts (e.g. controls for sedimentation and hydrological impacts).

- *cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or*

The amended project does not include regular burning or flora and fauna harvesting or other activities that would substantially change the species composition of the community. Indirect impacts as a result of shifting of edge effects and weed dispersal may result in a reduction in the quality or integrity on the edge of the retained areas of the ecological community. Mitigation measures would be implemented to minimise sedimentation and hydrological impacts during construction and bushfire management plans would be in place in accordance with the regulatory requirements for the amended project. It is unlikely the amended project would result in the decline or loss of a functionally important species or to substantially change the species composition of the community.

- *cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:*
  - *assisting invasive species, that are harmful to the listed ecological community, to become established*
  - *causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community.*

There is potential for the mobilisation of fertilisers, herbicides or other chemicals or pollutants to impact on the remaining area of the ecological community. The amended project includes mitigation measures to minimise sedimentation and hydrological impacts (water-sensitive urban design) to minimise potential indirect impacts resulting from altered soil or drainage patterns would be implemented. It is considered, that with the implementation of the mitigation measures, the amended project is unlikely to substantially reduce the quality or integrity of the community's occurrence or significantly increase the spread of invasive species.

- *interfere with the recovery of an ecological community*

The National Recovery Plan for Box-Gum Woodlands (Department of Environment Climate Change and Water 2010) outlines the following recovery actions:

- establish agreed protocols across jurisdictions for the assessment of Box-gum woodland condition in Year 1 of the recovery plan implementation and apply these on an ongoing basis
- share data and reporting between jurisdictions, government, and nongovernment agencies
- investigate the occurrence of Box-gum woodland in South Australia

- collate existing survey and mapping data relating to Box-gum woodland into a central, updatable repository for use by stakeholder government agencies in mapping extent, protected areas, and priority areas. Update repository on an annual basis
- identify gaps in survey and mapping data across the predicted distribution of Box-gum woodland and engage communities and conduct future surveys to fill these gaps
- investigate the further use of remote sensing and other assessment techniques
- establish and apply protocols for non-technical monitoring of remnant areas
- identify gaps in current monitoring to ensure the geographic range and ecological variation within the ecological community is represented, and to coordinate implementation and analysis of all monitoring
- improve baseline knowledge of condition and generate benchmark data against which sites can be assessed for management actions and cost effectiveness of revegetation ranked.

The amended project is unlikely to interfere with any of the recovery actions outlined.

B2.5.5 Conclusion

The Indicative disturbance footprint has been previously disturbed and is subjected to ongoing grazing pressure, which is evident in the moderate to poor condition of the Box-gum woodland. The amended project would result in the loss of 2.69 ha Box-gum Woodland. This represents would represent 0.001% of the estimated extent of the remaining community within NSW (Threatened Species Scientific Committee 2006), and 0.0007% of the estimated extent nationally (416,325 ha).

It is considered unlikely that the amended project would have a significant residual impact on the long-term persistence of the community.

B2.6 Natural Grasslands of the Murray Valley Plains

Natural Grasslands of the Murray Valley Plains threatened ecological community (hereafter Murray Valley Grasslands) is listed as a critically endangered ecological community under the EPBC Act.

B2.6.1 Description

The Murray Valley Grasslands occurs predominately across the southern parts of the Riverina bioregion and extends into parts of the Murray Darling Depression and NSW South-Western Slopes bioregions. This landscape consists of a mosaic of woodlands interspersed with grasslands, wherever soil textures are heavier and less well-drained, and ephemeral or seasonal wetlands on depressions and drainage lines (DSE, 2010).

The community is characterised by:

- grey self-mulching (cracking) clays are widespread and can occur in association with minor occurrences of red and brown cracking clays (DSEWPC 2012)
- usually occur on level to gently undulating gilgai plains (DSEWPC 2012)
- most occurrences of the Murray Valley Grasslands are associated with Quaternary alluvial sediments (including the Shepparton formation), consisting of calcareous clay loams and clays on wetter sites, including self-mulching (cracking) clays (DSE, 2010)
- dominance of perennial tussock grasses, a lack of woody plants and the presence of broad-leaved herbs in the inter-tussock spaces. This ecological community may also be dominated or co-dominated by a range of forb species depending on seasonal conditions and management history. Hence, the ecological community ranges from open to closed tussock grassland dominated by one or more of *Rytidosperma spp.* (wallaby-grasses), *Austrostipa spp.* (spear-grasses) and *Enteropogon ramosus* or *E. acicularis* (curly windmill grass, spider grass). In areas where grasses are sparse it may be a herbland/forbland (DSEWPC 2012).

B2.6.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

A summary of the relevant Commonwealth guidelines and policy statements available for this threatened ecological community is as follows:

- Conservation Advice: “Approved Conservation Advice for Natural Grasslands of the Murray Valley Plains ecological community” (DSEWPC 2012).
- Listing Advice: “Commonwealth Listing Advice on Natural Grasslands of the Murray Valley Plains” (DSEWPC 2012).

Table B.7 identifies the sections of the Revised BDAR where key information relating to the assessment and management of this species is presented.

Table B.7 Reference to relevant sections of the Revised BDAR for Natural Grasslands TEC

Relevant sections of the Revised BDAR
TEC Information and assessment – sections 4.2, 6.2.1 and 6.2.2.3
Impacts – sections 9.1.4, 11.1 and Chapter 12
Avoidance and Minimisation Measures – Chapter 8
Figures – Chapter 15

B2.6.3 Specific impacts

The following vegetation types recorded within the Indicative disturbance footprint were considered consistent with the Murray Valley Grasslands listing based on condition criteria:

- PCT 44 – Forb-rich Speargrass – Windmill Grass – White Top grassland of the Riverina Bioregion
- PCT 45 – Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion
- PCT 46 – Curly Windmill Grass – spear grass – wallaby grass grassland on alluvial clay and loam on the Hay plains, Riverina Bioregion.

Based on these assessments, the amended project is estimated to impact upon 81.05 ha of the Murray Valley Grasslands.

B2.6.4 Significant impact criteria

An action is likely to have a significant impact on a critically endangered ecological community if there is a real chance or possibility that it will:

- *reduce the extent of an ecological community*

The EPBC listing advice for the Murray Valley Grasslands notes that there has been a decline in the Murray Valley Grasslands extent of about 86% to 87.5% across its range. The current extent of the community is estimated between 153,000 to 168,000 nationally, and the amended project is located at the northern limit of the extent of the TEC. The loss of 81.05 ha would represent around 0.05% of the remaining extent of the TEC and would reduce the range of occurrence.

- *fragment or increase fragmentation of an ecological community*

The amended project would require the removal and/or disturbance of up to 81.05 ha of Murray Valley Grasslands within areas of varying disturbance. This community generally occurs within a fragmented landscape affected by other impacts such as agriculture. Disturbance of this community would in general be in a linear configuration and while avoidance of the community would be undertaken as far as practical, some patches would be bisected. Therefore, the amended project would increase fragmentation of Murray Darling Grasslands within the area.

- *adversely affect habitat critical to the survival of an ecological community*

Murray Darling Grasslands within the Indicative disturbance footprint occurs as fragmented patches with a variety of condition types. The Listing Advice on Murray Darling Grasslands (DSEWPC 2012) does not map or describe any habitats or areas critical to the survival of this community.

'Habitat critical to the survival of an ecological community' refers to areas that are necessary:

- for the long-term maintenance of the ecological community (including the maintenance of species essential to the survival of the ecological community, such as pollinators)
- to maintain genetic diversity and long-term evolutionary development, or
- for the reintroduction of populations or recovery of the ecological community.

Widespread occurrence of this community occurs across the region in a scattered nature of patches intersected by the amended project. As the areas within the Indicative disturbance footprint are at the upper end of the Murray Valley Grasslands range, some patches are very large and all patches contained good native species cover and multiple indicator species consistent with the community definition, it is possible the habitat to be impacted is important for genetic diversity, long-term maintenance and survival. Therefore, the habitat to be impacted is likely part of habitat critical to the survival of this community.

- *modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns*

Any large-scale excavation that occurs in close proximity to the community or to marginal patches would involve mitigation measures to minimise sedimentation and hydrological impacts. The amended project also involves minimal disturbance to the ground level based on stringing transmission lines across areas of the Murray Valley Grasslands. Therefore, the amended project is considered unlikely to substantially modify or destroy these abiotic factors.

- *cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting.*

The amended project would require the removal and/or disturbance Murray Darling Grasslands within a variety of condition classes, including modified patches. Additionally, the community generally occurs in a variety of modified conditions as a result of existing disturbance practices in the area. This has resulted in the modification of the communities structurally integrity i.e. areas of lower species diversity and varying dominance of exotic flora.

The amended project would not involve regular burning or flora and fauna harvesting, and outside of the proposed clearing areas, the amended project is considered unlikely to substantially change the species composition of an occurrence of this community.

- *will the action cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:*
  - *assisting invasive species, that are harmful to the listed ecological community, to become established*
  - *causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community.*

Given the previous land use (i.e. agricultural and rural infrastructure), invasive weeds species are already present within the Landscape and in the Murray Darling Grasslands within the Indicative disturbance footprint. It is therefore considered unlikely that the amended project would substantially reduce the quality or integrity of the community's occurrence through increasing the spread of invasive species.

Additionally, mitigation measures would be implemented, such as weed and pest management plans, vegetation clearing protocols, installation vehicle wash stations and sediment and control measures, to minimise the likelihood of spread of weeds or pathogens into the site. These mitigation measures would aid in reducing potential impacts associated with the amended project that may otherwise result in the further reduction of the community's quality.

- *interfere with the recovery of an ecological community*

The approved conservation advice for Murray Darling Grasslands includes a number of priority actions for the conservation of the TEC, including:

- protect and conserve remnants of the ecological community. Further clearance, disturbance and fragmentation of this ecological community should be avoided
- identify remnants of high conservation priority, with a focus on small scale linkages and habitat connectivity as many grasslands fauna and flora are unable to move across larger landscape-scale barriers
- ensure infrastructure works, maintenance activities (e.g. road works) or development activities involving substrate or vegetation disturbance in areas where the Natural Grasslands of the Murray Valley Plains TEC occurs do not adversely impact on known occurrences.

The amended project is predicted to remove 81.05 ha of the TEC, which would interfere with all of the above priority actions and thus interfere with the recovery of the Murray Valley Grasslands.

B2.6.5 Conclusion

An estimated 81.05 ha of the Muray Darling Grasslands is predicted to be removed by the amended project, which would reduce the extent of Muray Darling Grasslands, increase fragmentation, impact on habitat critical to the survival of the TEC and potentially interfere with the recovery of this community. Therefore, it is considered likely that the amended project would have a significant residual impact on the Murray Darling Grasslands.

B3. Threatened flora

Database searches (BioNet, BAM-C and PMST) alongside Appendix A of the SEARs identified a list of 29 threatened flora species under the EPBC Act with predicted habitat or identified known habitat within the Indicative disturbance footprint. Five threatened species were recorded during the ecological surveys, with a further seven species are considered to have moderate to high likely of occurrence with the amended project (see Table B.8).

Table B.8 Threatened flora species listed under the EPBC Act considered for assessment within the amended project

Common name	Scientific name	EPBC status[1]	Likelihood of occurrence	Confirmed (ha)	Assumed (ha)	Total impact (ha)	Significant impact (Y/N)
Floating Swamp Wallaby-grass	*Amphibromus fluitans*	V	Moderate	0	0.72	0.72	N
–	*Austrostipa metatoris*	V	Moderate	0	1.07	1.07	N
–	*Austrostipa wakoolica*	E	Moderate	0	65.03	65.03	N
Mueller Daisy	*Brachyscome muelleroides*	V	Moderate	0	0.70	0.70	N
Mossgiel daisy	*Brachyscome papillosa*	V	Recorded	10.25	135.95	146.20	Y
A spike rush	*Eleocharis obicis*	V	Recorded	15.40	160.76	176.16	Y
Winged Peppercress	*Lepidium monoplocoides*	E	Recorded	2.47	83.54	86.01	N
Chariot Wheels	*Maireana cheelii*	V	Recorded	19.41	150.08	169.49	Y
Turnip Copperburr	*Sclerolaena napiformis*	E	Moderate	0.00	43.95	43.95	N
Slender Darling Pea	*Swainsona murrayana*	V	Recorded	121.41	201.06	322.47	N
Red Darling-pea, Red Swainson-pea	*Swainsona plagiotropis*	V	Moderate	0.00	46.12	46.12	N
Small Purple-pea	*Swainsona recta*	E	Moderate	0.00	0.62	0.62	N

(1) Indicates a species is listed V= Vulnerable, E = Endangered under the Environmental Protection and Biodiversity Conservation Act 1999.

Assessments of significance have been undertaken in accordance with the EPBC Significant Impact Guidelines 1.1 for all species recorded during the ecological survey or those identified as having a moderate to high likelihood of occurrence within the Indicative disturbance footprint.

B3.1 *Amphibromus fluitans* (Floating Swamp Wallaby-grass)

Amphibromus fluitans is listed as vulnerable under the EPBC Act.

B3.1.1 Description

Amphibromus fluitans occurs in southern, NSW. Victoria, South Australia and Tasmania. It also occurs in New Zealand. In NSW, it is recorded in the Albury region, near Narrandera and near Mathoura (Department of Environment Water Heritage and the Arts, 2008a). *Amphibromus fluitans* is an aquatic or semi-aquatic perennial grass up to 0.8 m tall and occurs in both natural and man-made water-bodies, including swamps, lagoons, billabongs and dams. The species is slender in stature with arching flowering stems which sit half submerged under the water. The flowering portion of the stalk stands erect at 35mm long, and flowering typically occurs between November and March. The species is essentially aquatic (NSW DCCEEW, 2025b).

B3.1.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

A summary of the relevant Commonwealth guidelines and policy statements available for this species is as follows:

- Approved conservation advice for this species: "Approved Conservation Advice for *Amphibromus fluitans* (River Swamp Wallaby-grass)" (Department of Environment Water Heritage and the Arts, 2008a). In effect under the EPBC Act from 26-Mar-2008
- The Commonwealth listing advice for this species: "Commonwealth Listing Advice on *Amphibromus fluitans* (River Swamp Wallaby-grass)" (Threatened Species Scientific Committee, 2012). In effect under the EPBC Act from 29-Jun-2012.

Table B.9 identifies the sections of the Revised BDAR where key information relating to the assessment and management of this species is presented.

Table B.9 Reference to relevant sections of the Revised BDAR for *Amphibromus fluitans*

Relevant sections of the Revised BDAR
Methodology and survey effort – sections 2.3, 2.5 and 5.4
Habitat Information – sections 5.1.2, 5.2 and 5.3
Impacts – sections 9.1.5, 11.1.2 and Chapter 12
Avoidance and Minimisation Measures – Chapter 8
Figures – Chapter 15

B3.1.3 Specific impacts

Amphibromus fluitans has not been recorded within the Indicative disturbance footprint to date, however, has been assumed present based on suitable habitat (semi-permanent or ephemeral wetlands or periodically inundated sites) and associated PCTs within the Murray Fans IBRA subregion. The following associated PCTs have been mapped or recorded within the Indicative disturbance footprint:

- PCT 11 – River Red Gum – Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
- PCT 17 – Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
- PCT – 160 Nitre Goosefoot shrubland wetland on clays of the inland floodplains.

For the purpose of this assessment, the species has been assumed present within associated habitats in the Indicative disturbance footprint. Associated habitat impacts from the amended project total 0.72 ha for *Amphibromus fluitans.*

B3.1.4 Is this part of an important population?

In accordance with the *Matters of National Environmental Significance - Significant Impact Guidelines 1.1* (Department of the Environment, 2013b) the presence of an important population must be identified prior to addressing the significance impact criteria. An important population is defined in the Significant Impact Guidelines as a population that is necessary for a species' long-term survival and recovery.

Under the Act, important populations are:

- likely to be key source populations either for breeding or dispersal
- likely to be necessary for maintaining genetic diversity
- at or near the limit of the species range.

No important populations have been identified in the approved conservation advice and/or the EPBC Act listing advice, and there is a paucity of information available regarding population sizes and trends for the species. Within NSW, populations are known from the Albury region, near Narrandera and near Mathoura (Department of Environment Water Heritage and the Arts, 2008a). If present within the Indicative disturbance footprint, it is likely that a population of *Amphibromus fluitans* would be at the western extent of the species range and given the minimal records for this species within NSW, any existing populations would be potentially significant for genetic diversity, or dispersal. Consequently, it is presumed any population within the Indicative disturbance footprint is likely to be an important population.

B3.1.5 Significant impact criteria

— *lead to a long-term decrease in the size of an important population*

Amphibromus fluitans has specific habitat requirements with preferred habitat comprising of permanent swamps and wetlands that are at least moderately fertile and contain areas of bare ground, created by seasonally fluctuating water levels (Threatened Species Scientific Committee, 2012).

The amended project is likely to remove up to 0.72 ha of habitat for this species in the form of associated PCTs. The associated PCTs are well represented within the local area, with approximately 31921.84 ha of associated habitat (PCT 11, 17 and 160) found within the local area (10 km buffer of the Indicative disturbance footprint). The species is also associated with other PCTs. Given the lack of records and small area to be impacted, it is unlikely that the amended project would lead to a long-term decrease in the size of an important population of this species.

— *reduce the area of occupancy of an important population*

The amended project is likely to remove up to 0.72 ha of habitat for this species in the form of associated PCTs. The amended project occurs at the western extent of the known range of the species. Given the extent of associated habitat within the local area (31921.84 ha of PCT 11, 17 and 160) it is unlikely the amended project would significantly reduce the area of occupancy for an important population.

— *fragment an existing important population into two or more populations*

The amended project is likely to impact on up to 0.72 ha of habitat for this species. the amended project is linear in nature; it has been designed to avoid fragmentation of habitat to the greatest extent practicable through the application of design-stage avoidance and mitigation measures documented in the Revised BDAR.

These measures include micro siting of infrastructure and associated disturbance footprints during detailed design to avoid or minimise impacts on threatened species habitat, with priority given to avoiding areas where clearing could result in fragmentation or loss of key habitat features. Sensitive area mapping has been used to inform design and construction planning, and disturbance has been preferentially located within previously disturbed or modified areas where practicable.

In addition, the amended project will avoid waterways and associated riparian habitats where feasible, with targeted mitigation applied at unavoidable crossings to maintain habitat continuity. The configuration and extent of clearing have been refined to limit the creation of new barriers to movement and avoid severing habitat linkages.

The species has not been recorded in the Indicative disturbance footprint and given the small area of habitat to be impacted, it is unlikely the amended project would fragment an existing population in two or more populations.

- *adversely affect habitat critical to the survival of a species*

There is currently no listed habitat critical to the survival of this species under the EPBC Act (Commonwealth DCCEEW, 2025a). Habitat critical to the survival of a species also refers to areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal
- for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)
- to maintain genetic diversity and long-term evolutionary development, or
- for the reintroduction of populations or recovery of the species or ecological community (Department of the Environment, 2013b).

Amphibromus fluitans requires habitat that includes natural or man-made waterbodies, with most populations known to grow in areas with moderately fertile soils with some bare ground; conditions that are caused by seasonally fluctuating water levels. Habitat has been recorded for this species within the Indicative disturbance footprint, within 0.72 ha of associated PCTs being directly impacted. It is considered that habitat to be directly impacted within the Indicative disturbance footprint is unlikely to be of sufficient size to be important for the species long-term maintenance, genetic diversity or dispersal or suitable for the reintroduction of the species. Therefore, habitat within the Indicative disturbance footprint is not considered to be habitat critical to the survival of the species. The amended project will not result in an adverse impact on habitat critical to the survival of *Amphibromus fluitans*.

- *disrupt the breeding cycle of an important population*

Amphibromus fluitans requires periodic flooding of habitat to maintain wet conditions (Commonwealth DCCEEW, 2025a), which would not be impacted by the amended project. The amended project would result in a loss of 0.72 ha of confirmed habitat for the species which represents just 0.002% of the listed associated PCTs within the local area.

Given the lack of species records, scale (0.72 ha) and nature of the impacts (minimal impacts to riparian habitats and waterways) it is unlikely the amended project would disrupt the breeding cycle of an important population.

- *modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

The amended project is likely to remove up to 0.72 ha of habitat for the species, of which it is likely that only a marginal extent would be suitable to meet the ecological requirements of the species. Mitigations would be implemented for the amended project to minimise impacts to remaining habitats including controls for hydrological impacts, sedimentation and runoff, therefore, it is unlikely that the quality of retained habitat for the species would be significantly impacted. Approximately 31921.84 ha of associated habitat for *Amphibromus fluitans* within the local area would not be impacted by the amended project. While the amended project would remove a small area of habitat it is unlikely it would modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.

- *result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat*

The condition of associated vegetation for this species varies across the subject and with a number of invasive species (weeds and exotic herbivorous mammals) already present within the landscape. Mitigation measures vehicle wash stations and sediment, and control measures would be implemented, therefore it is unlikely the amended project would result in the introduction or spread of further invasive species that are harmful to *Amphibromus fluitans* becoming established.

- *introduce disease that may cause the species to decline*

There are no known diseases to which *Amphibromus fluitans* is susceptible under current guidelines and policy information. Biosecurity measures (e.g. vehicle and machinery wash-down procedures, equipment and footwear hygiene protocols, and management of soil movement in sensitive areas) would be implemented to reduce the likelihood of introducing the disease or pathogens that may contribute to the decline of the species.

- *interfere substantially with the recovery of the species*

There are currently no made recovery plan for the *Amphibromus fluitans*. However, the approved conservation advice for the species identifies a number of local and regional priority actions to assist in recovery including:

- minimising habitat loss, disturbance and modification through managing disruptions to waterflows, and managing threats to areas of vegetation of high priority.
- managing known threats to the species including invasive weeds trampling and grazing, increasing ecological, population and distributional knowledge of the species, increasing public awareness and managing known occurrences (Department of Environment Water Heritage and the Arts, 2008a).

The amended project would have marginal impacts on vegetation associated with this species therefore it is unlikely to substantially interfere with the actions listed or the overall recovery of the species.

B3.1.6 Conclusion

The amended project is likely to remove up to 0.72 ha of habitat for this species in the form of associated PCTs. The loss of habitat would represent 0.002% of the available habitat within the local area. The amended project would implement a number of controls to minimise and mitigate any impacts to riparian or aquatic habitats within the amended project footprint. This will include micro-siting of temporary construction infrastructure away from riparian areas, locating waterway crossings at narrow width locations where required and minimising the quantity of cut and fill activities. Riparian understorey impacts will be avoided where possible and riparian areas subject to disturbance will be progressively stabilised and rehabilitated to minimise impacts to aquatic habitats, water quality from sedimentation and erosion. Given the small area of habitat to be impacted and the control measures taken to minimise impacts, it is unlikely that the amended project would have a significant impact on *Amphibromus fluitans.*

B3.2 *Austrostipa metatoris*

Austrostipa metatoris is listed as Vulnerable under the EPBC Act.

B3.2.1 Description

Austrostipa metatoris is a perennial spear-grass that grows in tussocks to one metre tall. It occurs in NSW, along the Murray Valley near Balranald and the central-western slopes near Lake Cargelligo (DEWHA, 2008).

Habitat for *Austrostipa metatoris* includes sandhills, sand ridges, undulating plains and flat open Mallee landscapes, with red to red-brown clay-loam to sandy-loam soils. Associated species include Bimble Box (*Eucalyptus populnea*), Gum Coolibah (*E. intertexta*), White Cypress Pine (*Callitris glaucophylla*), Belah (*Casuarina cristata*), Sweet Quandong (*Santalum acuminatum*), Sticky Hopbush (*Dodonaea viscosa*), *Hakea ivoryi*, and the grasses *Austrostipa drummondii* and *A. eremophila* (DEWHA, 2008).

B3.2.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

A summary of the relevant Commonwealth guidelines and policy statements available for this species is as follows:

- Conservation advice: "Approved Conservation Advice for *Austrostipa metatoris"* (DEWHA, 2008). In effect under the EPBC Act from 03-Jul-2008.
- Threat abatement plans: "Threat abatement plan for competition and land degradation by rabbits." {Department of Environment and Energy, 2016 #3373}. In effect under the EPBC Act from 07-Jan-2017.

Table B.10 identifies the sections of the Revised BDAR where key information relating to the assessment and management of this species is presented.

Table B.10 Reference to relevant sections of the Revised BDAR for *Austrostipa metatoris*

Relevant section of the Revised BDAR
Methodology and survey effort – sections 2.3, 2.5 and 5.4
Habitat Information – sections 5.1.2, 5.2 and 5.3
Impacts – sections 9.1.5, 11.1.2 and Chapter 12
Avoidance and Minimisation Measures – Chapter 8
Figures – Chapter 15

B3.2.3 Specific impacts

Austrostipa metatoris has not been recorded within the Indicative disturbance footprint, however, has been assumed present based on the presence of suitable habitat and associated PCTs within the Murray Fans IBRA subregion. The following associated PCTs have been mapped or recorded within the Indicative disturbance footprint:

- PCT 7 – River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion
- PCT 28 – White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone.

For the purpose of this assessment, the species has been assumed present within associated habitats in the Indicative disturbance footprint. The amended project would impact a total of 1.07 ha off assumed habitat for *Austrostipa metatoris*.

B3.2.4 Is this part of an important population?

In accordance with the *Matters of National Environmental Significance - Significant Impact Guidelines 1.1* (DEWHA, 2013) the presence of an important population must be identified prior to addressing the significance impact criteria. An important population is defined in the Significant Impact Guidelines as a population that is necessary for a species' long-term survival and recovery. Under the Act, important populations are:

- likely to be key source populations either for breeding or dispersal
- likely to be necessary for maintaining genetic diversity
- at or near the limit of the species range.

No important populations have been listed for this species under the EPBC Act. Sites in NSW include Condobolin, Goolgowi, Cunninyeuk Station, Stony Crossing, Kyalite State Forest, Lake Cargelligo, south-west of Nymagee, and a ridge above Lake Benanee (DEWHA, 2008). The Indicative disturbance footprint does not occur at the limit of the species known range and given the small extent of habitat to be impacted 1.07 ha of assumed habitat within the indicative disturbance footprint the amended project is not expected to contain a population of suitable size to be significant for dispersal or genetic viability. Considering this, the Indicative disturbance footprint is unlikely to contain an important population of *Austrostipa metatoris*.

B3.2.5 Significant impact criteria

— *lead to a long-term decrease in the size of an important population*

The amended project is not expected to lead to a long-term decrease in the size of an important population of *Austrostipa metatoris* as there are no known important populations for the species within the Indicative disturbance footprint. In addition, the mitigation measures such as micro-siting towers would be implemented to reduce habitat impacts.

— *reduce the area of occupancy of an important population*

The amended project is not expected to reduce the area of occupancy of an important population of *Austrostipa metatoris* as there are no important populations were identified within the Indicative disturbance footprint.

— *fragment an existing important population into two or more populations*

No important populations for the species were identified in the Indicative disturbance footprint. Therefore, it is unlikely the amended project would fragment an existing population. In addition, mitigation measures including micro siting the towers will be implemented to further minimise impacts on assumed habitat for the species.

— *adversely affect habitat critical to the survival of a species*

To date, there is no listed habitat critical to the survival of this species under the EPBC Act (Commonwealth DCCEEW, 2025a). Habitat critical to the survival of a species also refers to areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal
- for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)
- to maintain genetic diversity and long-term evolutionary development, or
- for the reintroduction of populations or recovery of the species or ecological community (DEWHA, 2013).

The species is not known to occur within the Indicative disturbance footprint, and habitat is considered to be marginal. Therefore, it is unlikely habitat within the Indicative disturbance footprint would represent habitat critical to the survival of the species.

The amended project would impact on less than 0.003% of the habitat within the local area. Given the small area to be impacted, and habitat is not considered critical to the survival of the species, it is unlikely the amended project would adversely impact habitat critical to the survival of *Austrostipa metatoris*.

- *disrupt the breeding cycle of an important population*

No important populations of *Austrostipa metatoris* were identified within the Indicative disturbance footprint, therefore the amended project is not expected to disrupt the breeding cycle of an important population.

- *modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

The amended project would impact a total of 1.07 ha of assumed habitat for *Austrostipa metatoris*. However, mitigation measures such as micro-siting towers and management of invasive species would be implemented to reduce habitat impacts. The potential to impact upon a total of 1.07 ha is insignificant in comparison to the 27835.29 ha of associated habitat (PCT 7, PCT 28) found within the local area. This species is also associated with other PCTs. Given the small extent of impact to assumed habitat, the amended project is not expected to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.

- *result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat*

Invasive pest species including feral rabbits are considered a potential threat to *Austrostipa metatoris* (DEWHA, 2008). Mitigation measures including vehicle and machinery wash-down procedures, equipment and footwear hygiene protocols, and management of soil movement in sensitive areas would be implemented to reduce the spread or introduction of invasive weed species. Given these mitigation measures, the amended project is not expected to result in the further spread or introduction of invasive species that are harmful to *Austrostipa metatoris*.

- *introduce disease that may cause the species to decline*

There are no known diseases to which *Austrostipa metatoris* is susceptible under the current approved conservation advice (DEHWA, 2008). Mitigation measures such as vehicle and machinery wash-down procedures, equipment and footwear hygiene protocols, and management of soil movement in sensitive areas would be implemented to reduce the spread or introduction of disease and pathogens that can result in species decline. Given these protocols, the amended project is not expected to introduce disease that may cause the species to decline.

- *interfere substantially with the recovery of the species*

To date, there is no recovery plan for *Austrostipa metatoris*. However, the approved conservation advice for the species identifies a number of local and regional priority actions to assist in recovery including:

- minimise and/or manage habitat loss, disturbance and modification
- manage trampling, browsing and grazing of stock
- manage fire regimes
- promote conservation information and raise awareness
- enable recovery of additional sites and/or populations.

The amended project would impact a total of 1.07 ha of assumed habitat for *Austrostipa metatoris*, however it is not expected to substantially interfere with the recovery of the species.

B3.2.6 Conclusion

The amended project would impact a total of 1.07 ha of assumed habitat for *Austrostipa metatoris*. However, the species has not been recorded within the Indicative project footprint following extensive targeted survey effort within optimal survey period and the habitat associated PCTs are considered to be an over-representation of suitable habitat. Mitigation measures including micro-sited towers, weed and pest management plans, vegetation clearing protocols and biosecurity protocols would be implemented to reduce habitat loss and spread of invasive species. Given the small extent of associated habitat, lack of records within the Indicative disturbance footprint and extent of available habitat in the local area, it is unlikely the amended project would result in a significant residual impact on *Austrostipa metatoris*.

B3.3 *Austrostipa wakoolica*

Austrostipa wakoolica is listed as Endangered under the EPBC Act.

B3.3.1 Description

Austrostipa wakoolica is a tufted, perennial spear-grass that grows to one metre tall. This species is confined to the floodplains of the Murray River tributaries of central-western and south-western NSW, with localities including Manna State Forest, Matong, Lake Tooim, Merran Creek, Tulla, Cunninyeuk and South West Woodland Nature Reserve (DEH, 2025).

Austrostipa wakoolica grows in open woodland, on grey silty clay or sandy loam soils. Recorded habitats include the edge of a lignum swamp in brown loam with box and mallee, creek banks in grey silty clay, mallee and lignum sandy loam flat, open cypress pine forest on low range in sandy soil and a low rock rise fenced off from stock for about 18 months. Associated species include *Callitris glaucophylla, Eucalyptus microcarpa, Eucalyptus populnea, Austrostipa eremophila, Austrostipa drummondii, Austrodanthonia eriantha, Einadia nutans, Hyalosperma glutinosum subsp. glutinosum* and *Crassula* species (Department of the Environment, 2014).

B3.3.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

A summary of the relevant Commonwealth guidelines and policy statements available for this species is as follows:

- Conservation advice: "Approved Conservation Advice for *Austrostipa wakoolica* (a spear grass)" (Department of the Environment, 2014). In effect under the EPBC Act from 29-Apr-2014.
- Threat abatement plans: "Threat abatement plan for competition and land degradation by rabbits." {Department of Environment and Energy, 2016 #3373}. In effect under the EPBC Act from 07-Jan-2017.

Table B.11 identifies the sections of the Revised BDAR where key information relating to the assessment and management of this species is presented.

Table B.11 Reference to relevant sections of the Revised BDAR for *Austrostipa wakoolica*

Link to relevant section of the Revised BDAR
Methodology and survey effort – sections 2.3, 2.5 and 5.4
Habitat Information – sections 5.1.2, 5.2 and 5.3
Impacts – sections 9.1.5, 11.1.2 and Chapter 12
Avoidance and Minimisation Measures – Chapter 8
Figures – Chapter 15

B3.3.3 Specific impacts

Austrostipa wakoolica has not been recorded within the Indicative disturbance footprint, however, has been assumed present based on the presence of suitable habitat and associated PCTs within the Murray Fans and Murrumbidgee IBRA subregions. The following associated PCTs have been mapped or recorded within the Indicative disturbance footprint:

- PCT 17 – Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
- PCT 26 – Weeping Myall open woodland of the Riverina Bioregion and NSW Southwestern Slopes Bioregion
- PCT 28 – White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
- PCT 237 – Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone.

B3.3.4 Significant impact criteria

— lead to a long-term decrease in the size of a population

A total population size of at least 1,000,000 has been identified for this species since it was listed, of which a large proportion occurs in state forests and/or locations with few threats to long-term viability (Department of the Environment, 2014).

The species was not recorded within the amended project area, although associated habitat for the species was identified within a number of PCTs. Approximately 58847.11 ha of available assumed habitat is located within the local area. The amended project will result in the loss of 65.03 ha of assumed habitat for the species, which is a very small proportion of locally available habitat for the species (~0.28%).

Given the lack of records within the Indicative disturbance footprint an extent of habitat within the local area, it is unlikely the amended project would lead to a long-term decrease in the size of a population of *Austrostipa wakoolica*. Furthermore, mitigation measures such as micro-sited towers, application of vegetation clearing protocols, and implementation of weed, pest and biosecurity management measures would be implemented to reduce impacts to assumed habitat.

— reduce the area of occupancy of the species

The area of occupancy is unknown for this species. The Indicative disturbance footprint occurs within the species known distribution, which is the floodplains of the Murray River tributaries of central-western and south-western NSW. The amended project would result in the loss of 65.03 ha of assumed habitat for the species, which is a very small proportion of locally available habitat for the species. Given the lack of records to date, small number of known locations for the species and extent of habitat within the local area it is unlikely the amended project would reduce the area of occupancy of *Austrostipa wakoolica*.

— fragment an existing population into two or more populations

It is possible there would be marginal localised fragmentation of habitat due to the linear nature of the amended project, however, much of the vegetation within the amended project corridor has been subjected to historical land clearing and agricultural intensification and occurs in an existing fragmented state. Given the lack of records, small extent of assumed impact in regard to habitat within the local area, and mitigation measures to be implemented (i.e. micro-sited towers, locating temporary construction impacts in areas of lower biodiversity values and threatened species unexpected finds procedures), the amended project is not expected to fragment an existing important population into two or more populations.

— adversely affect habitat critical to the survival of a species

To date, there is no listed habitat critical to the survival of this species under the EPBC Act (Commonwealth DCCEEW, 2025a). Habitat critical to the survival of a species also refers to areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal
- for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)
- to maintain genetic diversity and long-term evolutionary development, or
- for the reintroduction of populations or recovery of the species or ecological community (DEWHA, 2013).

The vegetation within the Indicative disturbance footprint has experienced historical land clearing and agricultural intensification Given the lack of records in this area, and condition of the habitat, it is unlikely the habitat would be essential for dispersal or maintaining the genetic diversity of the species or likely to aid in the recovery of the species. Therefore, habitat within the Indicative disturbance footprint is not considered to represent habitat critical to the survival of the *Austrostipa wakoolica*. The amended project would not adversely impact habitat critical to the survival of the species.

- *disrupt the breeding cycle of a population*

Austrostipa wakoolica flowers in response to rain and has been recorded flowering from October to December. Seed dispersal is via wind, rain and flood events, of which the awn and sharp point of the floret appear to be an adaptation to bury the seed into the soil. The grass seeds are believed to be viable for three to five years (Department of the Environment 2014).

Given that the species is dependent on weather factors i.e. wind, rain and flood events for seed dispersal, and *wakoolica* was not recorded in within the Indicative disturbance footprint, the amended project is not expected to disrupt the breeding cycle of an important population.

- *modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

The amended project would impact 65.03 ha of assumed habitat of habitat for *Austrostipa wakoolica*. Approximately 58847.11 ha of available habitat is located within the local area. Given the small area to be impacted and extent of available habitat in the local area, it is unlikely the amended project would modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline. In addition, mitigation measures such as micro-sited towers and management of invasive species would be implemented to reduce impact on the assumed habitat for the species,

- *result in invasive species that are harmful to an endangered species becoming established in the endangered species' habitat*

Invasive species including exotic grasses are considered a potential threat to *Austrostipa wakoolica* (Department of the Environment, 2014). Mitigation measures including installation of vehicle wash stations would be implemented to reduce the spread or introduction of invasive weed species. Given these mitigation measures, the amended project is not expected to result in the further spread or introduction of invasive species that are harmful to *Austrostipa wakoolica*.

- *introduce disease that may cause the species to decline*

There are no known diseases to which *Austrostipa wakoolica* is susceptible under the current approved conservation advice (Department of the Environment, 2014). Mitigation measures such as biosecurity protocols (e.g. vehicle and equipment wash-down and hygiene protocols) would be implemented to reduce the spread or introduction of disease and pathogens that can result in species decline. Given these protocols, the amended project is not expected to introduce disease that may cause the species to decline.

- *interfere with the recovery of the species*

To date, there is no recovery plan for *Austrostipa wakoolica*. This species has been allocated to the 'Keep Watch' management stream, meaning that the relevant experts have decided that the species is likely to be secure (with 95% confidence) over 100 years without any direct intervention and/or management (Department of the Environment, 2014).

The approved conservation advice for the species outlines priority actions for recovery including:

- fence sites where feasible or discourage access of herbivores
- survey for new populations
- weed control in habitat areas
- annual monitoring of fenced areas to determine the influence of different grazing animals
- conduct weed control at 5 selected sites and monitor benefit
- prevent further loss of extant populations
- monitor mining proposals in the vicinity and ameliorate potential damage

- collect seed for NSW Seedbank. Develop collection program in collaboration with Botanic Gardens and Domain Trust – multiple provenances
- conduct ecological research into specific germination and disturbance requirements and limitations
- identify two targeted populations (per year over initial three years) and focus recovery actions there, applying adaptive management strategies to determine and ameliorate threats (Department of the Environment, 2014).

The amended project would impact 65.03 ha of assumed habitat for *Austrostipa wakoolica*, however it is not expected this would interfere to any of the recovery actions outlined.

B3.3.5 Conclusion

The amended project would impact 65.03 ha of assumed habitat of habitat for *Austrostipa wakoolica*. Mitigation measures including micro-sited towers, weed and pest management controls, vegetation clearing protocols and biosecurity protocols would be implemented to minimise the impacts on assumed habitat for the species. Given the small scale of the impact, extent of habitat in the local area and lack of records for the species, it is considered unlikely the amended project would result in a significant residual impact on *Austrostipa wakoolica*.

B3.4 *Brachyscome muelleroides* (Mueller Daisy)

Brachyscome muelleroides is listed as vulnerable under the EPBC Act.

B3.4.1 Description

Brachyscome muelleroides is endemic to south-eastern Australia, being restricted to the Murray and Murrumbidgee Rivers. Five population sites have been surveyed with precise location details, four of which being on Morundah Station, NSW. The overall distribution of the Mueller Daisy is uncertain due to lack of survey effort, the species inconspicuous nature, alongside the environmental factors the species relies on to grow annually. The Mueller Daisy occurs in shallow depressions, swamp margins, heavy grey cracking clays, to grassy woodland habitats, all restricted to locations with seasonally damp situations. The species has a habitat constraint of floodplains on grey-brown or red-brown clays and claypans, alongside permanent or ephemeral wet areas (Lucas, 2010).

B3.4.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

A summary of the relevant Commonwealth guidelines and policy statements available for this species is as follows:

- Recovery plan: "National Recovery Plan for the Mueller Daisy *Brachyscome muelleroides*" (Lucas, 2010), in effect under the EPBC from 13-Aug-2010.

Table B.12 identifies the sections of the Revised BDAR where key information relating to the assessment and management of this species is presented.

Table B.12 Reference to relevant sections of the Revised BDAR for *Brachyscome muelleroides*

Relevant section of the Revised BDAR
Methodology and survey effort – sections 2.3, 2.5 and 5.4
Habitat Information – sections 5.1.2, 5.2 and 5.3
Impacts – sections 9.1.5, 11.1.2 and Chapter 12
Avoidance and Minimisation Measures – Chapter 8
Figures – Chapter 15

Brachyscome muelleroides has not been recorded within the Indicative disturbance footprint to date, however, has been assumed present based on the presence of suitable habitat (floodplains on grey-brown or red-brown clays and claypans. Semi-permanent/ephemeral wet areas) and associated PCTs within unsurveyed areas. The following associated PCTs have been recorded or mapped within unsurveyed areas of the Indicative disturbance footprint:

- PCT 44 – Forb –rich Spear grass – Windmill Grass – White Top grassland of the Riverina Bioregion
- PCT 45 - Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW Southwestern Slopes Bioregion
- PCT 46 – Curly Windmill Grass – spear grass – wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion.
- PCT 47 – Swamp grassland wetland of the Riverine Plain.

Associated habitat impacts from the amended project total 0.70 ha for *Brachyscome muelleroides.*

B3.4.3 Is this part of an important population?

In accordance with the *Matters of National Environmental Significance - Significant Impact Guidelines 1.1* (Department of the Environment, 2013b) the presence of an important population must be identified prior to addressing the significance impact criteria. An important population is defined in the Significant Impact Guidelines as a population that is necessary for a species' long-term survival and recovery. Under the Act, important populations are:

- likely to be key source populations either for breeding or dispersal
- likely to be necessary for maintaining genetic diversity
- at or near the limit of the species range.

No important populations have been listed for this species under the EPBC Act (Commonwealth DCCEEW, 2025b) and there is little information on the current location and status of the species. The species has been recorded from about 20 locations since 1900, only about 13 locations since 1930 and only eight locations since 1990. The most important site appears to be Morundah Station in NSW, a Commonwealth Department of Defence property leased for grazing, which has almost all currently recorded plants (Lucas, 2010).

Taking a precautionary approach, any additional populations occurring within the Indicative disturbance footprint would potentially be at the southern or western extent of the species known range, and given the small number of populations, would likely be important for dispersal or genetic diversity. Given this, any population occurring within the Indicative disturbance footprint has been presumed to be an important population.

B3.4.4 Significant impact criteria

— *lead to a long-term decrease in the size of an important population*

Little is currently known about the locations and status of *Brachyscome muelleroides*. Historically the species is known was known to occur at 20 locations in 1900, and only 13 locations in 1930 and eight in 1989. The species was not recorded in within the Indicative disturbance footprint despite targeted surveys undertaken in appropriate seasonal conditions.

The amended project is likely to remove up to 0.70 ha of assumed habitat for this species. There is 197931.76 ha of associated habitat (PCT 44, 45, 46 & 47) within the local area, and the species is also associated with other PCTs. The impact therefore represents less than 0.0004% of the available assumed habitat within the local area. Given the lack of species records, and small scale of the impacts it is unlikely that the amended project would lead to a long-term decrease in the size of an important population.

— *reduce the area of occupancy of an important population*

The amended project occurs within the known distribution of the species; however, the species has not been recorded within the impacted areas and impacts are restricted to areas of assumed impact. The amended project would result in the loss of 0.70 ha of assumed habitat which represents less than 0.0004% of the available habitat within the local area. Given the scale of the impacts and extent of habitat within the local area, it is unlikely that the amended project would reduce the area of occupancy of an important population.

— *fragment an existing important population into two or more populations*

Given the nature of the amended project (stringing across tracts of habitat), it is unlikely the amended project would result in fragmentation of an important population into two or more populations. In addition, the towers will be micro-sited to avoid and minimise impacts to threatened species.

- *adversely affect habitat critical to the survival of a species*

No critical habitat for the species has been listed under the EPBC Act (Commonwealth DCCEEW, 2025b). Habitat critical to the survival of a species also refers to areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal
- for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)
- to maintain genetic diversity and long-term evolutionary development, or
- for the reintroduction of populations or recovery of the species or ecological community (Department of the Environment, 2013b).

Known habitat for this species includes seasonally damp areas such as shallow depressions and around the margins of swamps, lagoons and claypans, on heavy grey cracking clays to lighter clay loam soils, in grassland, grassy woodland and open forest habitats, growing in association with various grasses and seasonal aquatic plants such as Marsilea species. Density of groundcover vegetation may vary, being sparser when the depressions are flooded or have dried out, and quite dense when soil moisture remains high in between wetting and drying cycles. Where trees are present, these are typically *Eucalyptus camaldulensis* or, less commonly, *E. macrocarpa*. Limited to habitat on floodplains on grey-brown or red-brown clays and claypans, and permanent or ephemeral wet areas (Lucas, 2010).

Although no habitat critical to the survival has been identified it is assumed that those areas where the above habitat is present and/or the species is known to occur would represent habitat critical to the survival of the species.

Habitat within the Indicative disturbance footprint is assumed only, as the species was not recorded despite extensive targeted surveys during the appropriate seasonal conditions. The habitat has been subjected to historical land clearing and agricultural practices and is fragmented. Given the lack of records and condition of the habitat it is unlikely to represent habitat critical to the survival of the species. The amended project will not adversely affect habitat critical to the survival of the species.

- *disrupt the breeding cycle of an important population*

Little ecological information is available on the breeding cycle of this species. It appears that sufficient autumn rainfall that results in localised soil waterlogging, or periodic flooding, is required to initiate seed germination and plant growth. Flowering typically occurs from September to November (Lucas, 2010). The species has not been recorded within the Indicative disturbance footprint to date. The amended project is unlikely to impact rainfall within the local region or change the hydrology so that the species would be unable to breed. In addition, the loss of 0.70 ha of habitat represents only a small proportion of habitat available within the local area. Therefore, it is unlikely the amended project would disrupt the breeding cycle of an important population.

- *modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

Approximately 0.70 ha of assumed habitat for *Brachyscome muelleroides* would be directly impacted within the Indicative disturbance footprint. The species has specific microhabitat requirements, however and preferred habitat includes seasonally damp areas on heavy clay and clay loam soils. This habitat is well represented within the local area with approximately 197931.76 ha of area within the local area. Given the lack of records and extent of habitat locally, it is unlikely that the amended project would modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.

- *result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat*

The condition of associated vegetation for this species varies across the subject and with a number of invasive species (weeds and exotic herbivorous mammals) already present within the landscape. Mitigation measures including weed and pest management plans, vegetation clearing protocols, installation vehicle wash stations and sediment, and control measures would be implemented, therefore it is unlikely the amended project would result in the introduction or spread of further invasive species that are harmful to *Brachyscome muelleroides* becoming established.

- *introduce disease that may cause the species to decline*

There are no known diseases to which *Brachyscome muelleroides* is susceptible under current guidelines and policy information. Biosecurity measures would be implemented to reduce the likelihood of introducing the disease or pathogens that may contribute to the decline of the species.

- *interfere substantially with the recovery of the species*

Within the approved national recovery plan for *Brachyscome muelleroides*, a number of key recovery actions have been identified for the species including:

- undertake surveys to determine the area and extent of populations, the number, size and structure of populations, and inference or estimation of population change
- survey known habitat and collect floristic and environmental information relevant to community ecology and condition
- identify and survey potential habitat, using ecological and bioclimatic information that may indicate habitat preference
- protect populations on public land
- protect populations on private land
- control threats from pest plants
- clarify and appropriately address threats from grazing
- evaluate current reproductive status, seed bank status, longevity, fecundity and recruitment levels
- identify key stimuli for seed germination requirements
- identify optimal flooding regimes to maintain habitat
- measure population trends and responses against recovery actions by collecting demographic information including recruitment and mortality, timing of life history stages and morphological data
- identify opportunities for community involvement in the conservation of the *B. muelleroides*.

The recovery plan for the species identifies a number of populations where the species is known to occur. The amended project will not impact on these populations. Given the lack of records in the Indicative disturbance footprint and small impact area at the local scale (0.0004%), it is unlikely the amended project would substantially interfere with the recovery of the species.

B3.4.5 Conclusion

Brachyscome muelleroides has not been recorded within the Indicative disturbance footprint to date and only 0.70 ha of assumed habitat for the species will be impacted by the amended project, representing approximately 0.0004% of the available habitat within the local area. The amended project is unlikely to significantly impact on an important population, impact habitat critical for survival, or interfere with the species recovery. It is unlikely the amended project would result in a significant residual impact on *Brachyscome muelleroides*.

B3.5 *Brachyscome papillosa* (Mossgiel Daisy)

Brachyscome papillosa is listed as vulnerable under the EPBC Act.

B3.5.1 Description

The *Brachyscome papillosa* is a multi-stemmed, perennial herb that is endemic to NSW and chiefly occurs within the Riverina Bioregion, from Mossgiel in the north, Murrumbidgee Valley (Yanga) National Park in the south west to Urana in the south east. Sites are scattered across this Bioregion including the Jerilderie area, the Hay Plain (Maude and Oxley) and around Darlington Point. In addition, there are a number of records from the Willandra Lakes World Heritage Area (including Mungo National Park) with a north-western outlier at Byrnedale Station, north of Menindee. The only known site on south western Slopes is Ganmain Reserve.

B3.5.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

A summary of the relevant Commonwealth guidelines and policy statements available for this species is as follows:

- Conservation advice: "Approved Conservation Advice for *Brachyscome papillosa* (Mossgiel Daisy)*"* (DEWHA 2008), in effect under the EPBC Act from 03-Jul-2008.

B3.5.3 Specific impacts

Populations of this species were recorded on light grey or grey, heavy clay soils in depressions associated with ephemeral waterways and red to red brown flat alluvial plains associated with PCT 15, PCT 46, PCT 163 and PCT 164. Habitat for the species occurs across the Indicative disturbance footprint, in the following vegetation types:

- PCT 13 – River Red Gum – Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
- PCT 15 – Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
- PCT 24 – Canegrass swamp tall grassland wetland of drainage depressions, lakes and pans of the inland plains
- PCT 44 – Forb-rich Speargrass – Windmill Grass – White Top grassland of the Riverina Bioregion
- PCT 45 – Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW Southwestern Slopes Bioregion
- PCT 46 – Curly Windmill Grass – speargrass – wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion
- PCT 157 – Bladder Saltbush shrubland on alluvial plains in the semi-arid (warm) zone including Riverina Bioregion
- PCT 159 - Old Man Saltbush shrubland mainly of the semi-arid (warm) climate zone (south western NSW)
- PCT 160 – Nitre Goosefoot shrubland wetland on clays of the inland floodplains
- PCT 163 – Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones
- PCT 164 – Cotton Bush open shrubland of the semi-arid (warm) zone
- PCT 216 – Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion.

This species was recorded in the Indicative disturbance footprint during surveys. The amended project would involve the clearing of approximately 146.20 ha of habitat for the species including 10.25 ha of confirmed habitat and 135.95 ha of assumed habitat.

Table B.13 identifies the sections of the Revised BDAR where key information relating to the assessment and management of this species is presented.

Table B.13 Reference to relevant sections of the Revised BDAR for *Brachyscome papillosa*

Relevant section of the Revised BDAR
Methodology and survey effort – sections 2.3, 2.5 and 5.4
Habitat Information – sections 5.1.2, 5.2, 5.3 and 5.3.1
Impacts – sections 9.1.5, 11.1.2 and Chapter 12
Avoidance and Minimisation Measures – Chapter 8
Figures – Chapter 15

B3.5.4 Is this part of an important population?

In accordance with the *Matters of National Environmental Significance - Significant Impact Guidelines 1.1* (Department of the Environment Water Heritage and the Arts, 2013), the presence of an important population must be identified prior to addressing the significance impact criteria. An important population is defined in the Significant Impact Guidelines as a population that is necessary for a species' long-term survival and recovery. Under the Act, important populations are:

- likely to be key source populations either for breeding or dispersal
- likely to be necessary for maintaining genetic diversity
- at or near the limit of the species range.

The population size of *Brachyscome papillosa* is currently unknown and the species is not considered adequately reserved in conservation areas. The species was recorded within the Indicative disturbance footprint and given the restricted distribution of the species it is consider that the population within the Indicative disturbance footprint would represent an important population.

B3.5.5 Significant impact criteria

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

- *lead to a long-term decrease in the size of an important population*

The amended project is likely to remove approximately 146.2 ha of habitat for the species (including 10.25 ha of confirmed habitat and 135.95 ha of assumed habitat) for *Brachyscome papillosa*. The species was recorded within the Indicative disturbance footprint and given the restricted distribution, there is a real chance or possibility that the Indicative disturbance footprint could be a key source population or necessary for maintaining genetic diversity.

There is 425,830.95 ha of associated habitat mapped within the local area (PCTs 13, 15, 24, 44, 45, 46, 157, 159, 160, 163, 164 and 216) and the species is also associated with other PCTs. The habitat to be removed therefore represents less than 0.03% of available habitat within the local area. Given the extent of habitat within the local area, it is unlikely the amended project would lead to a long-term decrease in the size of the population of *Brachyscome papillosa*.

- *reduce the area of occupancy of an important population*

The distribution of the species is restricted to the Riverina bioregion, with most records occurring from the Mossgiel to Urana districts form Jerilderie, Darlington Point, Willandra Lakes and north to Ivanhoe (DEWHA, 2008). Approximately 425,830 ha of associated habitat is present within the local area. The loss of 146.2 ha (including 10.25 ha of confirmed habitat and 135.95 of assumed habitat) for the species with the amended project represents just 0.03% of the available habitat within the local area, therefore it is unlikely to reduce in the area of occupancy for *Brachyscome papillosa*.

- *fragment an existing important population into two or more populations*

Given the linear nature of the amended project and impact on recorded individuals, the amended project would result in a small, localised fragmentation for this species. However, mitigations would be in place to ensure towers would be micro-sited and transmission lines strung across tracts of habitat. Given the extent of available habitat and scattered, opportunistic records of species within the local area, it is unlikely that this would significantly fragment a larger population.

- *adversely affect habitat critical to the survival of a species*

No Critical Habitat as defined under section 207A of the EPBC Act has been identified for *Brachyscome papillosa* or included in the Register of Critical Habitat (Department of Climate Change Energy the Environment and Water 2023). 'Habitat critical to the survival of a species or ecological community' refers to areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal
- for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)
- to maintain genetic diversity and long-term evolutionary development, or
- for the reintroduction of populations or recovery of the species or ecological community (Department of the Environment Heritage Water and the Arts 2009).

The habitat to be impacted also represents a small proportion (0.03%) of locally available habitat for the species. Mitigation measures such as micro-sited towers, locating temporary construction impacts in areas of lower biodiversity values and threatened species unexpected finds procedures would be put in place to further minimise impacts to habitat. However, given the limited information available on the species populations or distribution, it is possible that the proportion of individuals or habitat to be impacted represents habitat critical for dispersal, reintroduction or long-term maintenance of the species. Taking a precautionary approach, the amended project may adversely habitat critical to the survival of *Brachyscome papillosa.*

- *disrupt the breeding cycle of an important population*

The amended project is likely to result in direct impact to individuals occurring within the Indicative disturbance footprint which may have some impact on genetic diversity of local populations. Therefore, as a precautionary approach, any disturbance is likely to result in direct disruptions to the ecological processes and functions important for the life cycle of the species, though these impacts are likely to be localised.

- *modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

The amended project would result in the loss of 146.2 ha (including 10.25 ha of confirmed habitat and 135.95 ha of assumed habitat) for the species. The loss of habitat predicted to occur is in comparison to 425,830 ha of associated habitat that is present within the local area. Mitigation measures will be implemented including micro-siting towers and biosecurity measures to minimise the impacts on the species habitat. Therefore, given the extent of habitat within the local area and providing mitigation measures are implemented, it is unlikely the amended project would remove or decrease the availability of habitat to the extent that the species is likely to decline.

- *result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat*

Adhering to mitigation measures which would be put in place for the amended project such as weed control, would prevent potentially harmful invasive weeds establishing in *Brachyscome papillosa* habitat. As such, the amended project is unlikely to result in the establishment of invasive species that are harmful to the species habitat.

- *introduce disease that may cause the species to decline*

There are no known diseases causing potential species decline to *Brachyscome papillosa.* Biosecurity measure would be implemented to reduce the likelihood of introducing the disease or pathogens that may contribute to the decline of the species.

- *interfere substantially with the recovery of the species*

There is currently no recovery plan required for *Brachyscome papillosa*. The approved conservation advice for the species states priority actions including:

- design and implement a monitoring program, including surveying for additional populations and species response to disturbance
- ensure infrastructure or development activities in areas where *Brachyscome papillosa* occurs does not adversely impact on known populations
- prevent grazing pressures at known sites through exclusionary barriers.

The amended project would result in the loss of 146.2 ha (including 10.25 ha of confirmed habitat and 135.95 ha of assumed habitat) for the species. The loss of this habitat is likely to interfere with known populations of *Brachyscome papillosa*. Therefore, the amended project may interfere with the recovery of the species.

B3.5.6 Conclusion

Considering the highly restricted distribution of *Brachyscome papillosa* and limited data available on existing populations, taking a precautionary approach, it is possible the amended project would have a significant impact on the species.

B3.6 *Eleocharis obicis* (Spike rush)

Eleocharis obicis is listed as vulnerable under the EPBC Act.

B3.6.1 Description

Eleocharis obicis is a small, tufted perennial sedge that occurs in north-west Victoria and central south-west NSW growing in ephemerally wet environments including low-lying grasslands, roadside drains and depressions. NSW populations are known to occur on floodplains in heavy clay soils, claypans and red sandy soil atop clay. Flowering has been recorded in November.

B3.6.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

A summary of the relevant Commonwealth guidelines and policy statements available for this species is as follows:

- Conservation advice: "Approved Conservation Advice for *Eleocharis obicis.*" (Department of the Environment, Water, Heritage and the Art). In effect under the EPBC Act from 01-Oct-2008.
- Listing advice: "Commonwealth Listing Advice on *Eleocharis obicis* (a spike rush)." (Department of Sustainability, Environment, Water, Populations and Communities, 2012). In effect under the EPBC Act from 29-Jun-2012.
- Threat abatement plans:
  - "Threat abatement plan for predation, habitat degradation, competition and disease transmission by feral pigs *(Sus scrofa)"* {Department of the Environment and Energy, 2017 #3444}. In effect under the EPBC Act from 18-Mar-2017.
  - "Threat abatement plan for competition and land degradation by rabbits." {Department of Environment and Energy, 2016 #3373}. In effect under the EPBC Act from 07-Jan-2017.

Table B.14 identifies the sections of the Revised BDAR where key information relating to the assessment and management of this species is presented.

Table B.14 Reference to relevant sections of the Revised BDAR for *Eleocharis obicis*

Relevant section of the Revised BDAR
Methodology and survey effort – sections 2.3, 2.5 and 5.4
Habitat Information – sections 5.1.2, 5.2, 5.3 and 5.3.2
Impacts – sections 9.1.5, 11.1.2 and Chapter 12
Avoidance and Minimisation Measures – Chapter 8
Figures – Chapter 15

B3.6.3 Specific impacts

Within the Indicative disturbance footprint, *Eleocharis obicis* was recorded in recently inundated gilgais, within chenopod shrublands and freshwater wetlands.

Associated habitat for the species within the Indicative disturbance footprint includes the following PCTs:

- PCT 10 – River Red Gum – Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
- PCT 11 – River Red Gum – Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

- PCT 13 – Black Box – Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
- PCT 17 – Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
- PCT 24 – Canegrass swamp tall grassland wetland of drainage depressions, lakes and pans of the inland plains
- PCT 47 – Swamp grassland wetland of the Riverine Plain
- PCT 53 – Shallow freshwater wetland sedgeland in depressions on floodplains
- PCT 157 – Bladder Saltbush shrubland on alluvial plains in the semi-arid (warm) zone including Riverina Bioregion
- PCT 159 – Old Man Saltbush shrubland mainly of the semi-arid (warm) climate zone (south western NSW)
- PCT 160 – Nitre Goosefoot shrubland wetland on clays of the inland floodplains
- PCT 163 – Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones
- PCT 164 – Cotton Bush open shrubland of the semi-arid (warm) zone
- PCT 216 – Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
- PCT 237 – Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone.

This species was recorded in the Indicative disturbance footprint during surveys. The amended project would result in the loss of 176.16 ha of habitat for the species (15.4 ha of confirmed and 160.76 ha of assumed habitat).

B3.6.4 Is this part of an important population?

In accordance with the *Matters of National Environmental Significance - Significant Impact Guidelines 1.1* (Department of the Environment Water Heritage and the Arts, 2013), the presence of an important population must be identified prior to addressing the significance impact criteria. An important population is defined in the Significant Impact Guidelines as a population that is necessary for a species' long-term survival and recovery. Under the Act, important populations are:

- likely to be key source populations either for breeding or dispersal
- likely to be necessary for maintaining genetic diversity
- at or near the limit of the species range.

The species is known to occur in ephemerally wet situations such as roadside mitre drains and depressions, and gilgais. The approved conservation advice notes that *Eleocharis obicis* is locally frequent to abundant in western NSW. However, based on the DCCEEW Species Profile and Threat Database the known areas of occurrences are patchy and isolated. Therefore, given the species was recorded within the Indicative disturbance footprint, the species within the Indicative disturbance footprint are considered a likely key source and necessary for maintaining the genetic diversity of *Eleocharis obicis.* The Indicative disturbance footprint is likely to represent an important population of the species.

B3.6.5 Significant impact criteria

An action is likely to have a significant impact on a Vulnerable species if there is a real chance or possibility that it will:

- *lead to a long-term decrease in the size of an important population*

Given the restricted species distribution, it is likely the Indicative disturbance footprint could be necessary for maintaining genetic diversity or dispersal across the region. Therefore, the loss of 176.16 ha of habitat for the species (15.4 ha of confirmed and 160.76 ha of assumed habitat) would lead to a long-term decrease in the size of an important population.

- *reduce the area of occupancy of an important population*

The distribution for the species is known on the Lachlan River floodplains near Condobolin in NSW and far northeast of Victoria. The amended project does not occur at the extent of the known range of the species; however, the current extent and distribution is limited within NSW. Given the species was recorded within the Indicative disturbance footprint and the known distribution is patchy and characterised by isolated occurrences the amended project may result in a minor and localised reduction in the area of occupancy of the species.

- *fragment an existing important population into two or more populations*

The species can be found in fragmented environments including ephemerally wet areas such as roadside, drains and depressions. The habitat within the Indicative disturbance footprint occurs in varied levels of fragmentation. However, given the scale of impacts (176.16 ha of habitat for the species), direct impacts to the species, and the linear infrastructure, the amended project may result in some localised fragmentation to existing populations.

- *adversely affect habitat critical to the survival of a species*

No habitat critical to the survival of the species is currently listed under the EPBC Act. 'Habitat critical to the survival of a species or ecological community' refers to areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal
- for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)
- to maintain genetic diversity and long-term evolutionary development, or
- for the reintroduction of populations or recovery of the species or ecological community (Department of the Environment Heritage Water and the Arts 2009).

The species was recorded within the Indicative disturbance footprint, and its known distribution is patchy and characterised by isolated occurrences. As a result, the habitat within the Indicative disturbance footprint is likely to represent habitat critical to the survival of the species. The loss of approximately 176.16 ha of habitat for the species (15.4 ha of confirmed and 160.76 ha of assumed habitat) would therefore adversely affect habitat critical to the survival of the species.

- *disrupt the breeding cycle of an important population*

Details of the ages of sexual maturity, life expectancy and natural mortality of this species are currently unknown, though the species relies on ephemerally wet situations such as roadside mitre drains and depressions, usually in low-lying grasslands to complete its life cycle. The amended project would result in the loss of 176.16 ha of habitat for the species (15.4 ha of confirmed and 160.76 ha of assumed habitat) for the species. Given the minor fragmentation impacts and impacts to occupied habitat, it is possible this would impact on the breeding cycle of an *Eleocharis obicis* important population.

- *modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

The DCCEEW Species Profile and Threat Database shows known areas of occurrences to be patchy and isolated. The species was recorded within the Indicative disturbance footprint, therefore given the small patches of occurrence it is likely the loss of habitat associated with the amended project would, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.

- *result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat*

Mitigation measures including vehicle and machinery wash-down requirements, control of weed-infested materials, and implementation of ongoing biosecurity procedures during construction and operation, would be used to limit the spread of weeds, pathogens and disease. Given these measures, the amended project is unlikely to significantly contribute to the introduction or spread of invasive species not currently present in surrounding areas.

- *introduce disease that may cause the species to decline*

There are no known diseases that are specific to *Eleocharis obicis*. Mitigation measures would be used, such as weed and pest management plans, vegetation clearing protocols, installation vehicle wash stations and sediment and control measures. These would help to minimise the likelihood of introduction or spread of pathogens into the site. The amended project is unlikely to introduce disease or pathogens that may contribute to the decline of the species.

- *interfere substantially with the recovery of the species*

There is currently no approved recovery plan for this species, however the approved conservation advice priority action for the conservation of the species including minimizing adverse impacts to known sites and managing threats such invasives species. *Eleocharis obicis* was recorded within the Indicative disturbance footprint, and the amended project would result in the loss of 176.16 ha of habitat for the species for the species including direct impacts to recorded individuals. Therefore, it is likely the amended project would interfere with the recovery of the species.

B3.6.6 Conclusion

Based on the assessment above and considering the limited available information on the species distribution, populations and life cycle, there is a real chance or possibility that the amended project would have a significant residual impact on *Eleocharis obicis* through impacts on habitat and known populations.

B3.7 *Lepidium monoplocoides* (Winged Peppercress)

Lepidium monoplocoides is listed as endangered under the EPBC Act.

B3.7.1 Description

Lepidium monoplocoides is a small annual herb that occurs widely across the inland plains of south-eastern Australia, occurring from northern New South Wales to western Victoria (DCCEEW, 2010). The species occurs in a range of habitats on heavy clay or clay-loam soils within sparsely vegetated sites. Associated vegetation communities include grasslands, wetlands and floodplain woodlands dominated by *Eucalyptus coolabah*, and chenopod shrublands dominated by *Atriplex, Maireana* or *Nitraria* species.

B3.7.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

A summary of the relevant Commonwealth guidelines and policy statements available for this species is as follows:

- Adopted/made recovery plan: "National Recovery Plan for the Winged Peppercress *Lepidium monoplocoides"* (DSE, 2010), in effect under the EPBC Act from 13-Aug-2010.
- Threat abatement plans:
  - "Threat abatement plan for predation, habitat degradation, competition and disease transmission by feral pigs *(Sus scrofa)"* {Department of the Environment and Energy, 2017 #3444}. In effect under the EPBC Act from 18-Mar-2017.
  - "Threat abatement plan for competition and land degradation by rabbits." {Department of Environment and Energy, 2016 #3373}. In effect under the EPBC Act from 07-Jan-2017.

Table B.15 identifies the sections of the Revised BDAR where key information relating to the assessment and management of this species is presented.

Table B.15 Reference to relevant sections of the Revised BDAR for *Lepidium monoplocoides*

Link to relevant section of the Revised BDAR
Methodology and survey effort – sections 2.3, 2.5 and 5.4
Habitat Information – sections 5.1.2, 5.2, 5.3 and 5.3.4
Impacts – sections 9.1.5, 11.1.2 and Chapter 12
Avoidance and Minimisation Measures – Chapter 8
Figures – Chapter 15

B3.7.3 Specific impacts

This species was recorded within the Indicative disturbance footprint during surveys. *Lepidium monoplocoides* is associated with the following habitats within the Indicative disturbance footprint, in PCTs 13, 15, 24, 26, 45, 47, 46, 159, 160, 163, 170, 216 and 237. One population of *Lepidium monoplocoides* was recorded within the Murrumbidgee IBRA sub-region during targeted surveys. The associated vegetation community types for *Lepidium monoplocoides* cover a significant amount of the Indicative disturbance footprint area. Significant identified threats to the species includes the widespread clearing of grassland and grassy woodland habitats which associated to *Lepidium monoplocoides*. Other identified threats include weed invasion across all surveyed sites and altered hydrology whereby prolonged drought or water inundation reduces quality habitat. Physical damage is also considered a threat due to both vehicle tracks and off-road vehicle movement.

A total of 86.01 ha of habitat will be impacted by the amended project (including 2.47 ha of confirmed habitat and 83.54 ha of assumed habitat).

B3.7.4 Significant impact criteria

An action is likely to have a significant impact on endangered species if there is a real chance or possibility that it will:

- *lead to a long-term decrease in the size of a population*

All identified populations are identified as important to the conservation of the *Lepidium monoplocoides*. The species is currently known within 13 populations, seven being within New South Wales. The population size is estimated to be less than 3,000 plants within New South Wales; however, fluctuations occur annually based on hydrological cycles. The amended project would result in the loss of 86.01 ha of habitat (including 2.47 ha of confirmed habitat and 83.54 ha of assumed habitat). There is 224,481.63 ha of habitat mapped within the local area. The removal of 86.01 ha of habitat (including 2.47 ha of confirmed habitat and 83.54 ha of assumed habitat) would represent 0.04% of the available habitat for the species within the local area. Given the habitat is well represented in the local area and mitigation measures including micro-siting towers and biosecurity protocols it is unlikely the amended project would lead to a long-term decline in the size of a population.

- *reduce the area of occupancy of a population*

Lepidium monoplocoides is known to inhabit the Murray Darling Depression, Riverina, Darling Riverine Plains and Cobar Peneplain Bioregions. Within New South Wales, the species is known to occur on several locations across the Hay Plain, Urana Nature Reserve, Lake Cargelligo and Micabil. The Indicative disturbance footprint is located centrally within the wider distribution of the *Lepidium monoplocoides*, meaning the limit of distribution would not be impacted. However, the amended project is impacting on a recorded population of the species within the Murrumbidgee subregion. Therefore, the amended project will reduce the area of occupancy of a population.

- *fragment an existing important population into two or more populations*

Identified important populations are not known to be significantly affected by fragmentation or isolation. Large-scale clearing in the past has been identified as a threat to the species. However, towers would be micro sited to minimise impacts and the nature transmission line will span large tracts of habitat for the species. While the amended project would directly impact on a population; it is unlikely the amended project would fragment the population into two or more.

- *adversely affect habitat critical to the survival of a species*

No habitat critical to the survival of *Lepidium monoplocoides* has been identified within the recovery plan. The species may occur in a range of habitats involving sparsely vegetated sites on heavy clay or clay-loam soils. This is reflected by the extensive area in the Indicative disturbance footprint with vegetation types associated with *Lepidium monoplocoides*. While the species was recorded within the Indicative disturbance footprint and confirmed habitat would be removed, approximately 224,481.63 ha of habitat is mapped within the local area, and the loss of 86.01 ha of habitat (including 2.47 ha of confirmed habitat and 83.54 ha of assumed habitat) represents approximately 0.04% of habitat available within the local area. Therefore, the amended project is unlikely to adversely affect habitat critical to the survival of the species at a regional scale.

- *disrupt the breeding cycle of a population*

The specific method of seed dispersal is unknown for *Lepidium monoplocoides*. There is an association between the hydrology of the habitat and seed germination, where a regular wetting and drying cycle is required. Impacts on the hydrology in the Indicative disturbance footprint are expected to be minimal, with mitigation measures such as micro siting further reducing impacts to the species habitat. Further, 224,481.63 ha of associated habitat within local area would not be impacted. Therefore, it is unlikely the amended project would impact the breeding cycle of the species.

- *modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

Lepidium monoplocoides is associated with numerous plant community types found across the Indicative disturbance footprint. Such associated habitats cover a large amount of area, both within the Indicative disturbance footprint and extending out into the broader local area. Considering the extent of habitat available and the small extent of known records, it is unlikely the amended project would modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.

- *result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat*

Weed invasion from exotic annual grass species such as *Vulpia, Bromus, Lolium* and *Avena* species is an identified threat to the species. Grazing by high densities of rabbits is also suggested to somewhat impact some identified populations of *Lepidium monoplocoides*. Grazing inhibits seed dispersal through defoliation of individuals during critical flowering times. Due to past land uses, invasive species are already present within the Indicative disturbance footprint. Mitigation measures would be used to limit the spread of weeds, pathogens and disease (including vehicle and machinery wash-down requirements, control of weed-infested materials). Given these measures, the amended project is unlikely to significantly contribute to the introduction or spread of invasive species not currently present in surrounding areas.

- *introduce disease that may cause the species to decline*

There are no known diseases causing potential species decline to *Lepidium monoplocoides*. Mitigation measures would be used, such as weed and pest management plans, vegetation clearing protocols, installation vehicle wash stations and sediment and control measures. These would help to minimise the likelihood of introduction or spread of pathogens into the site.

- *interfere substantially with the recovery of the species*

The national recovery plan for the *Lepidium monoplocoides* identifies a number of objectives for the conservation and recovery of the species including:

- determining the distribution, abundance and population structure of the species, where ten populations are mapped for size, condition and habitat
- determine habitat requirements for the Winged Peppercress through surveying potential habitat, and testing a developed predictive model at five sites
- managing identified threats to populations across the distribution, including pest plants, human activity and grazing pressures.

The amended project is likely to result in the loss of 86.01 ha of habitat (including 2.47 ha of confirmed habitat and 83.54 ha of assumed habitat) for *Lepidium monoplocoides*. It is unlikely the loss of this habitat would substantially interfere with any of the recovery objectives outlined. Furthermore, mitigation measures would be implemented such as marking boundary of works, weed and pest management plans, vegetation clearing protocols, installation vehicle wash stations and sediment control to minimise indirect impacts on the *Lepidium monoplocoides* or its habitat.

B3.7.5 Conclusion

One population of *Lepidium monoplocoides* was recorded in the Indicative disturbance footprint during targeted surveys. The amended project would result in the loss of 86.01 ha of habitat (including 2.47 ha of confirmed habitat and 83.54 ha of assumed habitat) for the species. This represents 0.04% of the available habitat within the local area (10 km buffer of the indicative disturbance footprint). The amended project will implement a range of mitigation measure including biosecurity controls, and micro-siting of the towers. Given the nature of the amended project (transmission line spanning large tract of habitat), mitigation measures and extent of available habitat within the locality it is unlikely the amended project would result in a significant residual impact upon *Lepidium monoplocoides*.

B3.8 *Maireana cheelii* (Chariot Wheels)

Maireana cheelii is listed as vulnerable under the EPBC Act.

B3.8.1 Description

Maireana cheelii is restricted to the southern Riverina region of NSW, mainly in the area between Deniliquin and Hay. The species also has a limited distribution in Victoria where it is very rare. NSW collections have mainly been from the Moulamein, Deniliquin and Hay districts, including Tchelery and Zara Stations. The species is usually found on heavier grey soils and tends to grow in shallow depressions. Associated species include *Atriplex vesicaria, Maireana pentagona, M. excavate, M. ciliata, Cressa cretica, Avena fatua* and *Acacia homalophylla*.

B3.8.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

The relevant Commonwealth guidelines and policy statements available for this species are:

- Conservation advice: "Conservation Advice for *Maireana cheelii* (chariot wheels)" (DEWHA 2008), in effect under the EPBC Act from 20-Aug-2024.
- Adopted/made recovery plan: "National Recovery Plan for the Chariot Wheels *Maireana cheelii*" (DSE 2010), in effect under the EPBC Act from 13-Aug-2010.

Table B.16 identifies the sections of the Revised BDAR where key information relating to the assessment and management of this species is presented.

Table B.16 Reference to relevant sections of the Revised BDAR for *Maireana cheelii*

Relevant section of the Revised BDAR
Methodology and survey effort – sections 2.3, 2.5 and 5.4
Habitat Information – sections 5.1.2, 5.2, 5.3 and 5.3.5
Impacts – sections 9.1.5, 11.1.2 and Chapter 12
Avoidance and Minimisation Measures – Chapter 8
Figures – Chapter 15

B3.8.3 Specific impacts

Maireana cheelii was recorded throughout the Indicative disturbance footprint on primarily grey and red-brown clays. All habitat consisted of scalded, wind-swept clays where moisture had historically pooled. Vegetation types associated with this species included the following PCTs:

- PCT 15 – Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
- PCT 23 – Yarran tall open shrubland of the sandplains and plains of the semi-arid (warm) and arid climate zones
- PCT 24 – Canegrass swamp tall grassland wetland of drainage depressions, lakes and pans of the inland plains
- PCT 26 – Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
- PCT 44 – Forb-rich Speargrass – Windmill Grass – White Top grassland of the Riverina Bioregion
- PCT 46 – Curly Windmill Grass – speargrass – wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion

- PCT 58 – Black Oak – Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
- PCT 157 – Bladder Saltbush shrubland on alluvial plains in the semi-arid (warm) zone including Riverina Bioregion
- PCT 163 – Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones
- PCT 164 – Cotton Bush open shrubland of the semi-arid (warm) zone.

The amended project would result in the loss of 19.41 ha of confirmed habitat and 150.08 ha of assumed habitat, resulting in a total potential impact of 169.49 ha for the species.

B3.8.4 Is this part of an important population?

In accordance with the *Matters of National Environmental Significance - Significant Impact Guidelines 1.1* (Department of the Environment Water Heritage and the Arts, 2013), the presence of an important population must be identified prior to addressing the significant impact criteria. An important population is defined in the Significant Impact Guidelines as a population that is necessary for a species' long-term survival and recovery. Under the Act, important populations are:

- likely to be key source populations either for breeding or dispersal
- likely to be necessary for maintaining genetic diversity
- at or near the limit of the species range.

The approved conservation advice for the species notes that all naturally occurring populations are considered important to the persistence of this species.

B3.8.5 Significant impact criteria

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

- *lead to a long-term decrease in the size of an important population*

All defined populations of *Maireana cheelii* are considered to be important populations, and specimens have been recorded during surveys in the Indicative disturbance footprint. Considering the highly restricted distribution of this species and the impact on occupied habitat, it is likely that the amended project would result in a decrease in the size of an important population.

- *reduce the area of occupancy of an important population*

The approved conservation advice for the species notes that in NSW, the species mostly occurs between Hay and Deniliquin but extends as far west as Moulamein. The eastern extent of the *Maireana cheelii* distribution is not well known, but it is likely to occur up until the Newell highway between Jerilderie and Morundah. Noting that the amended project is located near the NSW limit of the species distribution, and that the amended project would impact on habitat containing recorded individuals, the loss of 169.49 ha of habitat (19.41 ha of confirmed habitat and 150.08 ha of assumed habitat) would reduce the area of occupancy for the *Maireana cheelii.*

- *fragment an existing important population into two or more populations*

Maireana cheelii are identified as having highly fragmented populations overall. Given the linear nature of the amended project, there is likely to be some minor, localised fragmentation of habitat for the species, though towers would be micro sited to minimise impacts.

- *adversely affect habitat critical to the survival of a species*

The approved conservation advice for the species notes habitat critical to the survival of *Maireana cheelii* includes all the area of occupancy of known subpopulations and area of similar adjoining habitat. Given the species was recorded within the Indicative disturbance footprint it is likely that the habitat would represent habitat critical to the survival of the species. The loss of 169.49 ha of habitat (19.41 ha of confirmed habitat and 150.08 ha of assumed habitat) would therefore adversely impact habitat critical to the survival of the species.

- *disrupt the breeding cycle of an important population*

Maireana cheelii is a hemicryptophyte, whereby the plant enters a dormancy phase in summer to early autumn to protect itself from desiccation. Following its dormancy phase, adult plants resprout from ground level or aerially. *Maireana cheelii* may display chemically induced seed dormancy, with seed inundation during small flooding events thought to trigger the end of seed dormancy. The mechanisms for seed dispersal are uncertain, but it is likely to be carried out by insects, particularly ants, and wind dispersal (DCCEEW, 2013). Given these dispersal mechanisms, the linear nature of the amended project is unlikely to create a barrier to dispersal or movement of the species within the local area.

- *modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

The amended project is located near the NSW limit of the species distribution. Considering this and the highly restricted distribution of the species, the loss of 169.49 ha of habitat (19.41 ha of confirmed habitat and 150.08 ha of assumed habitat)) has the potential to decrease the availability of habitat to the extent the species is likely to decline.

- *result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat*

Invasive weed species known to impact *Maireana cheelii* include pasture grasses such as *Vulpia spp.* And *Avena spp.* (oat grasses). Mitigation measures would be used to limit the spread of weeds, pathogens and disease. Given these measures, the amended project is unlikely to significantly contribute to the introduction or spread of invasive species not currently present in surrounding areas.

- *introduce disease that may cause the species to decline*

There are no known diseases currently contributing to the decline of *Maireana cheelii.* Mitigation measures would be used, such as weed and pest management plans, vegetation clearing protocols, installation vehicle wash stations and sediment and control measures. These would help to minimise the likelihood of introduction or spread of pathogens into the site.

- *interfere substantially with the recovery of the species*

The national recovery plan for *Maireana cheelii* states that the overall objective of recovery is to "minimise the probability of extinction of the Chariot Wheels in the wild and to increase the probability of populations becoming self-sustaining in the long term". This includes ensuring that important populations and their habitat are protected and managed.

The amended project would remove 169.49 ha of habitat (19.41 ha of confirmed habitat and 150.08 ha of assumed habitat) for an important population of the species, including occupied habitat, and habitat which is considered critical to the survival of the species. This is therefore likely to interfere substantially with the recovery of *Maireana cheelii*.

B3.8.6 Conclusion

Based on the assessment above, it is likely that the loss of 169.49 ha of habitat (19.41 ha of confirmed habitat and 150.08 ha of assumed habitat) would result in a significant residual impact *Maireana cheelii.*

B3.9 *Sclerolaena napiformis* (Turnip Copperburr)

Sclerolaena napiformis is listed as Endangered under the EPBC Act.

B3.9.1 Description

Sclerolaena napiformis is a small perennial chenopod shrub growing to about 30 cm high with slender branches covered with short, curled hairs. It is known from a few small populations in remnant grassland in the southern Riverina of NSW and north-central Victoria. NSW populations are confined to the area between Jerilderie and Moama on travelling stock routes and road reserves (DEH, 2025).

Sclerolaena napiformis occurs on inland plains in native grasslands and grassy woodlands on clay-loam soils. In NSW, the species occurs in Knotty Spear-Grass (*Austrostipa nodosa*) and Windmill Grass (*Chloris truncata*) tussock grasslands on grey to red-brown cracking clays and clay loams. Other common species in these habitats include wallaby-grasses (*Austrodanthonia* species), Spider Grass (*Enteropogon acicularis*), Paper Sunray (*Rhodanthe corymbiflora*), several Swainson-peas (*Swainsona* species) and several chenopod species.

B3.9.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

The relevant Commonwealth guidelines and policy statements available for this species are:

- Adopted/made recovery plan: "National Recovery Plan for the Turnip Copperburr (*Sclerolaena napiformis*)" (Department of Sustainability and Environment" (DSE), 2010). In effect under the EPBC Act from 13-Aug-2010.

Table B.17 identifies the sections of the Revised BDAR where key information relating to the assessment and management of this species is presented.

Table B.17 Reference to relevant sections of the Revised BDAR for *Sclerolaena napiformis*

Relevant section of the Revised BDAR
Methodology and survey effort – sections 2.3, 2.5 and 5.4
Habitat Information – sections 5.1.2, 5.2 and 5.3
Impacts – sections 9.1.5, 11.1.2 and Chapter 12
Avoidance and Minimisation Measures – Chapter 8
Figures – Chapter 15

B3.9.3 Specific impacts

Sclerolaena napiformis has not been recorded within the Indicative disturbance footprint, however, it has been assumed present based on the presence of suitable habitat and associated PCTs within the Murrumbidgee IBRA subregions. The following associated PCTs have been mapped or recorded within the Indicative disturbance footprint:

- PCT 26 – Weeping Myall open woodland of the Riverina Bioregion and NSW Southwestern Slopes Bioregion
- PCT 44 – Forb–rich Spear grass – Windmill Grass – White Top grassland of the Riverina Bioregion
- PCT 46 – Curly Windmill Grass – spear grass – wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion.

The amended project would impact a total of 43.95 ha of assumed habitat for *Sclerolaena napiformis*.

B3.9.4 Significant impact criteria

— lead to a long-term decrease in the size of a population

Six populations of *Sclerolaena napiformis* have been identified in NSW, all of which are confined to the area between Jerilderie and Moama on travelling stock routes and road reserves (DSE, 2010; DEH, 2025). Mitigation measures such as micro-sited towers would be implemented to reduce habitat impacts. Furthermore, the assumed habitat (PCT 26, 44 and 46) that would be impacted by the amended project only represents approximately 0.07% of the area of these PCTs (200,328 ha) within the local area. Given the lack of records within the Indicative disturbance footprint, the extent of habitat in the local area and mitigation measures, the impact of the amended project is not expected to lead to a long-term decrease in the size of a population of *Sclerolaena napiformis*.

— reduce the area of occupancy of the species

There are an estimated several hundred to several thousand *Sclerolaena napiformis* plants in NSW (DSE, 2010). Given the lack of records within the Indicative disturbance footprint and the fact that the populations of this species are located further south of the Indicative disturbance footprint, the removal of a total of 43.95 ha of assumed habitat by the amended project is considered unlikely to reduce the area of occupancy of *Sclerolaena napiformis*.

— fragment an existing population into two or more populations

It is possible there would be marginal localised fragmentation of habitat due to the linear nature of the amended project. However, much of the vegetation within the amended project footprint has been subjected to historical land clearing and occurs in an existing fragmented state. Given the lack of records in the Indicative disturbance footprint and the existing fragmented state, the amended project is not expected to significantly increase fragmentation to the point where an existing population would be fragmented into two or more populations.

— adversely affect habitat critical to the survival of a species

To date, there is no listed habitat critical to the survival of this species under the EPBC Act (Commonwealth DCCEEW, 2025a). Habitat critical to the survival of a species also refers to areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal
- for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)
- to maintain genetic diversity and long-term evolutionary development, or
- for the reintroduction of populations or recovery of the species or ecological community (DEWHA, 2013).

A total of 43.95 ha of assumed habitat occurs within the Indicative disturbance footprint and would be impacted by the amended project. The species has not been recorded within the Indicative disturbance footprint, and the assumed habitat is therefore considered an over-representation of suitable habitat. Given the lack of records, the marginal nature of the assumed habitat, and the extent of available habitat within the local area, habitat within the Indicative disturbance footprint is not considered likely to be habitat critical to the survival of the *Sclerolaena napiformis*. Therefore, it is unlikely the amended project would adversely impact habitat critical to the survival for this species.

— disrupt the breeding cycle of a population

This species becomes senescent in autumn and dies back to a thick taproot in the autumn and winter, shooting again in late spring. Viability of seed remains high (80%) after two years of storage, suggesting that seed may remain viable in the soil during unfavourable conditions (i.e. drought), with germination occurring when sufficient moisture becomes available (DSE, 2010). Given that the species is dependent on abiotic factors i.e. sufficient moisture, and since no populations of *Sclerolaena napiformis* were identified within the Indicative disturbance footprint, the amended project is not expected to disrupt the breeding cycle of a population.

- *modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

Habitat loss and degradation due to land clearing or grazing of domestic stock is a threat to *Sclerolaena napiformis* (DSE, 2010). Habitat degradation is a major threat to populations on roadsides, due to activities such ploughing, road maintenance, vehicle movement, utilities installation and maintenance and firebreak construction maintenance. Due to the nature of the amended project, it is not expected to impact on roadside habitat for *Sclerolaena napiformis*. The amended project would impact a total of 43.95 ha of assumed habitat for *Sclerolaena napiformis*. However, mitigation measures such as micro-sited towers and management of invasive species would be implemented to reduce impacts to assumed habitat. Given the relatively small extent of impact to assumed habitat and extent of available habitat in the local area, the amended project is not expected to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.

- *result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat*

Invasive weed species including *Avena* species (Wild Oats), *Echium plantagineum* (Paterson's Curse), Annual Beard-grass (*Polypogon monspeliensis*) and various introduced pasture grasses are considered a potential threat to *Sclerolaena napiformis* (DSE, 2010). Mitigation measures including weed and pest management plans, vegetation clearing protocols and installation of vehicle wash stations would be implemented to reduce the spread or introduction of invasive weed species. Given these mitigation measures, the amended project is not expected to result in the further spread or introduction of invasive species that are harmful to *Sclerolaena napiformis*.

- *introduce disease that may cause the species to decline*

There are no known diseases to which *Sclerolaena napiformis* is susceptible under the National Recovery Plan (DSE, 2010). Mitigation measures such as biosecurity protocols would be implemented to reduce the spread or introduction of disease and pathogens that can result in species decline. Given these protocols, the amended project is not expected to introduce disease that may cause the species to decline.

- *interfere with the recovery of the species*

Within the National Recovery Plan for *Sclerolaena napiformis* (DSE, 2010), a number of recovery objectives have been identified for the species, including:

- determine distribution, abundance and population structure
- determine habitat requirements
- manage threats to populations
- identify key biological characteristics
- determine life history and viability of populations
- establish an ex situ collection in cultivation
- build community support for its conservation.

The amended project would impact a total of 43.95 ha of assumed habitat for *Sclerolaena napiformis*, however it is not expected to substantially interfere with the recovery of the species given the extent of habitat in the local area (200,328 ha), the lack of records within the Indicative disturbance footprint, and the fact that known populations of this species are located further south of the Indicative disturbance footprint.

B3.9.5 Conclusion

The amended project would impact a total of 43.95 ha of assumed habitat for *Sclerolaena napiformis*. Mitigation measures including micro-sited towers, weed and pest management controls, vegetation clearing protocols and biosecurity protocols would be implemented to reduce habitat loss and spread of invasive species. Given the lack of records in the Indicative disturbance footprint, extent of habitat in the local area (200,328 ha), and implementation of mitigations measures to reduce habitat loss and degradation, significant impacts to *Sclerolaena napiformis* are considered unlikely.

B3.10 *Swainsona murrayana* (Slender Darling Pea)

Swainsona murrayana is listed as vulnerable under the EPBC Act.

B3.10.1 Description

Swainsona murrayana is a prostrate, ascending to erect perennial herb/forb growing up to 25 cm tall with densely pubescent stems. It is found throughout NSW and has been recorded in the Jerilderie and Deniliquin areas of the southern riverine plain, the Hay plain as far north as Willandra National Park, near Broken Hill as well as various localities between Dubbo and Moree.

This species has been collected from clay-based soils, ranging from grey, red and brown cracking clays to red-brown earths and loams. It grows in a variety of vegetation types including bladder saltbush, black box and grassland communities on level plains, floodplains and depressions and is often found with *Maireana* species. The species has also been found in remnant native grasslands or grassy woodlands that have been intermittently grazed or cultivated. Plants produce winter-spring growth, flower in spring to early summer and then die back after flowering. They re-shoot readily and often carpet the landscape after good cool-season rains. It is thought that *Swainsona murrayana* may require some disturbance and has been known to occur in paddocks that have been moderately grazed or occasionally cultivated.

B3.10.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

The relevant Commonwealth guidelines and policy statements available for this species are:

- Conservation advice: "Approved Conservation Advice for *Swainsona murrayana* (Slender Darling-pea)" (DEWHA 2008), in effect under the EPBC Act from 01-Oct-2008.
- Threat abatement plans:
  - "Threat abatement plan for predation, habitat degradation, competition and disease transmission by feral pigs *(Sus scrofa)"* {Department of the Environment and Energy, 2017 #3444}. In effect under the EPBC Act from 18-Mar-2017.
  - "Threat abatement plan for competition and land degradation by rabbits." {Department of Environment and Energy, 2016 #3373}. In effect under the EPBC Act from 07-Jan-2017.
  - "Threat abatement plan for competition and land degradation by unmanaged goats." {Department of the Environment Water Heritage and the Arts, 2008 #2892}. In effect under the EPBC Act from 01-Oct-2008.

Table B.18 identifies the sections of the Revised BDAR where key information relating to the assessment and management of this species is presented.

Table B.18 Reference to relevant sections of the Revised BDAR for *Swainsona murrayana*

Relevant section of the Revised BDAR
Methodology and survey effort – sections 2.3, 2.5 and 5.4
Habitat Information – section 5.1.2, 5.2, 5.3 and 5.3.7
Impacts – sections 9.1.5, 11.1.2 and Chapter 12
Avoidance and Minimisation Measures – Chapter 8
Figures – Chapter 15

B3.10.3 Specific impacts

Swainsona murrayana was recorded throughout the Indicative disturbance footprint. Populations spanned several vegetation types across the Indicative disturbance footprint including PCT 15, PCT 17, PCT 24, PCT 26, PCT 44, PCT 46, PCT 157, PCT 159 and PCT 164. Additional associated habitat in the form of PCT 23, PCT 28, PCT 163 and PCT 216 were recorded within the Indicative disturbance footprint.

Populations of this species were recorded from red, red-brown, light grey and grey clay soils and were not typically associated with any form of microhabitat. Due to design refinements and alterations, several areas of the Indicative disturbance footprint lack adequate survey effort and habitat was assumed for these areas where associated PCTs were present. The amended project would result in the loss of 322.47 ha of habitat (121.41 ha of confirmed habitat and 201.16 ha of assumed habitat).

B3.10.4 Is this part of an important population?

An important population of a vulnerable species is defined in the *Matters of National Environmental Significance – Significant Impact Guidelines 1.1* (DOE, 2013) as a population that is necessary for a species long term survival and recovery. An important population can be identified in a species recovery plan and/or defined as:

- a key source population either for breeding or dispersal of a species
- populations that are necessary for maintaining genetic diversity and/or
- populations that are at or near the limit of the species range.

In New South Wales, most recent records are from the South Western Plains in the Lockhart-Jerilderie-Deniliquin area and further north up to Hay and West Wyalong including Conargo Road and Urana Road, 16 km to the north-east of Jerilderie, where it was common in 1993 (MEL); Moulamein Road, north-north-west of Deniliquin (NSW, 1995 record); Hay (NSW, 1989 record); and 21 and 34 km west of Quandialla towards West Wyalong (NSW, 1996 and 1998 records). The Atlas of Living Australia (2015) has a number of isolated records in the north and west of the state.

Plant abundance is generally described as locally common to abundant in New South Wales, with counts ranging from single plants to at least 1000 plants made at various sites. Small numbers appear to represent incidental records, with potential population sizes likely to be much larger (NSW SC 2008b). Up to 200,000 individuals could occur within the 60 subpopulations in New South Wales (NSW SC 2008b). However, there is limited specific information available on population size and distribution of this species (Department of Environment Water Heritage and the Arts, 2008b).

Swainsona murrayana has been recorded sporadically across the state with a significant cluster between Moulamein, Urana and Hay. There are five database records of this species within the Indicative disturbance footprint. The species was recorded across the Indicative disturbance footprint during the targeted surveys. Given the limited data available on population size and distribution and taking a precautionary approach, it is considered that the species would represent an important population within the Indicative disturbance footprint.

B3.10.5 Significant impact criteria

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

- *lead to a long-term decrease in the size of an important population*

Scattered records of this species were identified in the Indicative disturbance footprint. The amended project would result in the loss of 322.47 ha of habitat (121.41 ha of confirmed habitat and 201.16 ha of assumed habitat). The loss of habitat would represent 0.07% of the mapped extent of these PCTs within the local area, which amounts to approximately 435,441 ha. Additional individuals were also opportunistically recorded in the wider locality. Considering the records and given the extent of existing habitat within the local area, it is unlikely the amended project would lead to a long-term decrease in the size of an important population.

- *reduce the area of occupancy of an important population*

The national area of occupancy for *Swainsona murrayana* is estimated at 22,400 (ELWP, 2021). While the amended project would result in the loss of habitat within the Indicative disturbance footprint, the area of occupancy of the population occurring within the Indicative disturbance footprint has not been defined. In the context of the species' national distribution and the extent of suitable habitat available within the local area, the loss of habitat associated with the amended project is unlikely to result in a meaningful reduction in the area of occupancy of an important population.

- *fragment an existing important population into two or more populations*

Records of the species within the landscape are already spatially dispersed. Although the amended project is linear, towers would be micro-sited and large spans used to minimise habitat disturbance. Any disturbance would be minor and localised and is unlikely to fragment an existing important population into two or more populations.

- *adversely affect habitat critical to the survival of a species*

No critical habitat or habitat critical to the survival of the species has been identified for this species. Habitat critical to the survival of a species also refers to areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal
- for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)
- to maintain genetic diversity and long-term evolutionary development, or
- for the reintroduction of populations or recovery of the species or ecological community (DEWHA, 2013).

No critical habitat or habitat critical to the survival of the species has been identified for this species. The population within the Indicative disturbance footprint is not at the limit of the species' distribution and forms part of a broader population occurring within the wider locality. In this context, the habitat affected by the amended project is not considered critical to the survival of the species. Therefore, the amended project would not adversely impact habitat critical to the survival of the species.

- *disrupt the breeding cycle of an important population*

The DCCEEW Species Profile and Threat Database notes that the species is perennial and resprouts from a persistent rootstock under suitable conditions. While the amended project would result in the loss of approximately 322.47 ha of habitat (121.41 ha of confirmed habitat and 201.16 ha of assumed habitat), including minor excavation works, impacts would be localised. Towers would be micro-sited, and the transmission line would span large areas of habitat reducing disturbance and maintaining connectivity for pollinators. In this context, the amended project is unlikely to disrupt the breeding cycle of an important population.

- *modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

The amended project would result in the loss of 322.47 ha of habitat (121.41 ha of confirmed habitat and 201.16 ha of assumed habitat). The species is likely to occur within the local area and the loss of habitat within the Indicative disturbance footprint would represent 0.07% of the extent of these habitats within the local area. Therefore, it is unlikely that the amended project would modify, destroy, remove or decrease the availability of habitat to the extent that the species is likely to decline.

- *result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat*

Invasive species are already present in the landscape. Mitigation measures including installation of vehicle wash stations would be implemented to reduce the spread or introduction of invasive weed species. It is therefore unlikely the amended project would result in further invasive species becoming established in habitat for *Swainsona murrayana.*

- *introduce disease that may cause the species to decline*

There are no known diseases causing potential species decline to *Swainsona murrayana.* Mitigation measures such as biosecurity protocols would be implemented to reduce the spread or introduction of disease and pathogens that can result in species decline. Given these protocols, the amended project is not expected to introduce disease that may cause the species to decline.

- *interfere substantially with the recovery of the species*

The approved conservation advice (2008) for the species lists a number of priorities for the recovery of the species including:

- monitor known populations to identify key threats
- monitor the progress of recovery, including the effectiveness of management actions and the need to adapt them if necessary
- ensure road widening and maintenance activities involving substrate or vegetation disturbance in areas where Slender Darling-pea occurs do not adversely impact on known populations
- identify populations of high conservation priority
- develop and implement a stock management plan for roadside verges and travelling stock routes manage sites to prevent introduction of invasive weeds, which could become a threat to the species, using appropriate methods.

The amended project would result in disturbance to known habitat and an important population of *Swainsona murrayana*. However, impacts would be localised and managed through design measures, including micro-siting of towers and minimising vegetation and substrate disturbance. In this context, the amended project is unlikely to interfere substantially with the recovery of the species.

B3.10.6 Conclusion

Swainsona murrayana is generally described as locally common to abundant in New South Wales, although population data are variable. The amended project would occur within known and assumed habitat for the species; however, this represents approximately 0.07% of available habitat within the local area. While the linear nature of the amended project may result in minor, localised fragmentation and disturbance, impacts are not expected to result in a decline of the species. With the application of avoidance and mitigation measures, it is unlikely the amended project would result in a significant residual impact on *Swainsona murrayana*.

B3.11 *Swainsona plagiotropis* (Red Darling-pea, Red Swainson-pea)

Swainsona plagiotropis is listed as Vulnerable under the EPBC Act.

B3.11.1 Description

Swainsona plagiotropis is a small, prostrate, perennial forb to 30 cm high, with densely white-downy stalks and reddish-purple to bright red pea-like flowers. This species is endemic to the riverine plains of inland south-eastern Australia, occurring in the upper Murray River Valley in NSW and Victoria. Records of this species suggests the existence of two large and extensive 'metapopulations'; one centred on Jerilderie in southern NSW, and the second between Echuca and Serpentine in northern Victoria. In addition, there are three disjunct occurrences: near Warren in central western NSW, Willandra National Park in western NSW, and near Warracknabeal in western Victoria (DCCEEW, 2024). Each of these five population groups are considered important to the long-term survival and recovery of the Red Darling-pea.

Swainsona plagiotropis occurs in native grassland and unimproved pasture. It favours seasonally waterlogged heavy red soils, including those in depressions and table drains in road reserves. It occurs in red-brown clay and clay loam soils but is absent from black low-lying soils. Habitat is dominated by perennial native grasses including *Austrodanthonia* spp. (wallaby grasses), *Austrostipa* spp. (spear grasses) and *Enteropogon acicularis* (spider grass), often with scattered small shrubby bluebushes such as *Maireana pentagona*, *M. excavata* and *M. humillima*.

B3.11.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

A summary of the relevant Commonwealth guidelines and policy statements available for this species is as follows:

- Conservation advice: “Approved Conservation Advice for *Swainsona plagiotropis*” (DCCEEW, 2024). In effect under the EPBC Act from 20-Aug-2024.
- Adopted/made recovery plan: “National Recovery Plan for the Red Swainson-pea *Swainsona plagiotropis*” (DSE, 2010). In effect under the EPBC Act from 13-Aug-2010.

Table B.19 identifies the sections of the Revised BDAR where key information relating to the assessment and management of this species is presented.

Table B.19 Reference to relevant sections of the Revised BDAR for *Swainsona plagiotropis*

Relevant section of the Revised BDAR
Methodology and survey effort – sections 2.3, 2.5 and 5.4
Habitat Information – sections 5.1.2, 5.2 and 5.3
Impacts – sections 9.1.5, 11.1.2 and Chapter 12
Avoidance and Minimisation Measures – Chapter 8
Figures – Chapter 15

B3.11.3 Specific impacts

Swainsona plagiotropis has not been recorded within the Indicative disturbance footprint, however, it has been assumed present based on the presence of suitable habitat and associated PCTs within the Murrumbidgee IBRA subregion. The following associated PCTs have been mapped or recorded within the Indicative disturbance footprint:

- PCT 26 – Weeping Myall open woodland of the Riverina Bioregion and NSW Southwestern Slopes Bioregion
- PCT 44 – Forb–rich Spear grass – Windmill Grass – White Top grassland of the Riverina Bioregion
- PCT 45 – Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW Southwestern Slopes Bioregion
- PCT 46 – Curly Windmill Grass – spear grass – wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion.

For the purpose of this assessment, the species has been assumed present within associated habitats in the Indicative disturbance footprint. The amended project would impact 46.12 ha of assumed habitat for *Swainsona plagiotropis*.

B3.11.4 Is this part of an important population?

In accordance with the *Matters of National Environmental Significance – Significant Impact Guidelines 1.1* (DEWHA, 2013) the presence of an important population must be identified prior to addressing the significance impact criteria. An important population is defined in the Significant Impact Guidelines as a population that is necessary for a species' long-term survival and recovery. Under the Act, important populations are:

- likely to be key source populations either for breeding or dispersal
- likely to be necessary for maintaining genetic diversity
- at or near the limit of the species range.

There are 14 important population groups of *Swainsona plagiotropis* in New South Wales, 12 centred around Jerilderie in southern NSW, one approximately 35 km north-west of Warren, and one within Willandra National Park (DCCEEW, 2024). As the amended project is located approximately 35 km north of the nearest important populations centred around Jerilderie and impacts to the species being limited to areas of assumed presence, the amended project is not considered to represent an important population of *Swainsona plagiotropis*.

B3.11.5 Significant impact criteria

— *lead to a long-term decrease in the size of an important population*

Fourteen important populations of *Swainsona plagiotropis* have been identified in New South Wales, 12 centred around Jerilderie, one located approximately 35 km north-west of Warren and one within Willandra National Park (DCCEEW, 2024). As the amended project is located approximately 35 km north of the nearest important populations centred around Jerilderie and impacts to the species being limited to areas of assumed presence, habitat within the Indicative disturbance footprint is not considered to represent an important population. Therefore, the amended project is unlikely to lead to a long-term decrease in the size of an important population of *Swainsona plagiotropis*.

— *reduce the area of occupancy of an important population*

As the population within the Indicative disturbance footprint is not considered to represent an important population of *Swainsona plagiotropis*, the amended project is unlikely to reduce the area of occupancy of an important population.

— *fragment an existing important population into two or more populations*

As the population within the Indicative disturbance footprint is not considered to represent an important population of *Swainsona plagiotropis*, the amended project is unlikely to fragment an existing important population into two or more populations.

- *adversely affect habitat critical to the survival of a species*

To date, there is no listed habitat critical to the survival of this species under the EPBC Act (Commonwealth DCCEEW, 2025a). Habitat critical to the survival of a species also refers to areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal
- for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)
- to maintain genetic diversity and long-term evolutionary development, or
- for the reintroduction of populations or recovery of the species or ecological community (DEWHA, 2013).

Marginal potential habitat has been assumed for this species across 46.12 ha of associated PCTs within the Indicative disturbance footprint. Given the lack of records for the species within the Indicative disturbance footprint, this is considered to over-represent suitable habitat. Accordingly, habitat within the Indicative disturbance footprint is not considered to represent habitat critical to the survival of *Swainsona plagiotropis*. The amended project will not adversely affect habitat critic for the survival of the species.

- *disrupt the breeding cycle of an important population*

As the population within the Indicative disturbance footprint is not considered to represent an important population of *Swainsona plagiotropis*, the amended project is unlikely to disrupt the breeding cycle of an important population.

- *modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

The amended project would impact 46.12 ha of assumed habitat for *Swainsona plagiotropis*. However, mitigation measures such as micro-sited towers and management of invasive species would be implemented to reduce habitat impacts. Given the small extent of impact to assumed habitat, and the fact that this represents 0.02% of the mapped extent of these PCTs within the local area (10 km from the Indicative disturbance footprint), the amended project is not expected to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.

- *result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat*

Invasive weed species including introduced pasture grasses, particularly canary grasses (*Phalaris* spp.), are considered a potential threat to *Swainsona plagiotropis* (DCCEEW, 2024). Mitigation measures including weed and pest management plans, vegetation clearing protocols and installation of vehicle wash stations would be implemented to reduce the spread or introduction of invasive weed species. Given these mitigation measures, the amended project is not expected to result in the further spread or introduction of invasive species that are harmful to *Swainsona plagiotropis*.

- *introduce disease that may cause the species to decline*

There are no known diseases to which *Swainsona plagiotropis* is susceptible under the current approved conservation advice (DEHWA, 2008). Mitigation measures such as biosecurity protocols would be implemented to reduce the spread or introduction of disease and pathogens that can result in species decline. Given these protocols, the amended project is not expected to introduce disease that may cause the species to decline.

- *interfere substantially with the recovery of the species*

The National Recovery Plan for *Swainsona plagiotropis* states that the overall objective of recovery is to minimise the probability of extinction of the Red Swainson-pea in the wild and to increase the probability of important populations becoming self-sustaining in the long term (DSE, 2010). This includes specific objectives such as:

- ensure that all populations and their habitat are protected and managed appropriately
- manage threats to populations.

Whilst the amended project would impact 46.12 ha of assumed habitat for *Swainsona plagiotropis*, it would not affect a known important population. Potential threats would be managed through the implementation of mitigation measures to minimise habitat disturbance. Accordingly, the amended project is unlikely to substantially interfere with the recovery of the species.

B3.11.6 Conclusion

The amended project would impact approximately 46.12 ha of assumed habitat for *Swainsona plagiotropis*; however, given the lack of records within the Indicative disturbance footprint, this is considered likely to over-represent suitable habitat. The affected area represents less than 0.02% of available habitat within the local area, and mitigation measures would be implemented to minimise habitat disturbance and degradation. Therefore the amended project is unlikely to result in a significant impact on *Swainsona plagiotropis*.

B3.12 *Swainsona recta* (Small Purple-pea)

Swainsona recta is listed as Endangered under the EPBC Act.

B3.12.1 Description

Swainsona recta is a slender, erect perennial herb growing to 30 cm tall. The leaves are divided into up to six pairs of 10 mm long, very narrow leaflets, each with a pointed tip. There is also a single leaflet at the end of each divided leaf.

Swainsona recta occurs in the grassy understorey of woodlands and open-forests dominated by Blakely's Red Gum (*Eucalyptus blakelyi*), Yellow Box (*E. melliodora*), Candle bark Gum (*E. rubida*) and Long-leaf Box (*E. goniocalyx*). It has been historically recorded in Carcoar, Culcairn and Wagga Wagga, where it is likely now extinct. Populations still exist in the Queanbeyan and Wellington-Mudgee areas, with over 80% of the southern population growing on a railway easement (DEH, 2025).

B3.12.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

A summary of the relevant Commonwealth guidelines and policy statements available for this species is:

- Conservation advice: "Conservation Advice for *Swainsona recta* (Small Purple-pea)" (DCCEEW, 2023), in effect under the EPBC Act from 31-Aug-2023
- Adopted/made recovery plan: "National Recovery Plan for Small Purple-pea (*Swainsona Recta*)" (OEH, 2012), in effect under the EPBC Act from 19-Sep-2012.

B3.12.3 Specific impacts

Swainsona recta has not been recorded within the Indicative disturbance footprint, however, is assumed present based on the presence of suitable habitat and associated PCTs within the Inland Slopes IBRA subregion. The following associated PCTs have been mapped or recorded within the Indicative disturbance footprint:

- PCT 266 – White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
- PCT 277 – Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion.

For the purpose of this assessment, the species has been assumed present within associated habitats in the Indicative disturbance footprint. The amended project is expected to impact on 0.62 ha of assumed habitat for *Swainsona recta*.

Table B.20 identifies the sections of the Revised BDAR where key information relating to the assessment and management of this species is presented.

Table B.20 Reference to relevant sections of the Revised BDAR for *Swainsona recta*.

Relevant section of the Revised BDAR
Methodology and survey effort – sections 2.3, 2.5 and 5.4
Habitat Information – sections 5.1.2, 5.2 and 5.3
Impacts – sections 9.1.5, 11.1.2 and Chapter 12
Avoidance and Minimisation Measures – Chapter 8
Figures – Chapter 15

B3.12.4 Significant impact criteria

An action is likely to have a significant impact on Endangered species if there is a real chance or possibility that it will:

- *lead to a long-term decrease in the size of a population*

All identified populations are identified as important to the conservation of the *Swainsona recta*. However, given the small amount of habitat (0.62 ha of assumed habitat) and the lack of records within the Indicative disturbance footprint, the amended project is unlikely to lead to a long-term decrease in the size of a population.

- *reduce the area of occupancy of the species*

Swainsona recta is known to occur in several locations in NSW, with a combined area of occupancy of about 34 ha (DCCEEW, 2023). Given the species was not recorded within the Indicative disturbance footprint it is unlikely to significantly reduce the area of known occupancy for this species.

- *fragment an existing important population into two or more populations*

Swainsona recta is known to be highly fragmented due to pasture improvement and other agricultural pressures, resulting in small, isolated populations of this species. Large-scale clearing in the past has been identified as a threat to the species, however mitigation measures including micro-sited towers would be implemented to minimise impacts.

Given the already highly fragmented populations of this species and the small amount of impact to assumed habitat, the amended project is unlikely to fragment an existing population into two or more populations of *Swainsona recta*.

- *adversely affect habitat critical to the survival of a species*

The approved conservation advice for *Swainsona recta* states that, due to the small number of extant populations and limited area of occupancy, all occupied habitat is considered critical to the survival of the species.

Swainsona recta has not been recorded within the Indicative disturbance footprint, and only a small area of potential habitat (0.62 ha of assumed habitat) has been identified based on the presence of suitable vegetation and associated PCTs. As no occupied habitat occurs within the Indicative disturbance footprint, the amended project is not considered to represent habitat critical to the survival of the species. Therefore, the amended project is unlikely to adversely affect habitat critical to the survival of *Swainsona recta*.

- *disrupt the breeding cycle of a population*

Swainsona recta flowers in spring, peaking in a 2 to 3-week period during October, the seed ripens in December, and plants then die back to the perennial rootstock, until resprouting again the following autumn (DEH, 2025).

Given the small extent (0.62 ha of assumed habitat) and nature (i.e. micro-sited towers and transmission lines spanning large areas of habitat) of impacts to assumed habitat, and the lack of records in the Indicative disturbance footprint, the amended project is considered unlikely to present significant barriers to reproductive processes such as pollination, and as such would not be expected to disrupt the breeding cycle of a population.

- *modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

The amended project would impact on 0.62 ha of assumed habitat for *Swainsona recta*. Within the local area the mapped extent of this associated habitat is 1069 hectares. Given that the species has not been recorded within the Indicative disturbance footprint, the small extent of potential habitat to be impacted (0.06% of the extent of this habitat within the local area), the amended project is unlikely to modify, destroy, remove or isolate or decrease the availability of quality of habitat to the extent that the species is likely to decline.

- *result in invasive species that are harmful to an endangered species becoming established in the endangered species' habitat*

Weed invasion is an identified threat to *Swainsona recta*. Mitigation measures detailed in the Revised BDAR such as biosecurity protocols would be implemented to limit the spread of weeds during construction and operation. Given these measures, the amended project is unlikely to significantly contribute to the introduction or spread of invasive species.

- *introduce disease that may cause the species to decline*

There are no known diseases causing potential species decline to *Swainsona recta*.

- *interfere substantially with the recovery of the species*

A current recovery plan is required for *Swainsona recta*. The existing National Recovery Plan for Small Purple-pea (*Swainsona recta*) (OEH, 2012) outlines the following recovery actions required for the species:

- undertake additional survey in vicinity of recently recorded sites
- monitor all known sites
- weed control
- undertake ecological burns
- negotiate improved management and/or formal protection of sites
- continue research into the biological / ecological effects of fire (burning frequency and season of burning) on Small Purple-pea and its habitat
- investigate potential sites suitable for enrichment planting or re-establishment of Small Purple-pea populations and undertake translocation projects
- investigate genetic variation within and between surviving populations to identify source and target populations for translocation and restoration. Measure the effects of habitat fragmentation and reduced population size on the long-term viability of Small Purple-pea
- increase community awareness and involvement in the Small Purple-pea recovery effort.

The amended project would impact approximately 0.62 ha of assumed for *Swainsona recta*. However, no occupied habitat has been identified within the Indicative disturbance footprint, and potential threats would be managed through the implementation of mitigation measures consistent with the Revised BDAR, including minimising vegetation disturbance, weed and pest management, biosecurity controls, and appropriate site management during construction. In this context, the amended project is unlikely to substantially interfere with the recovery of the species.

B3.12.5 Conclusion

Swainsona recta was not recorded within the Indicative disturbance footprint during seasonal surveys. Despite this, where targeted surveys were not possible in areas of suitable habitat, the species has been assumed present and would impact on 0.62 ha of assumed habitat for the species. Given that the extent of habitat to be impacted is small in terms of habitat available in the broader landscape and is not expected to impact an important population, the amended project is unlikely to significantly impact on *Swainsona recta*.

B4. Threatened fauna

Appendix A of the SEARs identifies an initial list of EPBC Act listed threatened fauna species that may be impacted by the action. A review of this list, together with database searches (BioNet, BAM-C and PMST), identified 43 listed threatened fauna species previously recorded or predicted to occur in the broader locality.

Following consideration of habitat availability within the Indicative disturbance footprint, species ecology, and the outcomes of field surveys, 21 terrestrial threatened fauna species were assessed as having a moderate to high likelihood of occurrence, of which nine species were recorded during surveys (Table B.21).

Aquatic threatened fauna species have been assessed separately and are addressed in the Aquatic Assessment (Revised BDAR Appendix M). In addition, three species (Grey-headed Flying-fox, Pink-tailed Worm Lizard, and Grey Snake) were ruled out from further assessment in accordance with the screening outlined in section 4.3.

Significance assessments have been prepared in accordance with the *Matters of National Environmental Significance – Significant Impact Guidelines 1.1* (Department of the Environment Water Heritage and the Arts, 2013) for terrestrial threatened fauna species with a moderate or higher likelihood of occurrence that have potential to be impacted by the amended project.

Table B.21 Threatened fauna species considered for assessment

Scientific name	Common name	EPBC Act[1]	Likelihood of occurrence	Significant impact?
Amphibians				
Crinia sloanei	Sloane's Froglet	E	Moderate	N
Litoria raniformis	Growling Grass Frog, Southern Bell Frog	V	Recorded	Y
Birds				
Aphelocephala leucopsis	Southern Whiteface	V	Recorded	N
Botaurus poiciloptilus	Australasian Bittern	E	Moderate	N
Calidris acuminata	Sharp-tailed Sandpiper	V	Moderate	N
Climacteris picumnus victoriae	Brown Treecreeper (South-eastern)	V	Recorded	N
Falco hypoleucos	Grey Falcon	V	Recorded (BioNet)	N
Gallinago hardwickii	Latham's Snipe	V	Moderate	N
Grantiella picta	Painted Honeyeater	V	Recorded	N
Hirundapus caudacutus	White-throated Needletail	V	Moderate	N
Lathamus discolor	Swift Parrot	CE	Moderate	N
Lophochroa leadbeateri	Pink Cockatoo	E	Recorded	N
Melanodryas cucullata cucullata	Hooded-Robin (south-eastern)	E	Moderate	N
Neophema chrysostoma	Blue-winged Parrot	V	Recorded	N
Pedionomus torquatus	Plains-wanderer	CE	Recorded	N
Polytelis swainsonii	Superb Parrot	V	Recorded	N

Scientific name	Common name	EPBC Act[1]	Likelihood of occurrence	Significant impact?
Rostratula australis	Australian Painted Snipe	E	Moderate	N
Stagonopleura guttata	Diamond Firetail	V	High	N
Tringa nebularia	Common Greenshank	E	Moderate	N
Mammals				
Nyctophilus corbeni	Corben's Long-eared Bat	V	Moderate	N
Phascolarctos cinereus	Koala	E	Moderate	N

(1) Threat status under the EPBC Act: V = vulnerable, E = endangered, CE = critically endangered

B4.1 *Crinia sloanei* (Sloane's Froglet)

Sloane's Froglet is listed as endangered under the EPBC Act.

B4.1.1 Description

Sloane's Froglet is a small ground-dwelling frog which has been recorded from widely scattered sites in the floodplains of the Murray-Darling Basin, with the majority of records in the Darling Riverine Plains, NSW South Western Slopes and Riverina bioregions in New South Wales. It has not been recorded recently in the northern part of its range and has only been recorded infrequently in the southern part of its range in NSW. The low number of sites, low number of recorded individuals per site, and the low proportion of records of this species in regional surveys all indicate that a moderately low number of mature individuals exist.

Sloane's Froglet lives and breeds in temporary and permanent waterbodies including oxbows off creeks and rivers, farm dams, large and small natural wetlands, constructed frog ponds and temporary puddles. It prefers wetlands that contain riparian and aquatic vegetation. Most often it has been found in waterbodies that contain grasses and reeds that are of medium height and have small stem diameters, such as *Elymus repens* (couch), *Paspalum paspalodes* (water couch) or *Eleocharis acuta* (Common spikerush). Preferred breeding sites are shallow natural or constructed pools to 20 cm depth containing emergent vegetation.

B4.1.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

A summary of the relevant Commonwealth guidelines and policy statements considered in undertaking the assessment on Sloane's Froglet includes:

- Conservation advice: "Conservation Advice *Crinia sloanei* (Sloane's Froglet)" (Threatened Species Scientific Committee, 2019).

Table B.22 identifies the sections of the Revised BDAR where key information relating to the assessment and management of this species is presented.

Table B.22 Reference to relevant sections of the Revised BDAR for *Crinia sloanei*

Relevant section of the Revised BDAR
Methodology and survey effort – sections 2.3, 2.6 and 5.4.2
Habitat Information – sections 5.1.2, 5.2 and 5.3
Impacts – sections 9.1.5, 11.1.2 and Chapter 12
Avoidance and Minimisation Measures – Chapter 8
Figures – Chapter 15

B4.1.3 Specific impacts

Sloane's Froglet has not been recorded within the Indicative disturbance footprint but has been assumed as present in areas of suitable habitat in PCT 237 where targeted survey has not been conducted. An impact of 0.59 ha has therefore been assigned to Sloane's Froglet.

B4.1.4 Significant impact criteria

An action is likely to have a significant impact on an Endangered or Critically Endangered species if there is a real chance or possibility that it will:

- *lead to a long-term decrease in the size of a population*

There is currently insufficient information available to assess the population size of Sloane's Froglet. The approved conservation advice states that 95% of Sloane's Froglet records since 2000 have been in three stronghold areas: Albury – Thurgoona, Howlong and Corowa – Wahgunyah and Rutherglen. The Indicative disturbance footprint is located over 100 km from these populations and the closest BioNet record to the Indicative disturbance footprint is approximately 86 km away. It is possible that the Indicative disturbance footprint exists further north and west of the distribution of the species. Considering the above, it is highly unlikely that the removal of 0.59 hectares of assumed habitat outside of the core population of the species would lead to a long-term decrease in the size of a population of Sloane's Froglet.

- *reduce the area of occupancy of the species*

The area of occupancy, according to the approved conservation advice for the species, is thought to be less than 90 km^2. The distribution of the species has been restricted to two known locations: near Albury and Cowra, and within a series of disjunct populations at Wangaratta, Chiltern, Little Lake Charm and Moodies Swamp near Cobram. The amended project is unlikely to result in a significant reduction in the area of occupancy of the species, as it would affect approximately 0.59 ha of assumed habitat, representing less than 0.012% of the species' total area of occupancy.

- *fragment an existing population into two or more populations*

Considering the species' is only assumed to be present within the Indicative disturbance footprint, the distance from known populations, and the small area of assumed habitat affected (0.59 ha), it is unlikely the amended project would fragment an existing population into two or more populations. In addition, impacts to riparian and wetland habitats would be minimised through micro-siting of infrastructure, implementation of riparian management measures, and progressive rehabilitation of disturbed areas, further reducing the potential for population fragmentation.

- *adversely affect habitat critical to the survival of a species*

Habitat critical to the survival of the species has not been identified within the approved conservation advice. Habitat critical to the survival of a species also refers to areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal
- for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)
- to maintain genetic diversity and long-term evolutionary development, or
- for the reintroduction of populations or recovery of the species or ecological community.

There are no records of the species within 80 km of the Indicative disturbance footprint, and the vast majority (96%) of records since 2000 occur within known populations located more than 100 km away. In this context, habitat within the Indicative disturbance footprint is unlikely to be critical to the survival of Sloane's Froglet for any of the reasons outlined above. Accordingly, the removal of 0.59 ha of assumed habitat is not considered likely to adversely affect habitat critical to the survival of the species.

- *disrupt the breeding cycle of a population*

Sloane's Froglet breeds in shallow waterbodies with grasses and reeds, where eggs are laid on emergent vegetation. Like most amphibians, the species also relies on temporary wet conditions to move between breeding and refuge areas, using features such as drains, channels and inundated grasslands.

Habitat within the Indicative disturbance footprint is considered limited due to the absence of connected pools with suitable vegetation. Given this, and the distance from known populations, the removal of 0.59 ha of assumed habitat is highly unlikely to disrupt the breeding cycle of a population.

- *modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

The amended project would result in the removal of 0.59 hectares of assumed habitat for Sloane's Froglet. There is approximately 502.60 hectares of this PCT within the local area (10 km buffer from the Indicative disturbance footprint). As such the amended project would remove 0.12% of the extent of this habitat within the local area. Considering the minor extent of potential habitat to be removed by the amended project and the lack of existing records within and in close proximity to the Indicative disturbance footprint, it is highly unlikely that the amended project would modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.

- *result in invasive species that are harmful to an endangered species becoming established in the endangered species' habitat*

Impacts of invasive species on Sloane's Froglet are primarily associated with habitat disturbance and direct mortality, particularly from feral pigs. The amended project occurs largely within an agricultural landscape where weeds and pest species are already present. Construction activities would incorporate on-ground mitigation measures to minimise the introduction or spread of invasive species, including vehicle and equipment hygiene controls, weed hygiene procedures during vegetation clearing, and rehabilitation of disturbed riparian areas to stabilise soils and limit weed establishment. In this context, the amended project is unlikely to significantly increase the presence or spread of invasive species, such as feral pigs or weeds, beyond existing levels within the landscape.

- *introduce disease that may cause the species to decline*

Chytridiomycosis is an infectious disease caused by the amphibian chytrid fungus which is known to infect Sloane's Froglet. Mitigation measures would be implemented as part of the amended project works, including wash down areas and hygiene protocols to prevent contamination and minimising the spread of disease. As such, it is considered unlikely the amended project would introduce disease or increase the prevalence of current diseases which may cause the species to decline.

- *interfere with the recovery of the species*

There is currently no recovery plan in place for Sloane's Froglet. The approved conservation advice for the species lists conservation and management priorities including:

- ensuring suitable habitat is maintained and protected in areas supporting extant Sloane's Froglet populations
- minimising the spread of the amphibian chytrid fungus
- managing priority sites to reduce impacts of habitat destruction by feral species or livestock.

Given that known populations of Sloane's Froglet occur a considerable distance from the Indicative disturbance footprint, the absence of records within the Indicative disturbance footprint, and the limited condition of the habitat proposed to be impacted, the removal of 0.59 ha of assumed habitat is not considered likely to interfere with the recovery of the species. In addition, the amended project would not increase the prevalence of feral species or livestock within the Indicative disturbance footprint, and hygiene and disease-prevention measures implemented during construction would minimise the risk of chytrid spread.

B4.1.5 Conclusion

Sloane's Froglet has not been recorded within the Indicative disturbance footprint and has been conservatively assumed to be present within 0.59 ha of potential habitat due to the absence of targeted surveys in these areas. Known populations of the species are largely restricted to locations more than 100 km from suitable habitat within the Indicative disturbance footprint, and the Indicative disturbance footprint may fall outside the current distribution of the species. While the species has been included in this assessment as a precautionary measure, consideration of the significance criteria indicates that the amended project is unlikely to result in a significant impact on Sloane's Froglet.

B4.2 *Litoria raniformis* (Southern Bell Frog)

The Southern Bell Frog is listed as a vulnerable species under the EPBC Act.

B4.2.1 Description

Southern Bell Frog is one of the largest frog species in Australia. Historically recorded across a wide range of south-east Australia, this species' current range within NSW and the ACT is centred on the Murray and Murrumbidgee River valleys and their tributaries. Preferred habitat includes emergent vegetation in or at the edges of still slow-flowing water bodies such as swamps, lakes and farm dams. It is known to float in warmer waters between 18–25°C. Additionally, it is known to occur on well-watered sandy soils or clays, open grassland, open forest, and ephemeral or permanent non-saline swamps and marshes.

Breeding occurs during the warmer months and is triggered by flooding or a significant rise in water levels. The species has been known to breed any time from early spring through to late summer/early autumn (Sept to April) following a rise in water levels.

B4.2.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

A summary of the relevant Commonwealth guidelines and policy statements considered in undertaking the assessment on the Southern Bell Frog include:

- Conservation advice: "Approved Conservation Advice for *Litoria raniformis* (southern bell frog)" (DEWHA 2024), in effect under the EPBC Act from 20-Aug-2024.
- Adopted/made recovery plan: "National Recovery Plan for the Southern Bell Frog *Litoria raniformis"* (Clemann and Gillespie, 2012)
- Threat abatement plans:
  - "Threat abatement plan for predation by feral cats 2024." {Commonwealth DCCEEW, 2024 #4656}. In effect under the EPBC Act from 24-Dec-2024.
  - "Threat abatement plan for infection of amphibians with chytrid fungus resulting in chytridiomycosis (2016)." {Commonwealth of Australia, 2016 #3369}. In effect under the EPBC Act from 07-Sep-2016.

Additional resources reviewed as part of this assessment include:

- The "Background Paper to the EPBC Act Policy Statement 3.14: Significant Impact Guidelines for the vulnerable growling grass frog (*Litoria raniformis*)" (Department of the Environment Water Heritage and the Arts, 2009a).
- The "EPBC Act Policy Statement 3.14: Significant impact guidelines for the vulnerable growling grass frog *(Litoria raniformis)"* (Department of the Environment Water Heritage and the Arts, 2009b)
- "Survey Guidelines for Australia's Threatened Frogs. EPBC Act survey guidelines 6.3" (Department of the Environment Water Heritage and the Arts, 2010c).

Table B.23 identifies the sections of the Revised BDAR where key information relating to the assessment and management of this species is presented.

Table B.23 Reference to relevant sections of the Revised BDAR for *Litoria raniformis*

Relevant section of the Revised BDAR
Methodology and survey effort – sections 2.3, 2.6 and 5.4.2
Habitat Information – sections 5.1.2, 5.2, 5.3 and 5.3.13
Impacts – sections 9.1.5, 11.1.2 and Chapter 12
Avoidance and Minimisation Measures – Chapter 8
Figures – Chapter 15

B4.2.3 Specific impacts

Southern Bell Frog has been recorded within the Indicative disturbance footprint with 34.63 ha (16.1 ha of confirmed and 18.53 ha of assumed) of habitat in the form of associated PCTs 7, 10, 11, 13, 17, 24 and 53. Within the Indicative disturbance footprint (and in habitats which are within close proximity and connected to the Indicative disturbance footprint), Southern Bell Frog was recorded both audially and visually in the western section of the project, almost exclusively within the Murray Fans IBRA subregion, aside from one location within the Murrumbidgee IBRA subregion. Individuals were recorded during targeted spotlighting and call playback surveys, in addition to incidentally. Individuals were mostly associated with water bodies and associated vegetation around rivers, farm dams, billabongs, and irrigation channels. Almost all water bodies surveyed, irrespective of size, were found to host the species during surveys during 2024–2025, following heavy rain events in the preceding month. Breeding was also observed in one incidence in January 2025, where tadpoles were recorded, in addition to adults in a billabong, approximately 8.5 kilometres north of the intersection between the amended project and Noorong Road.

B4.2.4 Is this part of an important population?

In accordance with the *Matters of National Environmental Significance - Significant Impact Guidelines 1.1* (Department of the Environment Water Heritage and the Arts, 2013), the presence of an important population must be identified prior to addressing the significant impact criteria. An important population is defined in the Significant Impact Guidelines as a population that is necessary for a species' long-term survival and recovery. Under the Act, important populations are:

- likely to be key source populations either for breeding or dispersal
- likely to be necessary for maintaining genetic diversity
- at or near the limit of the species range.

Scattered records of the species exist within the indicative disturbance footprint and the broader locality (Department of Planning Industry and Environment, 2021a). Any breeding population in NSW would be likely be considered important for breeding and maintaining genetic diversity. Therefore, the population subject to this assessment is part of an important population given the limited range and the fragility of the species.

B4.2.5 Significant impact criteria

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

- *lead to a long-term decrease in the size of an important population of a species*

Habitat for the species occurs within the Indicative disturbance footprint in the form of associated PCTs and water bodies and associated vegetation around rivers, farm dams, billabongs, and irrigation channels.

Impacts to retained riparian and wetland habitats would be minimised where possible through micro-siting of infrastructure, avoidance of in-water works where possible, implementation of vegetation clearing controls to limit disturbance to the canopy layer, and progressive stabilisation and rehabilitation of disturbed riparian areas to maintain habitat function and connectivity. However, given the isolation of current known populations within the species distribution and the presence of suitable permanent water bodies and breeding habitat within the amended project footprint, it is possible that direct impacts to currently occupied habitat could lead to a long-term decrease in the size of an important population of the species.

- *reduce the area of occupancy of an important population*

The Indicative disturbance footprint encompasses part of the northern extent of the known distribution of the Southern Bell Frog, which is largely associated with the Murray River and the mid-lower Murrumbidgee floodplain. The amended project will impact 16.10 ha of confirmed habitat and 18.53 ha of assumed habitat within this distribution. Given this, it is likely the amended project will reduce the area of occupancy of an important population of the species.

- *fragment an existing important population into two or more populations*

Records of this species exist at a number of locations within the Indicative disturbance footprint and the broader locality, within the vicinity of large water bodies and rivers. The species was recorded in almost all water bodies surveyed, irrespective of size during surveys during 2024–2025, following heavy rain events in the preceding month. The amended project is likely to impact 34.63 ha of both confirmed and assumed habitat including occupied habitat and will transect areas of vegetation and aquatic areas where the species occurs. Disturbance to aquatic areas will be avoided where possible, however considering the linear nature of impacts it is possible that the amended project could fragment an important population.

- *adversely affect habitat critical to the survival of a species*

Habitat critical to the survival of a species refers to areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal
- for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)
- to maintain genetic diversity and long-term evolutionary development, or
- for the reintroduction of populations or recovery of the species or ecological community. (Department of the Environment Water Heritage and the Arts, 2013).

No Critical Habitat as defined under section 207A of the EPBC Act has been identified or included in the Register of Critical Habitat for this species. Habitat likely to be critical for survival is listed in the conservation advice for the species and includes a matrix of aquatic and terrestrial habitat for breeding, foraging, shelter, and dispersal, with the species typically occurring in landscapes with both permanent and seasonally flooded waterbodies. The Indicative disturbance footprint contains habitat suitable for the Southern Bell Frog; and the species was recorded in a number of locations both within the Indicative disturbance footprint and surrounding locality. Further, breeding activity was recorded in close proximity to the Indicative disturbance footprint. Considering this and taking a precautionary approach, it is possible that amended project contains habitat critical to the survival of the species.

— *disrupt the breeding cycle of an important population*

Southern Bell Frogs generally breed between November and March, following local flooding and a marked rise in water levels from rain, which triggers calling in breeding males. Breeding usually occurs in still or slow-moving water. Most breeding sites located in recent surveys in NSW are overflow areas, for example, billabongs or levee swamps. Breeding was observed during surveys in one incidence in January 2025, where tadpoles were recorded, in addition to adults in a billabong, approximately 8.5 kilometres north of the intersection between the amended project and Noorong Road.

No overflow areas would be directly impacted by the amended project; therefore, it is considered unlikely that the amended project would disrupt the breeding cycle of any important population of the species. Mitigation measures, such as sediment, erosion and hygiene controls including wash down protocols would be implemented to minimise indirect impacts on the species habitat which could impact breeding success.

— *modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

The Indicative disturbance footprint provides habitat for this species. The amended project would result in the removal of 34.63 hectares of habitat including 16.1 ha of confirmed habitat and 18.53 ha of assumed habitat. Southern Bell Frog was recorded both audially and visually in the western section of the project, including both the Murray Fans IBRA subregion and the Murrumbidgee IBRA subregion. The species extensively recorded in water bodies surveyed, irrespective of size during 2024–2025, following heavy rain events in the preceding month. Given the extent of records and habitat and the direct impact to habitat within the Indicative disturbance footprint, it is possible the amended project would result in the modification, removal, isolation, or decreased availability or quality of habitat to the extent that the species is likely to decline.

— *result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat*

Southern Bell Frog is susceptible to predation by Plague Minnow (*Gambusia holbrooki*). The amended project would involve in-water works with potential to introduce the Plague Minnow during works associated with instream access track upgrades and while using watercraft to string transmission lines. However, mitigation measure have been provided to reduce the potential introduction of this species which are presented in Chapter 8 and Appendix M of the Revised BDAR.

The amended project occurs largely within an agricultural landscape where weeds and pest species are already present. During construction, on-ground mitigation measures would be implemented to minimise indirect impacts to retained aquatic and riparian habitats, including vehicle and equipment hygiene, biosecurity controls, and progressive stabilisation and rehabilitation of disturbed riparian areas to reduce habitat degradation. In this context, the amended project is unlikely to significantly increase the risk of invasive species impacts, including exotic fish, weeds or pests, on Southern Bell Frog beyond existing landscape conditions.

— *introduce disease that may cause the species to decline*

This species is susceptible to Amphibian Chytrid Fungus (*Batrachochytrium dendrobatidis*), which has been identified as the cause of population decline for this species and many others along the eastern ranges. Mitigation measures would be implemented as part of the amended project works, including wash down areas and hygiene protocols, to prevent contamination and minimise the spread of disease.

- *interfere substantially with the recovery of the species*

The *National Recovery Plan for the Southern Bell Frog Litoria raniformis* (Clemann and Gillespie, 2012) outlines the following specific objectives for recovery of the Southern Bell Frog:

- secure extant populations of Southern Bell Frogs, particularly those occurring in known breeding habitats, and improve their viability through increases in size and/or area of occurrence
- determine distribution, biology and ecology of the Southern Bell Frog, and identify causes of the decline of the species across its geographic range
- address known or predicted threatening processes and implement appropriate management practices where possible to ensure that land use activities do not threaten the survival of the Southern Bell Frog
- increase community awareness of and support for Southern Bell Frog conservation.

The amended project will directly impact on habitat for the species including occupied habitat and consequently may interfere with the listed recovery objectives.

B4.2.6 Conclusion

Southern Bell Frog has been recorded within the Indicative disturbance footprint and at multiple locations within the broader locality. The Indicative disturbance footprint contains associated PCTs and potential habitat in the form of lakes, swamps and rivers. The amended project is likely to impact 34.63 hectares of habitat including 16.1 ha of confirmed habitat and 18.53 of assumed habitat. Mitigation measures would be implemented to minimise indirect impacts on retained habitat, however it is possible the amended project will impact on habitat critical to survival, reduce the area of occupancy and interfere with the recovery of the species. Accordingly, the amended project is likely to result in a significant residual impact to Southern Bell Frog.

B4.3 *Aphelocephala leucopsis* (Southern Whiteface)

Southern Whiteface is listed as vulnerable under the EPBC Act.

B4.3.1 Description

The Southern Whiteface is a small, thornbill-like bird that occurs in a large distribution across most of mainland Australia south of the tropics, from the north-eastern edge of the Western Australian wheatbelt, east to the dividing range (DCCEEW, 2023). The preferred habitat includes a wide range of open woodlands and shrublands with an understory consisting of predominantly grasses and shrubs. Such areas usually include acacia or eucalyptus on ranges foothills and lowlands. This coincides with a foraging habitat for the Southern Whiteface to be exclusively on the ground, favouring habitats with herbaceous understories and low tree density.

B4.3.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

The relevant Commonwealth guidelines and policy statements available for this species includes:

- Conservation advice: "Approved Conservation Advice for *Aphelocephala leucopsis* (Southern whiteface)". (DEWHA 2023), in effect under the EPBC Act from 31-Mar-2023.
- Threat abatement plans: "Threat abatement plan for predation by feral cats 2024." {Commonwealth DCCEEW, 2024 #4656}. In effect under the EPBC Act from 24-Dec-2024.

Table B.24 identifies the sections of the Revised BDAR where key information relating to the assessment and management of this species is presented.

Table B.24 Reference to relevant sections of the Revised BDAR for *Aphelocephala leucopsis*

Relevant section of the Revised BDAR
Methodology and survey effort – sections 2.3, 2.6 and 5.4.3
Habitat Information – sections 5.1.1 and 5.2
Impacts – sections 9.1.1, 11.1.1 and Chapter 12
Avoidance and Minimisation Measures – Chapter 8
Figures – Chapter 15

B4.3.3 Specific impacts

Southern Whiteface has been recorded within Indicative disturbance footprint and broader locale, with potential habitat in the form of associated PCTs 7, 10, 11, 13, 15, 17, 20, 23, 24, 26, 28, 44, 45, 46, 58, 157, 159, 160, 163, 164, 170, 216, 237, 266 & 277. The amended project would result in the loss of 1,251.47 ha of habitat for this species.

B4.3.4 Is this part of an important population?

In accordance with the *Matters of National Environmental Significance - Significant Impact Guidelines 1.1* (Department of the Environment Water Heritage and the Arts, 2013), the presence of an important population must be identified prior to addressing the significance impact criteria. An important population is defined in the Significant Impact Guidelines as a population that is necessary for a species' long-term survival and recovery. Under the EPBC Act, important populations are:

- likely to be key source populations either for breeding or dispersal
- likely to be necessary for maintaining genetic diversity
- at or near the limit of the species range.

The Southern Whiteface has extensive distribution across mainland Australia in a range of woodland and shrubland habitats. The species was recorded in the Indicative disturbance footprint and is also known to occur in the locality. The species habitat within the Indicative disturbance footprint is unlikely to represent an important population for the Southern Whiteface for the following reasons:

- it is well represented within the local area (515 998.75 ha of associated habitat occurring within 10 km of the Indicative disturbance footprint, resulting in the loss of 0.24% of potential species habitat)
- is not considered to be at the limit of the species distribution, and
- given the range of the species, it is unlikely the habitat within the Indicative disturbance footprint would be considered necessary for maintaining a species genetic diversity or a key source population for breeding.

B4.3.5 Significant impact criteria

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

- *lead to a long-term decrease in the size of an important population*

The amended project is unlikely to lead to a long-term decrease in an important population, as the species is not considered to represent an important population within the Indicative disturbance footprint. In addition, further habitat for the species is well represented within the Indicative disturbance footprint and surrounding locality with 515,998.75 ha of associated habitat occurring within the local area.

- *reduce the area of occupancy of an important population*

The amended project is unlikely to reduce the area of occupancy of an important population, as the species is not considered to represent an important population within the Indicative disturbance footprint. In addition, the estimated area of occupancy for the Southern Whiteface is 80,000 km^{-2}, habitat to be removed within the Indicative disturbance footprint only represents 0.02% of the area of occupancy for the Southern Whiteface.

- *fragment an existing important population into two or more populations*

The Southern Whiteface is not considered an important population within the Indicative disturbance footprint. Therefore, it is unlikely the amended project would fragment an existing important population into two or more populations. In addition, given the nature of the amended project it is unlikely the amended project would create a barrier to the species movement.

- *adversely affect habitat critical to the survival of a species*

No Critical Habitat has been identified for this species under section 207A of the EPBC Act or listed on the Register of Critical Habitat. The approved conservation advice identifies habitat critical to the survival of the Southern Whiteface as relatively undisturbed open woodlands and shrublands with a grassy or shrubby understorey, low tree densities with herbaceous ground cover for foraging, and the presence of living or dead trees with hollows or crevices for nesting and roosting.

While elements of suitable habitat for the species occur within the Indicative disturbance footprint, this habitat forms part of a broader and extensive availability of similar habitat within the locality and region. The amended project would not substantially reduce the extent, quality or functionality of this habitat, nor affect key habitat features required for foraging, nesting or roosting. In this context, habitat within the Indicative disturbance footprint is not considered critical to the survival of the species, and the amended project is unlikely to adversely affect habitat critical to the survival of the Southern Whiteface.

- *disrupt the breeding cycle of an important population*

The amended project is unlikely to disrupt the breeding cycle of an important population, as the species is not considered to represent an important population within the Indicative disturbance footprint.

- *modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

The amended project occurs largely within an agricultural landscape containing existing weeds and pests and would result in a localised loss of habitat for the species. However, the affected habitat represents a very small proportion of the available habitat, with approximately 515,998.75 ha of associated habitat occurring within the surrounding locality. In this context, the amended project is unlikely to modify, destroy, remove, isolate, or reduce the availability or quality of habitat to an extent that would result in a decline of the species.

- *result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat*

Invasive species that may prey on or degrade habitat for the Southern Whiteface include rabbits, cats and foxes, which are already present within the agricultural landscape due to historical land use. The amended project would not introduce new pathways for invasive species; however, on-ground mitigation measures would be implemented to minimise indirect impacts on retained habitat. These include micro-siting of infrastructure to avoid higher-quality habitat, limiting vegetation clearing to the tree canopy where practicable, vehicle and equipment hygiene controls, and progressive stabilisation and rehabilitation of disturbed areas, particularly within riparian and woodland environments. In this context, the amended project is unlikely to exacerbate invasive species impacts on Southern Whiteface habitat beyond existing landscape condition.

- *introduce disease that may cause the species to decline*

There are no known diseases causing potential species decline to the Southern Whiteface.

- *interfere substantially with the recovery of the species*

There is no adopted or made recovery plan for the Southern Whiteface, the species approved conservation advice sets out several actions for the conservation and recovery of the species, including ceasing clearing of habitat critical to the survival of the species. The amended project would not result in the loss of habitat critical to the survival of the species. Further, this represents 0.24% of the available habitat within the Indicative disturbance footprint with further habitat available in locality. Therefore, it is unlikely the amended project would substantially interfere with the recovery of the species.

B4.3.6 Conclusion

Based on the assessment above, it is unlikely the amended project would have a significant residual impact on the Southern Whiteface.

B4.4 *Botaurus poiciloptilus* (Australasian Bittern)

The Australasian Bittern is listed as endangered under both the EPBC Act and the BC Act.

B4.4.1 Description

The Australasian Bittern is a heron-like bird, that occurs in Australia, New Zealand and New Caledonia. In Australia, they occur from south-east Queensland to south-east Australia, Tasmania and the south-west of Western Australia. The Australian population size is estimated at between 250 and 800 individuals (2010 data).

Preferred habitat includes wetlands with tall vegetation, including permanent and seasonal freshwater habitats dominated by sedges, rushes, reeds, or cutting grass are preferred, with species such as *Phragmites, Cyperus, Eleocharis, Juncus, Typha, Baumea, Bolboschoenus, and Gahnia* growing over a muddy or peaty substrate (Threatened Species Scientific Committee, 2011). The Australasian Bittern forages in still, shallow water up to 0.3 metres deep, often at the edges of pools or waterways, or from platforms or mats of vegetation over deep water (Threatened Species Scientific Committee, 2011). This species is cryptic and primarily solitary and sedentary, occasionally dispersing nocturnally. Solitary pairs breed in deep, densely vegetated swamps, building a nest just above the water level typically in shrubs standing in water within screening reeds (Morcombe *et al.,* 2011).

B4.4.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

A summary of the relevant Commonwealth guidelines and policy statements available for this species is as follows:

- Conservation advice: "Approved Conservation Advice *Botaurus poiciloptilus* Australasian Bittern*"* (Threatened Species Scientific Committee, 2019a) was reviewed as part of this assessment.
- Listing advice: "Commonwealth Listing Advice on *Botaurus poiciloptilus* (Australasian Bittern)" (Threatened Species Scientific Committee, 2011) provides a similar habitat description that was reviewed as part of this assessment.
- Adopted/made recovery plan: "National Recovery Plan for the Australasian Bittern (*Botaurus poiciloptilus*)" (Department of Climate Change, Energy, the Environment and Water 2022) in effect under the EPBC Act from 24-Feb-2023.
- Threat abatement plans:
  - "Threat abatement plan for predation by feral cats" {Commonwealth DCCEEW, 2024 #4656}.
  - "Threat abatement plan for predation by the European red fox" (Department of the Environment Water Heritage and the Arts, 2008).

Additional resources reviewed:

- "Survey Guidelines for Australia's Threatened Birds" (Department of the Environment Water Heritage and the Arts, 2010a).

Table B.25 identifies the sections of the Revised BDAR where key information relating to the assessment and management of this species is presented.

Table B.25 Reference to relevant sections of the Revised BDAR for *Botaurus poiciloptilus*

Relevant section of the Revised BDAR
Methodology and survey effort – sections 2.3, 2.6 and 5.4.3
Habitat Information – sections 5.1.1 and 5.2
Impacts – sections 9.1.1, 11.1.1 and Chapter 12
Avoidance and Minimisation Measures – Chapter 8
Figures – Chapter 15

B4.4.3 Specific impacts

Australasian Bittern have been recorded within the amended project's broader locale, with 249.4 ha of habitat associated PCTs within the Indicative disturbance footprint including PCTs 10, 11, 13, 17, 24 & 160. The majority of wetland habitats associated with the Indicative disturbance footprint are unlikely to be used for breeding purposes; however, Australasian Bitterns may occasionally use those wetlands during migratory movements when they hold water.

There is also a risk of powerline strike, as north south movements through the region have been recorded in recent years through satellite tracking studies. The species has been identified as high risk for powerline strikes, based on flight elevation and local movements. However, mitigation measures are to be implemented to reduce such risk. Mitigation measures include the installation of bird diverters as a form of conductor line-marking to reduce bird strike risk during construction phase and early operation phases. Further, the location of diverters would be focused on areas within one kilometre of wetland/riverine habitats, reducing the species strike risk when using wetlands during migratory movements.

Thus, due to the infrequency of the species movements through the greater area, and extensive risk mitigation, the amended project is unlikely to have a significant impact on existing populations within the locality. However, this assessment has been completed as a precautionary measure as the species has the potential to use habitat within the wider locale.

B4.4.4 Significant impact criteria

An action is likely to have a significant impact on an Endangered or Critically Endangered species if there is a real chance or possibility that it will:

- *lead to a long-term decrease in the size of a population*

The *Action Plan for Australian Birds 2010* (Garnett *et al*. 2011) suggested there were less than 1,000 mature Australasian Bitterns within the Australian population, and that the population was likely declining. The species was not recorded within the Indicative disturbance footprint despite targeted ecological surveys.

Aquatic habitats most likely to support the species are unlikely to be directly impacted by the amended project, with impacts generally limited to localised trimming or removal of tree canopy along riverbanks. However, where the species habitat occurs within areas of access track upgrades, direct impacts to the waterway may occur but these impacts are generally considered to be minor compared to overall habitat availability within the locality.

While intermittent north–south movements have been recorded and the species may therefore be exposed to some risk of powerline strike during flight, these movements are infrequent within the region. As such, the amended project is unlikely to affect the population at a scale that would result in a long-term decrease.

To further minimise collision risk, conductor line-marking measures, including bird diverters, would be incorporated during design refinement. These measures would be prioritised within one kilometre of wetland and riverine habitats, reducing the likelihood of bird strike and facilitating safer passage for aerial fauna.

- *reduce the area of occupancy of the species*

The area of occupancy for Australasian Bittern is estimated to be approximately 1,150 km^2, which equates to an area of 115,000 hectares. Direct impact to waterbodies or adjacent riparian habitats likely to be used by the species would generally occur as the removal or trimming of tree canopy on riverbanks to facilitate the construction and operation of the powerlines spanning riparian areas. Some minor in-stream works will occur in association with access track upgrades but are temporary and considered minor compared to the overall availability of habitat within the broader locality. Given the species mobility and extent of habitat within the Indicative disturbance footprint, it is unlikely the amended project would reduce an area of occupancy for the species.

- *fragment an existing population into two or more populations*

The Australasian Bittern population can be divided into two subpopulations, the south–eastern and south–western subpopulations. This species is highly mobile and capable of long-distance flight across other habitats to move between suitable wetland habitats. The transmission lines may create a barrier to movement for the species.

Mitigation measure to reduce risk of collision and maintain landscape connectivity for avian species. Will be incorporated into the amended project design. These measures include

- conductor line-marking techniques and bird diverters to alleviate the risk of bird strike with powerlines. Positioning and exact diverter model would be finalised during design refinement and would be developed as part of a Connectivity Strategy. At minimum these would be used within one kilometre of wetland/riverine habitats to reduce impacts on aerial fauna species from collision and allow safer passage within these areas
- connectivity corridors involving native vegetation retention up to the 10 metre or 20 metre (for 330 kV and 500 kV lines, respectively) wide temporary construction centreline clearing zone to better facilitate woodland connectivity. Vegetation heights to be retained would be determined in accordance with vegetation clearing requirements at each location.

- *adversely affect habitat critical to the survival of a species*

The approved conservation advice states that as a guide, habitat critical to the survival of the Australasian Bittern can be considered to include any natural wetland habitat where the species is known or likely to occur (breeding or foraging habitat) within the indicative distribution map.

Both permanent and temporary waterbodies exist within the Indicative disturbance footprint, which may be used by the species. Therefore, the habitat within the Indicative disturbance footprint is likely to represent habitat critical to the survival of the species. However, direct impact to waterbodies or adjacent riparian habitats would be generally limited to the removal or trimming of tree canopy on riverbanks to facilitate the construction and operation of the powerlines spanning riparian areas. Minor in-stream work will be required for access track upgrades but will be temporary and is minor compared to the overall available habitat within the locality. Any potential indirect impacts to these habitats would be managed through mitigation measures. Consequently, it is unlikely that the amended project would adversely affect habitat critical to the survival of the species.

- *disrupt the breeding cycle of a population*

Australasian Bittern breeds in densely vegetated freshwater wetlands, constructing nests within dense cover over shallow water. The species was not recorded during targeted ecological surveys, and no evidence of breeding or nesting habitat was identified within the Indicative disturbance footprint.

Aquatic habitats most likely to support breeding are unlikely to be directly impacted by the amended project, with impacts generally limited to localised trimming or removal of riparian tree canopy where transmission lines span waterways. Some in-stream works will be required in areas of access track upgrades but are temporary and minor compared to overall habitat available within the locality. While the species may undertake intermittent migratory movements, these are infrequent within the region. In addition, conductor line-marking and bird diverters would be implemented during design refinement, particularly within one kilometre of wetland and riverine habitats, to reduce collision risk and facilitate safe movement.

Accordingly, the amended project is unlikely to disrupt the breeding cycle of the Australasian Bittern.

- *modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

Aquatic habitats most likely to support breeding are unlikely to be directly impacted by the amended project, with impacts generally limited to localised trimming or removal of riparian tree canopy where transmission lines span waterways. Some in-stream works will be required in areas of access track upgrades but are temporary and minor compared to overall habitat available within the locality. Therefore, the amended project is considered unlikely to result in the modification, removal, isolation, or decreased availability or quality of habitat to the extent that the species is likely to decline.

- *result in invasive species that are harmful to an endangered species becoming established in the endangered species' habitat*

Invasive species are present throughout the landscape, and it is considered unlikely that the amended project would substantially change the composition of the species' habitat within the landscape or increase the spread and establishment of invasive species (i.e. predators) that could threaten the survival of the species. As such the amended project is considered unlikely to result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat. In addition, mitigation measures such as hygiene protocols would be undertaken to minimise further invasive species from becoming established in the species habitat.

- *introduce disease that may cause the species to decline*

There are no known diseases causing potential species decline to the Australasian Bittern. Mitigation measures including weed and pathogen controls would be put in place for the amended project which would minimise the introduction of any potential diseases.

- *interfere substantially with the recovery of the species*

The National Recovery Plan for the Australasian Bittern (*Botaurus poiciloptilus*), Commonwealth of Australia 2022' sets out several strategies for the recovery of this species including:

- implement management actions that mitigate or reduce threats to Australasian Bittern and their habitat
- enhance the quality, extent and protection of suitable habitat for the Australasian Bittern
- undertake research and monitoring to improve knowledge of the biology, ecology and population trends of Australasian Bittern
- increase stakeholder participation in Australasian Bittern conservation and management
- coordinate, review and report on recovery progress.

It is unlikely the amended project would substantially interfere with any of these recovery objectives. Furthermore, the amended project does not occur within priority management areas for this species as outlined under the NSW Saving Our Species recovery strategy and would not directly impact the species habitat. Direct and indirect impacts would be controlled through mitigation measures. As such, the amended project is unlikely to substantially interfere with the recovery of the species.

B4.4.5 Conclusion

Aquatic habitats most likely to support the species are unlikely to be directly impacted by the amended project, with impacts generally limited to localised trimming or removal of riparian tree canopy where transmission lines span waterways. Some in-stream works will be required in areas of access track upgrades but are temporary and minor compared to overall habitat available within the locality. Noting the species extensive mobility and habitat within the surrounding locality, and region, it is unlikely this impact would significantly impact the species. The implementation of mitigation measures would further minimise impacts on the species habitat. Therefore, it is considered unlikely the amended project would result in a significant residual impact on the Australasian Bittern.

B4.5 Vulnerable listed woodland birds

B4.5.1 Woodland birds

The following three bird species have been grouped together as they have similar woodland habitat requirements and listing status:

- Brown Treecreeper (south-eastern) (*Climacteris picumnus victoriae*)
- Diamond Firetail (*Stagonopleura guttata*)
- Painted Honeyeater (*Grantiella picta*).

The Diamond Firetail is a large finch endemic to south-eastern Australia, extending from central Queensland to the Eyre Peninsula in South Australia Description. The species habitat includes grassy eucalypt woodlands, open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities.

The Brown Treecreeper is a grey-brown bird with a pale face and streaking on the lower breast and belly. The species is endemic to eastern Australia, occurring in eucalypt forests and woodlands or inland slopes and plains of the Great Dividing Range.

The Painted Honeyeater inhabits Boree/ Weeping Myall (*Acacia pendula*), Brigalow (*A. harpophylla*) and Box-Gum Woodlands and Box-Ironbark Forests. It is a specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias and prefers mistletoes of the genus *Amyema.*

B4.5.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

Relevant Commonwealth guidelines and policy statements that have been considered in this assessment include:

- Approved conservation advice:
  - Department of Climate Change, Energy, the Environment and Water (2023). “Conservation Advice for *Climacteris picumnus victoriae* (Brown Treecreeper (south-eastern))”. Canberra: Department of Climate Change, Energy, the Environment and Water, in effect under the EPBC Act from 31 March 2023.
  - Department of Climate Change, Energy, the Environment and Water (2023). “Conservation Advice for *Stagonopleura guttata* (Diamond Firetail)”. Canberra: Department of Climate Change, Energy, the Environment and Water, in effect under the EPBC Act from 31 March 2023.
  - Department of the Environment (2015). “Conservation Advice *Grantiella picta* (Painted Honeyeater)”. Canberra: Department of the Environment, in effect under the EPBC Act from 08 July 2015.
- Adopted/made recovery plan: Department of Agriculture, Water and the Environment (2021). “National Recovery Plan for the Painted Honeyeater (*Grantiella picta*)”. Department of Agriculture, Water and the Environment, Canberra, in effect under the EPBC Act from 16 June 2022.
- Threat Abatement Plan: “Threat abatement plan for predation by feral cats 2024” {Commonwealth DCCEEW, 2024 #4656}. Canberra: Commonwealth of Australia, in effect under the EPBC Act from 24 December 2024.

Table B.26 identifies the sections of the Revised BDAR where key information relating to the assessment and management of these species is presented.

Table B.26 Reference to relevant sections of the Revised BDAR for the three Vulnerable woodland birds

Relevant section of the Revised BDAR
Methodology and survey effort – sections 2.3, 2.6 and 5.4.3
Habitat Information – sections 5.1.1 and 5.2
Impacts – sections 9.1.1, 11.1.1 and Chapter 12
Avoidance and Minimisation Measures – Chapter 8
Figures – Chapter 15

B4.5.3 Specific impacts

Habitat for these woodland bird species occurs across the Indicative disturbance footprint and is widely distributed throughout the locality. Associated PCTs and impacts are shown in the table below.

Table B.27 Woodland bird habitat and impacts within the Indicative disturbance footprint

Woodland bird	Habitat within the Indicative disturbance footprint (associated PCTs)	Direct impact (clearing in ha)
Brown Treecreeper	PCTs 237, 266, 277 & 343.	3.33
Diamond Firetail	PCTs 7, 10, 11, 13, 20, 23, 26, 28, 44, 45, 46, 58, 86, 170, 237, 266, 277, 319 & 343.	648.17
Painted Honeyeater	PCTs 7, 10, 11, 13, 15, 20, 23, 26, 28, 58, 86, 237, 266, 277, 319 & 343.	382.52

B4.5.4 Is an important population likely to be present?

Under the Act, important populations are:

- likely to be key source populations either for breeding or dispersal.
- likely to be necessary for maintaining genetic diversity, and/or
- at or near the limit of the species range.

Based on the approved conservation advice and DCCEEW Species Profile and Threats Database for the Brown Treecreeper, Diamond Firetail, and Painted Honeyeater, populations of these woodland bird species occur across broad areas of south-eastern Australia and are not restricted to the Indicative disturbance footprint or its immediate locality. None of these species is identified in Commonwealth conservation advice or recovery plans as having a key source population for breeding or dispersal, or a population critical for maintaining genetic diversity, within the Indicative disturbance footprint.

In addition, the Indicative disturbance footprint does not occur at, or near, the known limits of the geographic range for any of these species. No important populations of the Brown Treecreeper, Diamond Firetail, or Painted Honeyeater are therefore considered to occur within the Indicative disturbance footprint.

B4.5.5 Significant impact criteria

Under the EPBC Act, an action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

- *lead to a long-term decrease in the size of an important population of a species*

No important populations of the woodland bird's species have been identified in the Indicative disturbance footprint. In addition, no important populations were identified in the approved conservation advice for each of the woodland bird species. Therefore, it is unlikely the amended project would lead to a long-term decrease in the size of an important population of Brown Treecreeper, Diamond Firetail, or Painted Honeyeater.

- *reduce the area of occupancy of an important population*

No important populations of Brown Treecreeper, Diamond Firetail, and Painted Honeyeater have been identified in the Indicative disturbance footprint. Therefore, it is unlikely the amended project would reduce the area of occupancy of an important population of these woodland bird species.

- *fragment an existing important population into two or more populations*

It is unlikely the amended project would fragment an existing important population into two or more populations, as no important populations of Brown Treecreeper, Diamond Firetail, and Painted Honeyeater are known to occur within the Indicative disturbance footprint.

- *adversely affect habitat critical to the survival of a species*

Habitat critical to the survival of a species also refers to areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal
- for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)
- to maintain genetic diversity and long-term evolutionary development, or
- for the reintroduction of populations or recovery of the species or ecological community.

Habitat critical to the survival of these species includes:

- **Brown treecreeper (south-eastern).** Areas that have a relatively undisturbed grassy woodland with native understorey. The habitat structure should be quite open at ground level so that birds are able to feed on or near the ground and maintain vigilance against predators. Living and dead trees are essential for roosting and nesting sites and fallen timber which provides essential foraging habitat. Habitat with hollows in standing dead or live trees and tree stumps are also essential for nesting.
- **Diamond firetail.** Identified areas of Eucalypt, acacia or casuarina woodlands, open forests, and other lightly timbered habitats, low tree density, few large logs, and little litter cover but high grass cover for foraging, roosting, and breeding. The approved conservation advice also states that any known or likely habitat identified in map 1 of the approved conservation advice should be considered habitat critical to the survival of the species. The Indicative disturbance footprint falls within the area mapped as known habitat, therefore could be considered habitat critical to the species.
- **Painted Honeyeater.** Known or likely breeding habitat in Boree/Weeping Myall (*Acacia pendula*), Brigalow (*A. harpophylla*) woodlands, box-gum woodlands, and box-ironbark forests on the inland slopes of the Great Dividing Range in New South Wales, Victoria, and southern Queensland. All preferred foraging species within known and likely foraging habitat particularly mistletoes of the genus *Amyema* growing on forest and woodland eucalypts and acacias. It is unlikely the Indicative disturbance footprint would provide habitat critical to the survival of the species.

The amended project would result in the loss of habitat critical for the survival of the Brown treecreeper and Diamond Firetail. However, given the habitat to be impacted is a minor fragment of the extent and available habitat in the local area (1782.77 ha for the Brown Treecreeper (south-eastern), 299,116.44 ha for the Diamond Firetail, and 105,473.58 ha for the Painted Honeyeater) it is unlikely the amended project would adversely impact habitat critical to the survival of for the Brown treecreeper and Diamond Firetail the species.

- *disrupt the breeding cycle of an important population*

No important populations of the three woodland bird species have been identified in the Indicative disturbance footprint therefore; it is unlikely the proposed development would disrupt the breeding cycle of an important population of the woodland bird species.

- *modify, destroy, remove, or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

The amended project would clear habitat for the woodland bird species; however, the amended project is considered a minor fragment of the extent and available habitat within the locality, and region. Within the locality of the indicative disturbance footprint, associated habitat for the three woodland bird species is known to occur, comprising:

- 1,782.77 ha for Brown Treecreeper (south-eastern)
- 299,116.44 for Diamond Firetail
- 105,473.58 for Painted Honeyeater.

Therefore, it is unlikely the amended project would modify, remove or decrease the availability of habitat for the three woodland bird species to the extent that the Brown Treecreeper, Diamond Firetail or Painted Honeyeater may decline.

- *result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat*

Habitat for the species within the Indicative disturbance footprint is varied in condition, with much of the surrounding woodland and agricultural landscape already modified and containing established weed and pest species. While invasive species are present within the broader landscape, the amended project is unlikely to introduce new pathways or substantially change habitat conditions in a way that would promote the establishment or spread of invasive species harmful to the species.

In addition, on-ground mitigation measures would be implemented to minimise indirect impacts on retained habitat, including vehicle and equipment hygiene controls, limiting vegetation clearing to the minimum necessary, and progressive stabilisation and rehabilitation of disturbed areas. In this context, the amended project is unlikely to result in invasive species becoming established in the species' habitat or to exacerbate existing invasive species pressures.

- *introduce disease that may cause the species to decline*

The amended project does not involve activities that are known to introduce or transmit diseases affecting bird species. While construction activities have the potential to indirectly introduce pathogens through soil disturbance, vehicle movement or equipment use, no bird-specific disease risks have been identified in association with the amended project. To minimise indirect risks, vehicle and equipment hygiene measures, biosecurity controls, and management of soil movement would be implemented during construction. In this context, the amended project is unlikely to introduce disease that would cause any of the species to decline.

— *interfere substantially with the recovery of the species*

There is currently no adopted or made recovery plan for the Brown Treecreeper and Diamond Firetail. The approved conservation advice for both species identifies a number of regional and local priority actions for each species to assist in recovery including protecting woodland, open forest and, grassland habitat from clearing, fragmentation and disturbance.

The recovery plan for the Painted Honeyeater lists a number of strategies for the recovery of the species including:

- identify, protect, manage, and restore foraging and movement habitats, at the local, regional and landscape scales
- define, monitor, reduce and manage threats
- improve understanding of species movement and habitat use at a landscape scale in order to better target protection and restoration measures
- engage local communities and stakeholders in conservation
- coordinate, review and report on recovery progress.

The amended project is likely to result in the loss of habitat for the species, however given the extent of available habitat in the local area (1782.77 ha for the Brown Treecreeper (south-eastern), 299,116.44 ha for the Diamond Firetail, and 105,473.58 ha for the Painted Honeyeater) it is unlikely to substantially interfere with the recovery of the Brown Treecreeper, Diamond Firetail or Painted Honeyeater.

B4.5.6 Conclusion

While the amended project would result in the loss of habitat, this habitat is not considered to be limiting in the locality of the Indicative disturbance footprint. Given the nature of the amended project and species mobility it is unlikely to result in a significant residual impact on the Brown Treecreeper (south-eastern), Diamond Firetail or Painted Honeyeater.

B4.6 *Falco hypoleucos* (Grey Falcon)

The Grey Falcon is listed as vulnerable under the EPBC Act.

B4.6.1 Description

The Grey Falcon is a medium-sized, light-coloured raptor that has a similar build to the Peregrine Falcon although it has longer wings. The species is sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. The breeding range is now mostly confined to arid parts of the range. While usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, it is occasionally found in open woodlands near the coast and occurs near wetlands where surface water attracts prey, mainly comprising of other birds such as parrots or pigeons.

B4.6.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

A summary of the relevant Commonwealth guidelines and policy statements available for this species is as follows:

- Conservation advice: "Conservation Advice for *Falco hypoleucos* (Grey Falcon)" (DEWHA 2023), which is in effect under the EPBC Act from 09/07/2020.
- Threat abatement plan: "Threat abatement plan for predation by feral cats 2024" {Commonwealth DCCEEW, 2024 #4656}. Canberra: Commonwealth of Australia. In effect under the EPBC Act from 24-Dec-2024.

Table B.28 identifies the sections of the Revised BDAR where key information relating to the assessment and management of this species is presented.

Table B.28 Reference to relevant sections of the Revised BDAR for *Falco hypoleucos*

Relevant section of the Revised BDAR
Methodology and survey effort – sections 2.3, 2.6 and 5.4.3
Habitat Information – sections 5.1.1 and 5.2
Impacts – sections 9.1.1, 11.1.1 and Chapter 12
Avoidance and Minimisation Measures – Chapter 8
Figures – Chapter 15

B4.6.3 Specific impacts

The species was not recorded during targeted bird surveys undertaken, however the species is known from the locality due to BioNet records and suitable habitat for the species is present in association with PCTs 10, 11, 13, 15, 17, 20, 22, 23, 24, 26, 28, 44, 45, 46, 47, 58, 157, 159, 160, 163, 164, 166, 170, 216 and 237. Based on associated PCTs, the amended project would result in the loss of 1230.47 ha of potential foraging habitat within the Indicative disturbance footprint for this species.

B4.6.4 Is this part of an important population?

In accordance with the *Matters of National Environmental Significance - Significant Impact Guidelines 1.1* (Department of the Environment Water Heritage and the Arts, 2013), the presence of an important population must be identified prior to addressing the significance impact criteria. An important population is defined in the Significant Impact Guidelines as a population that is necessary for a species' long-term survival and recovery. Under the EPBC Act, important populations are:

- likely to be key source populations either for breeding or dispersal
- likely to be necessary for maintaining genetic diversity
- at or near the limit of the species range.

No important populations have been defined for this species under the EPBC Act. Habitat for the species within the Indicative disturbance footprint is well represented within the broader locality and does not occur at, or near, the limit of the species' distribution. Given the species' range and mobility, it is unlikely that habitat within the Indicative disturbance footprint would constitute a key source population for breeding or dispersal or be necessary for maintaining the species' genetic diversity. Given the mobility of the species and the availability of extensive foraging and roosting habitat in the surrounding landscape, no important population of the Grey Falcon is likely to be present in the Indicative disturbance footprint.

B4.6.5 Significant impact criteria

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

- *lead to a long-term decrease in the size of an important population*

The amended project is unlikely to lead to a long-term decrease in the size of an important population, as the Grey Falcon is not considered to form part of an important population within the Indicative disturbance footprint. In addition, associated habitat for the species is well represented within the locality of the Indicative disturbance footprint.

- *reduce the area of occupancy of the species*

The area of occupancy of Grey Falcons is 6000 km^2 (Garnett *et al.* 2011). As part of the amened project, 1230.47 ha of potential foraging habitat will be removed. This represents only 0.2% of the area of occupancy for the species. The amended project is unlikely to reduce the area of occupancy for the species as it is wide ranging, highly mobile and naturally occurs in low densities. Further, a very small proportion of the potential foraging habitat within its area of occupancy will be removed or modified.

- *fragment an existing important population into two or more populations*

The species consists of a single population and occurs at low densities across inland Australia (TSSC, 2022). The Grey Falcon population within the Indicative disturbance footprint is not identified as an important population. In addition, given the nature of the amended project it is unlikely the amended project would create a barrier to the species movement. Therefore, it is unlikely the amended project would fragment an existing important population into two or more populations.

- *adversely affect habitat critical to the survival of a species*

Habitat critical to the survival of the Grey Falcon is shrubland, grassland and wooded watercourses of arid and semi-arid regions. The breeding range is mostly confined to arid parts of the species' range.

The Indicative disturbance footprint contains foraging habitat for the species; however, this habitat represents a minor component of the extensive foraging habitat available across the species' range and within the local area. The amended project would not affect breeding habitat and would result in only localised impacts to foraging areas, with clearing minimised through mitigation measures including micro-siting. As such, the amended project is unlikely to adversely affect habitat critical to the survival of the Grey Falcon.

- *disrupt the breeding cycle of an important population*

The amended project would not disrupt the breeding cycle of an important population as the Grey Falcon is not considered an important population within the Indicative disturbance footprint.

- *modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

Habitat within the Indicative disturbance footprint has been previously modified, and similar habitat occurs extensively within the local area. The amended project would potentially result in localised habitat removal, with the majority of habitat spanned by transmission lines rather than cleared and impacts further reduced through micro-siting during detailed design.

The loss of habitat represents approximately 0.2% of the species' area of occupancy. Given the small scale of impact, the availability of extensive suitable habitat within the local area, and the mobility of the species, the amended project is unlikely to modify, destroy, remove, isolate or decrease the availability or quality of habitat to an extent that would cause the Grey Falcon to decline.

- *result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat*

Due to past land uses invasive weeds and vertebrate pests such as rabbits, cats and foxes are already established within the landscape. Therefore, it unlikely the amended project would result in invasive species that are harmful to species becoming established. In addition, mitigation measures such as weed controls and hygiene protocols would be implemented to further minimise the impact of invasive species on habitat for the Grey Falcon.

- *introduce disease that may cause the species to decline*

There are no known diseases identified as a threat to the Grey Falcon under current Commonwealth guidance. While construction activities can present a general risk of pathogen transfer, this risk is not species specific.

Implementation of standard hygiene and biosecurity measures during construction would minimise the likelihood of introducing or spreading disease. As such, the project the amended project is unlikely to introduce disease that would cause the species to decline.

- *interfere substantially with the recovery of the species*

There is currently no recovery plan for the Grey Falcon, the approved conservation advice for the species identifies actions for the conservation and recovery of the species, including:

- support improved fire and grazing management in areas where Grey Falcons are known to occur
- protect known nesting trees and include adequate exclusion buffers with regard to proposed developments and land clearing activities
- support the establishment and survival of replacement nest trees in areas where Grey Falcon in known to breed

- retain artificial structures with known or potential Grey Falcon nests, and
- control invasive cats and camels in areas where Grey Falcons are known to occur, especially in known roosting and nesting areas.

The amended project would result in the loss of potential foraging habitat; however, suitable habitat for the species is well represented within the surrounding locality. Clearing would be localised and largely limited to discrete infrastructure footprints, with impacts further reduced through micro-siting during detailed design. Given the availability of habitat in the surrounding landscape and the implementation of these measures, the amended project is unlikely to substantially interfere with the recovery of the Grey Falcon.

B4.6.6 Conclusion

Based on the assessment above, including the mobility and distribution of the species, and the implementation of avoidance, minimisation and compensatory measures, the amended project is unlikely to have a significant impact on the Grey Falcon.

B4.7 *Melanodryas cucullata cucullata* (Hooded Robin (South-eastern))

The Hooded Robin (south-eastern) is listed as endangered under the EPBC Act and BC Act.

B4.7.1 Description

The south-eastern subspecies of the Hooded Robin occurs in south-eastern Australia from far south-east Queensland to Yorke Peninsula, South Australia, intergrading with *M. c. picata* in the southern Murray-Darling basin. The subspecies is now absent from many formerly occupied sites, particularly in the wetter areas of the south and east.

The Hooded Robin (south-eastern) prefers dry eucalypt and acacia woodland and shrublands with an open understorey, some grassy areas and a complex ground layer. They avoid woodlands with tall trees or dense tree cover but sometimes occur in tall, dense heaths with scattered open areas. While they can occur in patches as small as 2.9 ha in agricultural landscapes, they prefer larger patches greater than 10 ha with moderately deep to deep soils. Individuals tend to forage on insects and small lizards taken from the ground, and the subspecies builds nests in a tree fork or crevice, from less than 1 m to 5 m above the ground.

B4.7.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

A summary of the relevant Commonwealth guidelines and policy statements available for this species is as follows:

- Conservation advice: "Conservation Advice for *Melanodryas cucullata cucullata* (hooded robin (south-eastern))" (Department of Climate Change, Energy, the Environment and Water, 2023). In effect under the EPBC Act from 31-Mar-2023.
- Threat abatement plan: "Threat abatement plan for predation by feral cats 2024" {Commonwealth DCCEEW, 2024 #4656}. Canberra: Commonwealth of Australia. In effect under the EPBC Act from 24-Dec-2024.

Table B.29 identifies the sections of the Revised BDAR where key information relating to the assessment and management of this species is presented.

Table B.29 Reference to relevant sections of the Revised BDAR for *Melanodryas cucullata cucullata*

Relevant section of the Revised BDAR
Methodology and survey effort – sections 2.3, 2.6 and 5.4.3
Habitat Information – sections 5.1.1 and 5.2
Impacts – sections 9.1.1, 11.1.1 and Chapter 12
Avoidance and Minimisation Measures – Chapter 8
Figures – Chapter 15

B4.7.3 Specific impacts

The Hooded Robin was not recorded during targeted surveys, however suitable habitat for the species is present in association with PCTs 7, 10, 11, 13, 15, 20, 23, 26, 28, 58, 86, 170 237, 266, 277, 319 and 343. The amended project is predicted to result in the loss of 659.92 ha of habitat for the species.

B4.7.4 Significant impact criteria

An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance of possibility that it will:

- *lead to a long-term decrease in the size of a population*

The Hooded Robin (south-eastern) inhabits dry eucalypt and acacia woodlands and shrublands with an open understorey and a complex ground layer, typically favouring larger woodland patches greater than 10 ha, although it can persist in smaller patches within agricultural landscapes. The subspecies forages primarily on ground-dwelling invertebrates and nests in tree forks or crevices, generally below 5 m above ground.

Recent estimates indicate an Australian population of approximately 68,000 mature individuals, with a declining trend attributed primarily to broad-scale habitat loss and fragmentation. Habitat for the species is well represented with 105517.42 ha of associated habitat occurring within 10 km of the Indicative disturbance footprint, resulting in the loss of 0.63% of associated habitat. While the amended project would result in the removal of habitat suitable for the species, this represents approximately 0.63% of available habitat and would not materially reduce the extent of preferred habitat at a scale relevant to the population. Given the limited proportion of habitat affected and the availability of extensive suitable habitat within the surrounding landscape, the amended project is unlikely to contribute to a long-term decrease in the size of the Hooded Robin (south-eastern) population.

- *reduce the area of occupancy of the species*

The sub-species currently has a widespread distribution with an extent of occurrence of 1,200,000 km^2 and an area of occupancy of 30,000 km^2. The loss of habitat represents 0.022% of the area of occupancy. Given the extent of habitat impacts and known records within the locality it not likely that the amended project would reduce the area of occupancy of the species.

- *fragment an existing population into two or more populations*

The approved conservation advice for the Hooded Robin (south-eastern) indicates that the subspecies is not currently considered to be severely fragmented, although fragmented populations may occur in parts of its range. The amended project does not occur at the edge of the species' known distribution.

While the amended project would involve vegetation clearing associated with transmission line infrastructure, the linear nature of the amended project, combined with micro-siting of towers and access tracks, would limit clearing to discrete locations rather than creating continuous barriers. In addition, the amended project has been designed to retain native vegetation within the transmission line easement where practicable, including the establishment of connectivity corridors of up to 10 m (330 kV) or 20 m (500 kV) width near tower locations in woodland vegetation. These measures are intended to maintain landscape permeability and facilitate movement of woodland fauna through the amended project area.

Given the mobility of the species, the retention of vegetated linkages, the amended project is unlikely to create a barrier to dispersal or genetic exchange that would fragment the Hooded Robin (south-eastern) population into two or more populations.

- *adversely affect habitat critical to the survival of a species*

The approved conservation advice for the Hooded Robin (south-eastern) identifies habitat critical to the survival of the species as areas of:

- dry eucalypt and acacia woodlands and shrublands remnants with an open understorey, some grassy areas and a complex ground layer, often in or near clearings or open areas
- structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses

- standing dead or live trees and tree stumps are also essential for nesting, roosting and foraging
- moderately deep to deep soils, rocks and fallen timber which provides essential foraging habitat.

The approved conservation advice notes that habitat meeting these characteristics should be retained and managed to avoid clearing, fragmentation or degradation, and that known or likely habitat may be considered habitat critical to the survival of the species. Based on the proportion of associated habitat for the species within the Indicative disturbance footprint and greater locality, alongside the condition of habitat present; the amended project is unlikely to result in the loss of habitat critical to the survival of the species.

- *disrupt the breeding cycle of a population*

Hooded Robins typically build nests in tree forks or crevices and may return to the same general breeding areas in successive seasons. Habitat for the species is well represented with 105517.42 ha of associated habitat occurring within 10 km of the Indicative disturbance footprint, resulting in the loss of 0.63% of associated habitat. It is unlikely that the removal of a small proportion of foraging habitat is likely to disrupt the breeding cycle to the extent of impacting the breeding success of a local population.

- *modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

The amended project is predicted to result in the loss of approximately 659.92 ha of assumed habitat for the Hooded Robin (south-eastern). Localised effects such as increased edge influences and fragmentation may occur due to the linear nature of the project. However, design and construction measures, including limiting vegetation clearing to discrete locations, retaining surrounding habitat, and maintaining landscape permeability, would reduce any localised effects on habitat availability. In relation to the well represented quality habitat for the species within the greater locality of the Indicative disturbance footprint, the loss of such habitat is not likely to isolate or decrease the quality of habitat to the extent that the species is likely to decline.

- *result in invasive species that are harmful to an endangered species becoming established in the endangered or species' habitat*

The approved conservation advice for the Hooded Robin (south-eastern) identifies invasive weeds and introduced predators as ongoing threats, due to their potential to alter habitat structure and increase predation pressure. Invasive species are already present within the broader landscape because of historical land use.

While construction activities have the potential to facilitate the localised spread of invasive species, the amended project is unlikely to introduce new invasive species or substantially exacerbate existing invasive species pressures. Mitigation measures, including vehicle and equipment hygiene, management of soil movement, minimisation of disturbance to retained vegetation, and progressive rehabilitation of disturbed areas, would reduce the potential for weed establishment.

Given the existing landscape context and the implementation of these measures, the amended project is unlikely to result in invasive species that are harmful to the Hooded Robin (south-eastern) becoming established in the species' habitat.

- *introduce disease that may cause the species to decline*

There are no diseases currently identified as a threat to the Hooded Robin (south-eastern) in the approved conservation advice. The amended project does not involve activities that would directly introduce or transmit diseases affecting the species.

Construction activities may pose a general, non-species-specific risk of pathogen movement via soil, vehicles or equipment. This risk would be managed through the implementation of standard hygiene and biosecurity measures during construction, including cleaning of vehicles and equipment prior to entering and moving between work areas. With these measures in place, the amended project is unlikely to introduce disease that would cause the Hooded Robin (south-eastern) to decline.

- *interfere substantially with the recovery of the species*

There is currently no official recovery plan in place for the subspecies, however a number of conservation and management priorities are listed in the approved conservation advice. These include the following objectives:

- cease all land clearing of habitat critical for the survival of Hooded Robin (south-eastern)
- retain and restore all remnant woodland patches in areas of habitat critical for the survival of Hooded Robin (south-eastern)
- ensure populations remain connected by avoiding gaps greater than 100 m between habitat patches and along linear remnants. Eliminate gaps through revegetation (either corridors or stepping stone plantings), focusing on important movement pathways.

The project is unlikely to interfere with these conservation objectives as it is not likely to clear habitat critical to the survival of the subspecies, and mitigation measures are in place to retain the quality of habitat for the species both within the Indicative disturbance footprint and wider locality.

B4.7.5 Conclusion

The amended project would result in the loss of approximately 659.92 ha of assumed habitat for the Hooded Robin (south-eastern), which is not significant in consideration of the 105517.42 ha of associated habitat occurring within 10 km of the Indicative disturbance footprint. As such, it is unlikely that the amended project would have a significant impact on the Hooded Robin (south-eastern).

B4.8 Hirundapus caudacutus (White-throated Needletail)

White throated Needletail is listed as vulnerable under the EPBC Act.

B4.8.1 Description

The White-throated Needletail (subsp. *caudacutus*) breeds in northern Japan west to central and eastern Siberia and occurs in Australia during the non-breeding season, usually between September and April. In NSW the species has been recorded in all coastal regions extending inland to the western slopes of the Great Dividing Range and occasionally onto the adjacent inland plains. White-throated Needletail is a large swift with a thickset, cigar-shaped body, stubby tail and long pointed wings (20 cm in length and approximately 115–120 g in weight). It is mostly aerial, from heights of less than 1 m up to more than 1000 m above the ground. Although they occur over most types of habitats, they are recorded most often above wooded areas, including open forest and rainforest, and may also fly below the canopy between trees or in clearings. White-throated Needletail has been recorded eating a wide variety of insects in Australia including beetles, cicadas, flying ants, bees, wasps, flies, termites, moths, locusts and grasshoppers. It is most often seen in eastern Australia before storms, low pressure troughs and approaching cold fronts and occasionally bushfire. These conditions are often used by insects to swarm (e.g. termites and ants) or tend to lift insects away from the surface which favours sighting of White-throated Needletails as they feed (Threatened Species Scientific Committee, 2019b).

B4.8.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

A summary of the relevant Commonwealth guidelines and policy statements available for this species is as follows:

- Conservation advice: "Conservation Advice *Hirundapus caudacutus* White-throated Needletail" (Threatened Species Scientific Committee, 2019b). In effect under the EPBC Act from 04-Jul-2019.

Additional resources reviewed:

- The "Draft referral guideline for 14 birds listed as migratory species under the EPBC Act" (Department of the Environment, 2015a) [Admin guideline].

Table B.30 identifies the sections of the Revised BDAR where key information relating to the assessment and management of this species is presented.

Table B.30 Reference to relevant sections of the Revised BDAR for *Hirundapus caudacutus*

Relevant section of the Revised BDAR
Methodology and survey effort – sections 2.3, 2.6 and 5.4.3
Habitat Information – sections 5.1.1 and 5.2
Impacts – sections 9.1.1, 11.1.1 and Chapter 12
Avoidance and Minimisation Measures – Chapter 8
Figures – Chapter 15

B4.8.3 Specific impacts

White-throated Needletail has been assessed as moderately likely to occur due to the existence of records from BioNet within the Indicative disturbance footprint, in addition to the presence of extensive suitable habitat for the species within the Indicative disturbance footprint. This species is associated with the following PCTs: 7, 10, 11, 13, 15, 17, 24, 26, 44, 45, 46, 47, 157, 160, 216, 237, 266, 277, 319 & 343 (associated habitat impacts total 819.7 ha within the Indicative disturbance footprint). Additional specific impacts to this species related to the amended project include the loss of potential roosting sites (old, hollow bearing trees) and reduction of invertebrate prey. Collision-strike risk from overhead wires are also an identified threat for this species in the conservation advice (Threatened Species Scientific Committee, 2019b) – however this risk is likely to decrease over time as the species becomes habituated to the presence of the alignment.

B4.8.4 Is this part of an important population?

No important populations have been defined for this species under the EPBC Act. In accordance with the *Matters of National Environmental Significance - Significant Impact Guidelines 1.1* (Department of the Environment, 2013b) the presence of an important population must be identified prior to addressing the significance impact criteria. An important population is defined in the Significant Impact Guidelines as a population that is necessary for a species' long-term survival and recovery. Under the Act, important populations are:

- likely to be key source populations either for breeding or dispersal
- likely to be necessary for maintaining genetic diversity
- at or near the limit of the species range.

In Australia, the White-throated Needletail is almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground. Because they are aerial, it has been stated that conventional habitat descriptions are inapplicable, but there are, nevertheless, certain preferences exhibited by the species. Although they occur over most types of habitats, they are recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland. They also commonly occur over heathland, but less often over treeless areas, such as grassland or swamps.

The "Draft referral guideline for 14 birds listed as migratory species under the EPBC Act" outlines that "an action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it would seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species." Based on this guideline, an ecologically significant proportion of the White-throated Needletail population is 1% internationally (100 individuals) or 10% nationally (10 individuals) (Department of the Environment, 2015a).

While the amended project is expected to impact on associated habitat for this species, the amended project does not contain key resources for breeding or dispersal, does not occur at the limit of the species distribution range and is unlikely to be necessary for maintaining genetic diversity. Consequently, any individuals which may occur are not considered to form part of an 'important population'. Collision with overhead wires has the potential for short-term injury or mortality to migrating individuals, however this impact is expected to decrease over time as birds become better habituated to the presence of the infrastructure. It is unlikely that the amended project would significantly impact on an ecologically significant proportion of the population nationally or internationally.

B4.8.5 Significant impact criteria

An action is likely to have a significant impact on a Vulnerable species if there is a real chance or possibility that it will:

- *lead to a long-term decrease in the size of an important population*

No important population of the White-throated Needletail has been identified within the Indicative disturbance footprint. While the amended project may result in localised impacts to individual birds, including collision risk with overhead transmission lines, these impacts would be short-term and affect individuals rather than a population. Given the absence of an important population and the highly mobile nature of the species, the amended project is unlikely to lead to a long-term decrease in the size of an important population.

- *reduce the area of occupancy of an important population*

No important population occurs within the amended project area and, given the species' wide-ranging aerial behaviour, the amended project is unlikely to reduce the area of occupancy of an important population.

- *fragment an existing important population into two or more populations*

No important population of the White-throated Needletail has been identified within the Indicative disturbance footprint. While transmission lines have the potential to pose a collision risk to individual birds, the species is highly mobile and wide-ranging, and extensive associated habitat (approximately 334,139.40 ha within the local area) would remain unaffected by the amended project.

Bird-strike mitigation, including conductor line-marking and bird diverters, would be implemented in areas of elevated risk, further reducing the likelihood of collision. Given the absence of an important population and the aerial behaviour of the species, the amended project is unlikely to fragment an existing important population into two or more populations.

- *adversely affect habitat critical to the survival of a species*

No habitat critical to the survival of the White-throated Needletail has been formally identified under the EPBC Act. While the species may use large tracts of native vegetation for foraging and may roost in hollows of tall trees or on rock or bark faces, these habitat features are widespread within the broader landscape and are not limited to the Indicative disturbance footprint.

The amended project would result in the localised removal of grassland and woodland habitat, including some hollow-bearing trees; however, this represents a small proportion of available habitat within the wider region. The amended project area does not occur within the core range of the species in Australia, which is predominantly coastal. The amended project is unlikely to adversely affect habitat critical to the survival of the White-throated Needletail.

- *disrupt the breeding cycle of an important population*

This species does not breed in Australia and therefore the breeding cycle would not be impacted.

- *modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

The amended project would result in the removal or modification of up to 819.7 ha of associated habitat within the Indicative disturbance footprint; however, only a small proportion of this area is likely to represent habitat of relevance to the White-throated Needletail. The species is highly mobile, forages aerially over a wide range of landscapes, and does not rely on site-specific habitat features within the amended project footprint.

Design and construction measures, including limiting vegetation clearing to discrete locations, retaining surrounding habitat, and maintaining landscape permeability, would further reduce any localised effects on habitat availability. Given the wide-ranging movement patterns of the species and the availability of extensive similar habitat in the surrounding region, the amended project is unlikely to modify, destroy or reduce habitat to an extent that would cause the species to decline.

- *result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat*

No invasive species are specifically identified as a threat to the White-throated Needletail under Commonwealth conservation advice. Introduced predators such as cats and foxes are already present within the broader landscape as a result of historical land use.

The amended project would not introduce new invasive species pathways. Biosecurity and hygiene measures, including controls on vehicle and equipment movement, management of imported materials, and rehabilitation of disturbed areas, would minimise the potential for the spread or establishment of invasive species. Accordingly, the amended project is unlikely to result in invasive species harmful to the White-throated Needletail becoming established in the species' habitat

- *introduce disease that may cause the species to decline*

There are no known diseases identified as a threat to the White-throated Needletail under current Commonwealth guidance. While construction activities can present a general risk of pathogen transfer, this risk is not species-specific.

Implementation of standard hygiene and biosecurity measures during construction would minimise the likelihood of introducing or spreading disease. As such, the amended project is unlikely to introduce disease that would cause the species to decline.

- *interfere substantially with the recovery of the species*

There is no approved recovery plan for the White-throated Needletail. The approved conservation advice identifies conservation priorities that are primarily focused on protecting breeding habitat overseas and improving understanding and management of habitat use within Australia.

The amended project does not affect breeding habitat, does not occur within the core Australian range of the species, and would not preclude the implementation of any recovery or conservation actions identified in Commonwealth guidance. The amended project is unlikely to substantially interfere with the recovery of the White-throated Needletail.

B4.8.6 Conclusion

The White-throated Needletail is a non-breeding, migratory species in Australia that forages aerially over a wide range of habitats and occurs at higher densities in coastal areas, with more sporadic use of inland regions. The amended project would result in the removal of up to 819.7 ha of associated habitat and may introduce a localised collision risk associated with transmission line infrastructure.

However, the amended project does not occur within the core range of the species, does not support key habitat required for breeding or population persistence, and extensive similar habitat would remain available in the surrounding landscape. With the incorporation of design, biosecurity and bird-strike mitigation measures, the density of individuals using the amended project footprint is not expected to cause a significant impact to existing populations of the White-throated Needletail.

B4.9 *Lophochroa leadbeateri leadbeateri* (Pink Cockatoo)

The Pink Cockatoo is listed as endangered under the EPBC Act.

B4.9.1 Description

The Pink Cockatoo is found across the arid and semi-arid inland, from south-western Queensland south to north-west Victoria, through most of South Australia, north into the south-west Northern Territory and across to the west coast between Shark Bay and about Jurien. In NSW, it is found regularly as far east as about Bourke and Griffith, and sporadically further to the east. The species inhabits a wide range of tree and treeless inland habitats, always in close proximity to water, normally found in pairs or small groups, though flocks of hundreds may be found where food is abundant. Pink Cockatoos feed mostly on the ground, especially on the seeds of native and exotic melons and on seeds of species of saltbush, wattles and cypress pines. They nest in tree hollows throughout the second half of the year; nests are at least 1 km apart, with no more than one pair every 30 km^2.

This subspecies occurs in the Murray-Darling, Eyre and Bulloo River Basins, from Isisford and Roma in the north, through western New South Wales to north-west Victoria and west to eastern South Australia. It occupies arid and semi-arid woodlands dominated by mulga (*Acacia aneura*), mallee and box eucalypts, slender cypress pine (*Callitris gracilis*) or belah (*Casuarina cristata*). Within these vegetation types, the subspecies' main requirements are fresh surface water and trees with suitable nesting hollows. Observed nesting hollows are averaged to have a 13.3 x 27.7 centimetres entrance diameter with a 53.9-centimetre depth. These hollows are usually restricted to large, tall trees preferably 130–140 years old and found in intact mature woodland.

B4.9.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

The relevant Commonwealth guidelines and policy statements available for this species includes:

- Conservation advice: "Approved Conservation Advice for *Lophochroa leadbeateri leadbeateri* (eastern Major Mitchell's cockatoo)". Canberra 2023: Department of Climate Change, Energy, the Environment and Water.
- Threat abatement plan: "Threat abatement plan for predation by feral cats 2024" {Commonwealth DCCEEW, 2024 #4656}. Canberra: Commonwealth of Australia. In effect under the EPBC Act from 24-Dec-2024.

Table B.31 identifies the sections of the Revised BDAR where key information relating to the assessment and management of this species is presented.

Table B.31 Reference to relevant sections of the Revised BDAR for *Lophochroa leadbeateri leadbeateri*

Relevant section of the Revised BDAR
Methodology and survey effort – sections 2.3, 2.6, 5.4.2 and 5.4.3
Habitat Information – sections 5.1.1, 5.1.2, 5.2, 5.3, 5.3.10
Impacts – sections 9.1.1, 9.1.5, 9.2.3, 11.1.1, 11.1.2 and Chapter 12
Avoidance and Minimisation Measures – Chapter 8
Figures – Chapter 15

B4.9.3 Specific impacts

The species has been recorded in close proximity to the Indicative disturbance footprint during surveys in 2024 and 2025. The species is highly mobile and moves throughout the landscape for foraging, though remaining within proximity to fresh water. The species was observed flying across Maude Road within one kilometre of the Indicative disturbance footprint on several occasions in October 2024; these movements were between agricultural land where it was presumably foraging, and between mature River Red Gums along the Edward River. Further observations were made in October 2024 on Berrambong Railway Road, Keri Keri Road and north of Moulamein-Wanganella Road and in proximity of the Indicative disturbance footprint. The survey effort to date includes habitat assessment, bird census and further survey of suitable breeding habitat. The surveys were completed during the survey period (as per TBDC) with no breeding behaviour recorded from the individual sightings inside and outside of the Indicative disturbance footprint. Such surveys determine the Indicative disturbance footprint provides foraging habitat but no breeding habitat. However, under a precautionary approach, areas of potential suitable breeding habitat within the Indicative disturbance footprint not subject to adequate survey effort are assumed to support the breeding of the species and 43.72 ha of assumed presence has been applied. The amended project would incur additional impacts in the form of foraging habitat (720.27 ha).

Additional considerations of impacts to this species associated with risk of collision with lines and EMF impacts with new infrastructure as noted in section 9.2.3 of the Revised BDAR.

B4.9.4 Significant impact criteria

An action is likely to have a significant impact on an endangered or critically endangered species if there is a real chance or possibility that it will:

- *lead to a long-term decrease in the size of a population*

The approved conservation advice for the species notes that the species population is at 15,000 mature individuals. The amended project would result in the loss of 43.72 ha of potential breeding habitat for the species. Within the Indicative disturbance footprint, vegetation species associated with arid and semi-arid woodlands are scattered; however, fresh surface water and trees with suitable nesting hollows are locally abundant. While no breeding activity was recorded during targeted survey, under a precautionary approach, areas not subject to adequate survey effort have been assumed to contain breeding habitat for the species resulting in 43.72 ha of breeding habitat being impacted. An additional 720.27 ha of foraging habitat has been identified to be impacted by the amended project but is considered to be minor compared to the overall habitat represented within the broader locality.

Consequently, it is unlikely for the loss of habitat to lead to a long-term decline on the Pink Cockatoo population.

- *reduce the area of occupancy of a population*

The area of occupancy for the Pink Cockatoo covers 225,000 km^2. The area of occupancy includes the Murray-Darling, Eyre and Bulloo River basins including Queensland, western NSW, South Australia (near the NSW/Victorian border) and north-west Victoria. Pink Cockatoo's are likely to occupy 20-30% of the previous range (DCCEEW 2023). The species is highly reliant on intact wooded areas for traversing through the landscape and are extremely common within the region due to the presence of intact, vegetated corridors, particularly associated with riparian habitats. The loss of habitat associated with the amended project represents just 0.003% of associated habitat found within the local area (165,512.64 ha). Considering the small extent of local habitat to be removed and the mobile nature of the species, it is unlikely that the amended project would significantly reduce the area of occupancy of the Pink Cockatoo.

- *disrupt the breeding cycle of a population*

Pink Cockatoo's require hollow bearing trees for breeding and the home range for each breeding pair is 30 km^2. The species requires hollow bearing trees (hollows >10 cm in diameter) across its range and connectivity within the landscape to ensure adequate connectivity for foraging. A compensatory habitat strategy for hollow dependant fauna would be provided that directly addresses the amended project impacts to nesting habitat for threatened fauna displaced during construction.

The strategy would include the following requirements:

- survey of tree hollows and nests within the proposed clearing extents and evaluation of hollow utilisation and resource availability.
- investigation into strategic and optimal placement of hollows for the targeted species within the locality/region
- investigating new and emerging monitoring
- funding of targeted research that contributes to effective compensatory habitat measures relevant to the amended project impacts; and
- measures to address and manage nests (such as raptor nests) prior to clearing.

No breeding activity was recorded for this species during surveys of the Indicative disturbance footprint within the breeding season. In areas not subject to adequate targeted survey, 43.72 ha of assumed breeding habitat has been identified. However, given extensive survey effort has not identified breeding behaviour of this species within the amended project and the residual impact to assumed breeding habitat is minimal compared to overall habitat available in the broader locality, it is unlikely that the amended project will disrupt the breeding cycle of a population of this species.

- *fragment an existing population into two or more populations*

The maximum cleared area for individual tower footprints or laydown areas would not exceed approximately 0.5 ha, and the transmission line easement would be up to approximately 200 m wide, allowing for micro-siting to avoid significant environmental constraints. The linear nature of the amended project means that clearing would be discontinuous, with large areas of habitat retained between infrastructure elements.

Measures to reduce collision risk and maintain movement through the landscape would be implemented, including conductor line-marking and bird diverters in areas of elevated risk, particularly near wetland and riparian habitats. These measures will be undertaken to minimise strike risk to the species, however considering the linear nature of the project and diversion of flight paths, it is expected that the amended project would result in some localised fragmentation of habitat for the species and result in altered movement pathways. However considering the mobile nature of the species and extent of occurrence, it is unlikely to fragment an existing population into two or more populations.

- *adversely affect habitat critical to the survival of a species*

No Critical Habitat as defined under section 207A of the EPBC Act has been included in the register of Critical Habitat (Department of Climate Change Energy the Environment and Water 2023). The approved conservation advice for the species identifies habitat critical for the survival of the Pink Cockatoo as:

- arid and semi-arid woodlands dominated by mulga (*Acacia aneura*), mallee and box eucalypts, slender cypress pine (*Callitris gracilis*) or belah (*Casuarina cristata*)
- known habitat containing suitable attributes, including potential habitat for the subspecies, especially where there are large mature trees with suitable hollows; and
- surrounding matrix of these areas for the role of providing movement corridors for dispersal across the landscape.

Survey conducted in the Indicative disturbance footprint does not suggest the presence of suitable breeding habitat for the species, as such, only assumed breeding habitat where there was a lack of targeted survey effort and potential foraging habitat may be impacted. Considering this, and the extent of habitat to be removed in proportion to the availability of quality habitat in the wider locality, it is unlikely that the project will adversely affect habitat critical to the survival of the species.

- *modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

The amended project would result in the loss 43.27 ha of assumed breeding habitat and 720.27 ha of foraging habitat for the Pink Cockatoo. Vegetation species associated with arid and semi-arid woodlands are sparsely scattered within the Indicative disturbance footprint, and no evidence of breeding habitat is present. Within the greater locality, fresh surface water and trees with suitable nesting hollows are abundant. The amended project may only impact on assumed breeding habitat or potential foraging habitat for the Pink Cockatoo, as such, it is unlikely that the amended project could modify, destroy, remove or isolate habitat to an extent that would cause a local population of the Pink Cockatoo to decline.

- *result in invasive species that are harmful to a vulnerable species becoming established in the endangered*

Introduced pest species are already present throughout the broader landscape. The amended project would not introduce new invasive species pathways or substantially alter existing habitat conditions in a manner that would promote the establishment of invasive species harmful to the Pink Cockatoo.

Implementation of standard biosecurity and hygiene measures during construction, including controls on vehicle movement, equipment cleaning and management of disturbed areas, would further reduce the likelihood of invasive species spread. Accordingly, the amended project is unlikely to result in invasive species harmful to the Pink Cockatoo becoming established in the species' habitat.

- *introduce disease that may cause the species to decline*

The key disease likely to impact this species is *Psittacine Circovirus* Disease (PCD). The disease is believed to have evolved with wild psittacines and is widespread, including many common Australian species. Noting PCD is already present within the landscape and given the nature and scale of the amended project it is unlikely it would introduce a disease that may cause the species to decline.

- *interfere substantially with the recovery of the species*

There is no current Recovery Plan for this species. The approved conservation advice outlines a number of conservation and recovery actions for the species. The primary conservation objectives outlined are to:

- arrest the current decline and achieve a stable or increasing population trend and
- increase nesting habitat availability within the subspecies' range, and improve connectivity.

The amended project would result in the loss of 43.27 ha of assumed breeding habitat and 720.27 ha of foraging habitat for the Pink Cockatoo. No evidence of breeding for the species was recorded during targeted survey, and high quality habitat is well represented in the locality of the Indicative disturbance footprint. As such, it is unlikely for the amended project to interfere substantially with the recovery of the species.

B4.9.5 Conclusion

The amended project would result in the removal of 43.27 ha of assumed breeding habitat and 720.27 ha of foraging habitat for the Pink Cockatoo, in relation to the 165,512.64 ha of associated habitat found within the locality of the Indicative disturbance footprint. Considering the extent of impacts, it is unlikely the amended project would result in a significant impact on the Pink Cockatoo.

B4.10 *Neophema chrysostoma* (Blue-winged Parrot)

The Blue-winged Parrot is listed as Vulnerable under the EPBC Act.

B4.10.1 Description

The Blue-winged Parrot is a slender parrot weighing less than 50 g and up to 24 cm in length. A yellow facial patch extends back to the eye alongside a narrow, dark blue band running from eye to eye across the forehead. A large dark blue patch also extends down the wings of the species. The Blue-winged Parrot is a partial migrant species, breeding on mainland Australia south of the Great Dividing Range and variable numbers migrating across the Bass Strait in winter (DCCEEW, 2023). During the non-breeding period from autumn to early spring, birds inhabit northern Victoria, eastern South Australia, south-western Queensland and western New South Wales. The species inhabit habitats from coastal, sub-coastal and inland areas, through to semi-arid zones. Favourable habitats include grasslands, grassy woodlands and wetlands. Eucalypt forests and woodlands are favourable during the breeding season, due to the presence of hollows in live or dead trees or stumps.

B4.10.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

A summary of the relevant Commonwealth statutory document for these species is:

- Conservation advice: "Conservation Advice for *Neophema chrysostoma* (Blue-winged parrot)" (DEWHA 2023), which is in effect under the EPBC Act from 31-Mar-2023.
- Threat abatement plan: "Threat abatement plan for predation by feral cats 2024" {Commonwealth DCCEEW, 2024 #4656}. Canberra: Commonwealth of Australia. In effect under the EPBC Act from 24-Dec-2024.

Table B.32 identifies the sections of the Revised BDAR where key information relating to the assessment and management of this species is presented.

Table B.32 Reference to relevant sections of the Revised BDAR for *Neophema chrysostoma*

Relevant section of the Revised BDAR
Methodology and survey effort – sections 2.3, 2.6 and 5.4.3
Habitat Information – sections 5.1.1 and 5.2
Impacts – sections 9.1.1, 11.1.1 and Chapter 12
Avoidance and Minimisation Measures – Chapter 8
Figures – Chapter 15

B4.10.3 Specific impacts

The species was recorded within the Indicative disturbance footprint with extensive habitat in both the Indicative disturbance footprint, locality and region. The habitat within the Indicative disturbance footprint is associated with PCTs 7, 11, 13, 15, 17, 24, 26, 28, 44, 45, 46, 58, 157, 159, 160, 163, 164, 170 & 216. The amended project would result in the loss of 1,185.98 ha of habitat within the Indicative disturbance footprint for this species.

B4.10.4 Is this part of an important population?

In accordance with the *Matters of National Environmental Significance - Significant Impact Guidelines 1.1* (Department of the Environment Water Heritage and the Arts, 2013), the presence of an important population must be identified prior to addressing the significance impact criteria. An important population is defined in the Significant Impact Guidelines as a population that is necessary for a species' long-term survival and recovery. Under the Act, important populations are:

- likely to be key source populations either for breeding or dispersal
- likely to be necessary for maintaining genetic diversity
- at or near the limit of the species range.

The Blue-winged Parrot was recorded within the Indicative disturbance footprint and is known to occur in the surrounding locality. Habitat for the species within the Indicative disturbance footprint is well represented within the broader locality and does not occur at, or near, the limit of the species' distribution. Given the species' range and ecology, it is unlikely that habitat within the Indicative disturbance footprint would constitute a key source population for breeding or dispersal or be necessary for maintaining the species' genetic diversity. In addition, the breeding range of the Blue-winged Parrot is restricted to Tasmania and southern Victoria. Therefore, it is not considered that the Blue-winged Parrot would represent an important population within the Indicative disturbance footprint.

B4.10.5 Significant impact criteria

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

- *lead to a long-term decrease in the size of an important population*

The amended project is unlikely to lead to a long-term decrease in the size of an important population, as the Blue-winged Parrot is not considered to form part of an important population within the Indicative disturbance footprint. In addition, habitat for the species is well represented within the Indicative disturbance footprint and the surrounding local area, with approximately 497,218.47 ha of associated habitat occurring within the local area.

- *reduce the area of occupancy of an important population*

The extent of occurrence for this species is estimated to be 170,000 km^2. The loss of habitat within the Indicative disturbance footprint only represents 0.007% of the area of occupancy for the species. The amended project is unlikely to reduce the area of occupancy of an important population, as the species is not considered to represent an important population within the Indicative disturbance footprint.

- *fragment an existing important population into two or more populations*

The Blue-winged Parrot is not considered an important population within the Indicative disturbance footprint. Therefore, it is unlikely the amended project would fragment an existing important population into two or more populations. In addition, given the nature of the amended project, and mobility of the species, it is unlikely the amended project would create a barrier to the species movement.

- *adversely affect habitat critical to the survival of a species*

Habitat critical to the survival of the Blue-winged Parrot includes hollow-bearing trees used for breeding within the species' breeding range, as well as foraging and staging habitat in coastal, sub-coastal and semi-arid environments, particularly grasslands and grassy woodlands. The breeding range of the species is restricted to Tasmania, coastal south-eastern South Australia and southern Victoria.

The Indicative disturbance footprint contains foraging habitat for the species; however, this habitat represents a minor component of the extensive foraging habitat available across the species' range and within the local area. The amended project would not affect breeding habitat and would result in only localised impacts to foraging areas, with clearing minimised through micro-siting. As such, the amended project is unlikely to adversely affect habitat critical to the survival of the Blue-winged Parrot.

- *disrupt the breeding cycle of an important population*

The amended project would not disrupt a breeding cycle of an important population as the Blue-winged Parrot is not considered an important population within the Indicative disturbance footprint. In addition, the breeding range for the Blue-winged Parrot encompasses Tasmania, coastal south-eastern South Australia and southern Victoria. As such, a significant proportion of the breeding range for the species is outside of the Indicative disturbance footprint.

- *modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

Habitat within the Indicative disturbance footprint has been previously modified, and similar habitat occurs extensively within the local area. The amended project would result in localised habitat removal, with the majority of habitat spanned by transmission lines rather than cleared and impacts further reduced through micro-siting during detailed design.

The loss of habitat represents approximately 0.007% of the species' area of occupancy. Given the small scale of impact, the availability of extensive suitable habitat within the local area, and the mobility of the species, the amended project is unlikely to modify, destroy, remove, isolate or decrease the availability or quality of habitat to an extent that would cause the Blue-winged Parrot to decline.

- *result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat*

Due to past land uses invasive weeds and vertebrate pests such as rabbits, cats and foxes are already established within the landscape. Therefore, it unlikely the amended project would result in invasive species that are harmful to species becoming established. In addition, mitigation measures such as weed controls and hygiene protocols would be implemented to further minimise the impact of invasive species on habitat for the Blue-winged Parrot.

- *introduce disease that may cause the species to decline*

The Blue-winged Parrot is affected by Psittacine Beak and Feather Disease (PBFD) across the species entire distribution. The virus causing the disease has been identified in many wild populations and is believed to occur naturally. This disease is not considered likely to increase in the area because of the amended project and therefore is unlikely to cause the Blue-winged Parrot to decline.

- *interfere substantially with the recovery of the species*

There is currently no recovery plan for the Blue-winged Parrot, the approved conservation advice for the species identifies actions for the conservation and recovery of the species, including:

- establish new habitat patches in area where native vegetation cover is lacking.
- developing site-based fire management strategies with local authorities which considers the ecological needs of the species
- develop and implement strategies to increase hollow availability, including the protection of existing nesting habitat, developing nest box programs and the humane control of introduced species.

The amended project would result in the loss of some hollow-bearing trees; however, suitable habitat for the species is well represented within the surrounding locality. Clearing would be localised and largely limited to discrete infrastructure footprints, with impacts further reduced through micro-siting during detailed design.

To address impacts to hollow-bearing trees, a compensatory habitat strategy for hollow-dependent fauna would be prepared and implemented. This strategy would include:

- surveys of tree hollows and nests within proposed clearing areas, and assessment of hollow use and availability
- investigation of strategic placement of replacement hollows within the locality or region
- consideration of new and emerging monitoring techniques
- funding of targeted research to inform effective compensatory habitat measures relevant to project impacts; and
- measures to identify, manage and protect nests prior to clearing.

Given the availability of habitat in the surrounding landscape and the implementation of these measures, the amended project is unlikely to substantially interfere with the recovery of the Blue-winged Parrot.

B4.10.6 Conclusion

Based on the assessment above, including the limited scale of habitat removal, the mobility and distribution of the species, and the implementation of avoidance, minimisation and compensatory measures, the amended project is unlikely to have a significant impact on the Blue-winged Parrot.

B4.11 *Pedionomus torquatus* (Plains-wanderer)

Plains-wanderer is listed as critically endangered under the EPBC Act.

B4.11.1 Description

The Plains-wanderer are ground dwelling birds living in semi-arid, lowland native grasslands that typically occur on hard red-brown soils in Queensland, New South Wales, Victoria and South Australia. Habitat structure appears to play a more important role than plant species composition. Preferred grassland habitat of the Plains Wanderer typically comprises 50% bare ground, 10% fallen litter, and 40% herbs, forbs and grasses (TSSC, 2015). Surveys indicate that Plains Wanderers appear to avoid being in close proximity to living or dead trees, with no records of any birds within 300 m of trees of 10 m or greater in height across their strongholds in New South Wales and Victoria. In the Riverina region, the home range of individual Plains Wanderers vary in size from 7–21 hectares (DEWNR, 2016).

They feed on a mixture of seeds, leaves and invertebrates, with seeds and leaves accounting for nearly 60% of the annual diet. Seeds and leaves are taken from grasses (including native species of *Austrostipa, Sporobolus, Panicum, Austrodanthonia,* and *Eragrostis* and occasionally exotic species of *Vulpia*), chenopods (including species of *Atriplex, Maireana, Chenopodium* and *Sclerolaena*) and other plants (such as native species of *Asperula, Galium,* and *Euphorbia* and possibly exotic species of *Spergularia* and *Carthamus*). They occasionally occur in other types of habitats such as in stubble; amongst low cereal crops; and in low, sparse chenopod shrubland (DEWNR, 2016).

Plains-wanderers breed in solitary pairs, although may be polyandrous, and create nests in the ground in the form of a scrape lined with grass, amongst native grasses and herbs and sometimes crops (TSSC, 2015).

Threats to this species include:

- habitat loss and fragmentation as a result of land conversion for the cultivation of crops, including the introduction of pasture species, weeds, and woody vegetation
- inappropriate grazing, including both over and under grazing by domestic livestock and rabbits.
- low population size, which increases the risk of extinction
- predation by foxes, cats, and birds of prey
- pesticide use, particularly for the historical control of the Australian plague locust
- planting and natural recruitment of trees in or near native grasslands.

B4.11.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

A summary of the relevant Commonwealth guidelines and policy statements available for this species is as follows:

- Conservation advice: “Conservation Advice *Pedionomus torquatus* plains-wanderer” (DoE 2015). In effect under the EPBC Act from 08-Jul-2015
- Adopted/made recovery plan: “National Recovery Plan for the Plains-wanderer” (DoE & DEWNR, 2016). In effect under the EPBC Act from 28-Jun-2016.
- Threat abatement plans:
  - “Threat abatement plan for predation by feral cats 2024” {Commonwealth DCCEEW, 2024 #4656}. In effect under the EPBC Act from 24-Dec-2024.
  - “Threat abatement plan for competition and land degradation by rabbits” {Department of Environment and Energy, 2016 #3373}. In effect under the EPBC Act from 07-Jan-2017.

- "Threat abatement plan for predation, habitat degradation, competition and disease transmission by feral pigs (Sus scrofa) (2017)" {Department of the Environment and Energy, 2017 #3444}. In effect under the EPBC Act from 18-Mar-2017.
- "Threat abatement plan for predation by the European red fox" {Department of the Environment Water Heritage and the Arts, 2008 #2891}. In effect under the EPBC Act from 01-Oct-2008.

Table B.33 identifies the sections of the Revised BDAR where key information relating to the assessment and management of this species is presented.

Table B.33 Reference to relevant sections of the Revised BDAR for *Pedionomus torquatus*

Relevant section of the Revised BDAR
Methodology and survey effort – sections 2.3, 2.6, 5.4.2 and 5.4.3
Habitat Information – sections 5.1.1, 5.1.2, 5.2, 5.3 and 5.3.11
Impacts – sections 9.1.1, 9.1.5, 11.1.1, 11.1.2 and Chapter 12
Avoidance and Minimisation Measures – Chapter 8
Figures – Chapter 15

B4.11.3 Specific impacts

Plains-wanderer was recorded within the Indicative disturbance footprint and habitat for this species is associated with PCTs 44 and 46. The Plains-wanderer is a dual credit species and as a candidate species credit, has a habitat constraint restricted to Important Habitat Mapping in areas within the Indicative disturbance footprint, totalling 0.95 ha of impact. Additional impacts to the species as part of the ecosystem credit component of the NSW listing is based off of associated habitat types including PCT 44 and 46, which results in an addition 77.55 ha of impact. The amended project would result in the loss of 78.50 ha of combined habitat types for the species. Avoidance and mitigation measures for the species including special biodiversity protection zones are outlined in section 6 of this appendix and Chapter 8 of the Revised BDAR.

B4.11.4 Significant impact criteria

An action is likely to have a significant impact on an endangered or critically endangered species if there is a real chance or possibility that it will:

- *lead to a long-term decrease in the size of a population*

The recovery plan for the Plains-wanderer notes that the species is thought to occur in a single widely-dispersed population, rather than in multiple populations. The size of the Plains-wanderer population is considered to vary with seasonal conditions. The recovery plan notes that data collected between 2001 and 2014 shows an overall decline of 93% across the species range. The amended project would remove 78.50 ha of foraging and breeding habitat for the species. Given the sedentary nature of the species and small home range (approximately 7–21 ha), it is likely the amended project would lead to a long-term decrease in the size of the Plains-wanderer population.

- *reduce the area of occupancy of a population*

Plains-wanderer distribution was historically Queensland, NSW, South Australia and extending into Victoria. The extent of occurrence is estimated to be 930,000 km^2. However, the area of occupancy has been significantly reduced to 330 km^2 and a continuing decline. The species is found mainly in northern Victorian and Southern NSW, south western Queensland ad Northeast South Australia. The amended project would remove 78.50 ha of foraging and breeding habitat for the species. Given the sedentary nature of the species and small home range, it is likely the amended project would lead to a long-term decrease in the size of the Plains-wanderer population.

— *fragment an existing population into two or more populations*

The recovery plan for the Plains-wanderer notes that the species is thought to occur in a single widely-dispersed population, rather than in multiple populations. Given the nature of the amended project (transmission lines spanning habitat) it is unlikely the amended project would present a barrier to movement for the species. Therefore, it is unlikely the amended project would fragment an existing population into two or more.

— *adversely affect habitat critical to the survival of a species*

The recovery plan for the species identifies habitat critical to the survival of the species as any regions where the species is likely to occur and newly discovered locations that extend the likely range of the species. The Plains-wanderer is known to occur within the Indicative disturbance footprint; therefore, the amended project would impact on habitat critical to the survival of the species.

— *disrupt the breeding cycle of a population*

The nest is a hollow or 'scrape' that is scratched into the ground and lined with grass, with nests placed amongst native grasses and herbs, or rarely amongst crops. Breeding success is often linked to environmental conditions i.e. no breeding during drought. The amended project would result in the loss of 78.50 ha of habitat that may including breeding resources for the species. Therefore, there is a real chance or possibility that it the breeding cycle may be disrupted.

— *modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

The amended project would result in the removal of approximately 78.50 ha of foraging and breeding habitat for the Plains-wanderer. This loss would occur within a broader context where approximately 197,931.76 ha of associated habitat remains available within the local area and would not be impacted by the amended project.

The Plains-wanderer is a sedentary species with a small home range (approximately 7–21 ha), and therefore habitat loss at a local scale represents a sensitivity for the species. However, impacts would be spatially limited, and habitat removal would not eliminate all suitable habitat within the Indicative disturbance footprint or isolate remaining habitat from the broader landscape. Design measures to minimise disturbance to mapped important habitat and restrict impacts to discrete areas would further reduce the extent of habitat loss.

Given the proportion of habitat affected relative to availability in the local area, and the retention of suitable habitat beyond the amended project footprint, the amended project is unlikely to modify, destroy, remove or decrease habitat to an extent that would cause the Plains-wanderer population to decline.

— *result in invasive species that are harmful to a critically endangered species becoming established in the critically endangered species' habitat*

European foxes and feral cats are recognised invasive predators of the Plains-wanderer and are already present within the broader landscape. The amended project would not introduce new invasive species pathways, nor would it involve activities that are likely to increase the establishment or spread of these invasive predators within Plains-wanderer habitat.

While the construction of transmission infrastructure may create additional elevated structures within open grassland, native birds of prey such as the Spotted Harrier and Black Falcon are not invasive species, and their presence does not constitute the establishment of invasive species under the EPBC Act. Potential changes in raptor behaviour are therefore not relevant to this criterion.

Standard biosecurity and hygiene measures would be implemented during construction to minimise indirect disturbance and prevent the spread of invasive species into retained habitat. Accordingly, the amended project is unlikely to result in invasive species that are harmful to the Plains-wanderer becoming established in the species' habitat.

— *introduce disease that may cause the species to decline, or*

There are no known diseases causing potential species decline to the Plains-wanderer.

— *interfere substantially with the recovery of the species.*

The National Recovery Plan for the Plains-wanderer identifies six overarching strategies to guide recovery actions across the species' range, including enhancing protection, improving habitat condition, and increasing the extent of suitable habitat for the species (Commonwealth of Australia, 2016). These strategies are directed primarily at addressing broad-scale threats, including habitat loss, fragmentation, and degradation across key population strongholds.

The amended project would result in the loss of approximately 78.50 ha of Plains-wanderer habitat; however, this impact would be localised and would occur within a broader landscape where extensive suitable habitat remains available. The amended project has been designed to avoid mapped Important Plains-wanderer Habitat where practicable, restrict disturbance to discrete areas, and retain habitat beyond the Indicative disturbance footprint. These measures would reduce the potential for impacts that could undermine recovery efforts at a regional or population scale.

Given the scale and location of impacts relative to the species' remaining distribution and key recovery areas, the amended project is unlikely to substantially interfere with the recovery of the Plains-wanderer as defined in the National Recovery Plan.

B4.11.5 Conclusion

Based on the assessment above, the habitat loss for the Plains-wanderer is unlikely to result a significant residual impact on the Plains-wanderer.

B4.12 *Tringa nebularia* (Common Greenshank)

The Common Greenshank is listed as endangered under the EPBC Act.

B4.12.1 Description

The Common Greenshank is a migratory species which does not breed in Australia; however, the species occurs in all types of wetlands and has the widest distribution of any shorebird in Australia (Higgins & Davies 1996). In NSW, the species has been recorded in most coastal regions. It is widespread west of the Great Dividing Range, especially between the Lachlan and Murray Rivers and the Darling River drainage basin, including the Macquarie Marshes, and north-west regions (Higgins & Davies 1996).

The species uses both permanent and ephemeral terrestrial wetlands, including swamps, lakes, dams, rivers, creeks, billabongs, waterholes and inundated floodplains, claypans and saltflats. It would also use artificial wetlands, including sewage farms and saltworks dams, inundated rice crops and bores. The edges of the wetlands used are generally of mud or clay, occasionally of sand, and may be bare or with emergent or fringing vegetation, including short sedges and saltmarsh, mangroves, thickets of rushes, and dead or live trees. It was once recorded with Black-winged Stilts (*Himantopus himantopus*) in pasture but are generally not found in dry grassland (Higgins & Davies 1996).

B4.12.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

A summary of the relevant Commonwealth guidelines and policy statements available for this species is as follows:

- Conservation Advice: “Conservation Advice for *Tringa nebularia* (common greenshank). (Department of Climate Change, Energy, the Environment and Water, 2024)” In effect under the EPBC Act from 05-Jan-2024.
- Wildlife conservation plan: “Wildlife Conservation Plan for Migratory Shorebirds” {Commonwealth of Australia, 2015 #3336}. In effect under the EPBC Act from 15-Jan-2016.
- Marine Bioregional Plan: “Marine bioregional plan for the North-west Marine Region (Department of the Environment, 2015)” In effect under the EPBC Act from 27-Aug-2012.

Table B.34 identifies the sections of the Revised BDAR where key information relating to the assessment and management of this species is presented.

Table B.34 Reference to relevant sections of the Revised BDAR for *Tringa nebularia*

Relevant section of the Revised BDAR
Methodology and survey effort – sections 2.3 and 2.6
Habitat Information – not discussed in the Revised BDAR
Impacts – sections 9.1.1, 11.1.1 and Chapter 12
Avoidance and Minimisation Measures – Chapter 8
Figures – Chapter 15

B4.12.3 Specific impacts

Suitable habitat for the Common Greenshank has been assessed as moderately likely to occur within the Indicative disturbance footprint as the species has been recorded throughout the locality when conditions are favourable. Although it is not officially associated with any PCTs present within the Indicative disturbance footprint, habitats present may be considered suitable based on this species diverse habitat preferences. Impacts to aquatic habitats that support this species are generally limited to the removal or trimming of tree canopy on riverbanks to facilitate the construction and operation of the powerlines spanning riparian areas. Some minor impacts to in-stream areas will occur as part of the upgrading and creation of access tracks, however, these impacts are temporary and minor compared to the overall suitable habitat available to this species within the broader locality.

For the purpose of the assessment a precautionary maximum, disturbance of 0.19 ha has been considered. The amended project would avoid impacts to wetland and riparian habitats; however the species may be suspectable to increase risk of collision associated with the transmission lines.

B4.12.4 Specific impact criteria

An action is likely to have a significant impact on an endangered or critically endangered species if there is a real chance or possibility that it will:

- *lead to a long-term decrease in the size of a population*

The global population of the Common Greenshank is estimated at approximately 23,700 mature individuals, with population trends indicating an ongoing decline. Aquatic habitats most likely to be used by the species for foraging and roosting are unlikely to be directly impacted by the amended project, with potential impacts generally limited to the removal or trimming of tree canopy along riverbanks where transmission lines span riparian areas. However, where the species habitat occurs within areas of access track upgrades, direct impacts to the waterway may occur but these impacts are generally considered to be minor compared to overall habitat availability within the locality.

The primary potential impact pathway for the species is an increased risk of collision with transmission infrastructure during migratory or local flight movements. To reduce this risk, the amended project would implement conductor line-marking and bird diverters, with the placement and model refined during detailed design as part of a Connectivity Strategy. At a minimum, these measures would be applied within one kilometre of wetland and riverine habitats, where collision risk is greatest.

Given the limited extent of habitat disturbance, the highly mobile nature of the species, and the implementation of these targeted mitigation measures, it is unlikely that the amended project would lead to a long-term decrease in the size of the Common Greenshank population.

- *reduce the area of occupancy of the species*

Area of occupancy for the Common Greenshank is estimated at 13,000 km^2 and is deemed to be stable. Aquatic habitats most likely to be used by the species are unlikely to be directly impacted by the amended project. Given the species mobility, nature and scale of the impacts it is unlikely the amended project would reduce an area of occupancy for the species.

- *fragment an existing population into two or more populations*

The Common Greenshank population is not deemed to be severely fragmented. This species is highly mobile and capable of long-distance flight across other habitats to move between suitable habitats. The transmission lines may create a barrier to movement for the species. However, mitigation measure would be implemented to reduce risk of collision and to create connectivity in the landscape for avian species. including:

- conductor line-marking techniques would be implemented during design refinement to minimise bird strike
- to mitigate bird strike risk, bird diverters would be implemented. Positioning and exact diverter model would be finalised during design refinement and would be developed as part of a Connectivity Strategy. At minimum these would be used within one kilometre of wetland/riverine habitats to reduce impacts on aerial fauna species from collision and allow safer passage within these areas
- connectivity corridors involving native vegetation retention up to the 10 m or 20 m (for 330 kV and 500 kV lines, respectively) wide temporary construction centreline clearing zone to better facilitate woodland connectivity. Vegetation heights to be retained would be determined in accordance with vegetation clearing requirements at each location.

Therefore, it is considered unlikely that the amended project would introduce a barrier to movement, which would result in the south-eastern subpopulation being fragmented into two or more populations.

- *adversely affect habitat critical to the survival of a species*

Habitat critical to the survival of the Common Greenshank encompasses foraging and roosting habitats, including freshwater, marine and artificial wetlands. However, no specific habitat critical to the survival of the species has been formally identified in approved conservation advice.

While habitats within the Indicative disturbance footprint may be used opportunistically by the species when conditions are favourable, limited direct impacts to waterbodies or adjacent riparian habitats would occur. The majority of aquatic impact would be limited to the removal or trimming of tree canopy along riverbanks to facilitate the construction and operation of transmission lines spanning riparian areas. In areas subject to access track upgrades or creation, some minor in-stream work will be required which will have temporary and minor impacts to habitat. Wetland habitats would generally be avoided.

Any potential indirect impacts would be managed through project design and mitigation measures, including minimisation of vegetation removal at riparian crossings and the implementation of measures outlined in the Connectivity Strategy.

Given the absence of identified habitat critical to the survival of the species within the Indicative disturbance footprint, the limited and indirect nature of impacts, and the implementation of mitigation measures, it is unlikely that the amended project would adversely affect habitat critical to the survival of the Common Greenshank.

- *disrupt the breeding cycle of a population*

As Common Greenshank only occur in the Indicative disturbance footprint during the non-breeding season, the amended project would not disrupt the breeding cycle of the species.

- *modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

Aquatic habitats most likely to support the species are unlikely to be directly impacted by the amended project, with impacts generally limited to localised trimming or removal of riparian tree canopy where transmission lines span waterways. Some in-stream works will be required in areas of access track upgrades but are temporary and minor compared to overall habitat available within the locality. Therefore, the amended project is considered unlikely to result in the modification, removal, isolation, or decreased availability or quality of habitat to the extent that the species is likely to decline.

- *result in invasive species that are harmful to an endangered species becoming established in the endangered or critically endangered species' habitat*

The invasion of coastal habitats by mangroves and cordgrass is identified within approved conservation advice for the species. These habitats occur outside of the Indicative disturbance footprint. As such the amended project is considered unlikely to result in invasive species that are harmful to a species becoming established in the endangered species' habitat. In addition, mitigation measures such as hygiene protocols would be undertaken to minimise further invasive species from becoming established in the species habitat.

- *introduce disease that may cause the species to decline, or*

There are no known diseases causing potential species decline to the Common Greenshank. Mitigation measures including weed and pathogen controls would be put in place for the amended project which would minimise the introduction of any potential diseases.

- *interfere with the recovery of the species.*

Approved conservation advice for the Common Greenshank identifies recovery actions focused on minimising further loss of important habitat, improving knowledge of population trends and distribution, and supporting coordinated international management of migratory shorebirds. Key actions include reducing habitat loss across Australia, improving consistency in international management frameworks, and undertaking surveys to identify important habitats, particularly in northern and inland Australia.

The amended project would not preclude or hinder the implementation of these recovery actions. Aquatic habitats most likely to support the species are unlikely to be directly impacted by the amended project, with impacts generally limited to localised trimming or removal of riparian tree canopy where transmission lines span waterways. Some in-stream works will be required in areas of access track upgrades but are temporary and minor compared to overall habitat available within the locality. These impacts would not affect habitat at a scale relevant to national or international recovery objectives. The amended project would not significantly interfere with conservation and recovery actions put forth for the Common Greenshank.

B4.12.5 Conclusion

Aquatic habitats most likely to support the species are unlikely to be directly impacted by the amended project, with impacts generally limited to localised trimming or removal of riparian tree canopy where transmission lines span waterways. Some in-stream works will be required in areas of access track upgrades but are temporary and minor compared to overall habitat available within the locality. Given the species' high mobility, the availability of suitable habitat within the surrounding locality and region, and the avoidance of wetland habitats, these impacts are unlikely to significantly affect the species.

The implementation of mitigation measures identified in the Revised BDAR, including measures to reduce collision risk associated with transmission infrastructure, would further minimise potential impacts. On this basis, it is unlikely that the amended project would result in a significant residual impact on the Common Greenshank.

B4.13 *Polytelis swainsonii* (Superb Parrot)

Superb Parrot is listed as vulnerable under the EPBC Act.

B4.13.1 Description

The Superb Parrot is a distinctive large, bright grass-green parrot with a long, narrow tail and sharply back-angled wings in flight. The Superb Parrot is found throughout central to south-eastern inland NSW. On the South-western Slopes their core breeding area is roughly bounded by Cowra and Yass in the east, and Grenfell, Cootamundra and Coolac in the west. The other main breeding sites are in the Riverina along the corridors of the Murray, Edward and Murrumbidgee Rivers where birds are present all year round. Superb Parrots inhabit Box-Gum, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest. In the Riverina the birds nest in the hollows of large trees (dead or alive) in mainly tall riparian River Red Gum Forest or Woodland between September and January. This species typically forages up to 10 km from nesting sites, primarily in grassy Box-Gum Woodland.

B4.13.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

A summary of the relevant Commonwealth guidelines and policy statements available for these species is as follows:

- Conservation advice: "Conservation Advice *Polytelis swainsonii* superb parrot" (TSSC 2016). In effect under the EPBC Act from 02-May-2016
- Recovery plan: "National Recovery Plan for the Superb Parrot (*Polytelis swainsonii*)", Commonwealth of Australia 2021.

Table B.35 identifies the sections of the Revised BDAR where key information relating to the assessment and management of this species is presented.

Table B.35 Reference to relevant sections of the Revised BDAR for *Polytelis swainsonii*

Relevant section of the Revised BDAR
Methodology and survey effort – sections 2.3, 2.6, 5.4.2 and 5.4.3
Habitat Information – sections 5.1.1, 5.1.2, 5.2, 5.3 and 5.3.15
Impacts – sections 9.1.1, 9.1.5, 11.1.1, 11.1.2 and Chapter 12
Avoidance and Minimisation Measures – Chapter 8
Figures – Chapter 15

B4.13.3 Specific impacts

The species was recorded in the Indicative disturbance footprint within the Inland Slopes IBRA sub-region in September and December 2025, and BioNet records have identified individuals of this species within the Indicative disturbance footprint. Additionally, extensive suitable habitat for this species occurs within the Indicative disturbance footprint in association with PCTs 7, 10, 11, 13, 26, 237, 266, 277 & 343. The amended project is expected to clear a total of 1.08 ha of assumed suitable breeding habitat for the species in areas not subject to adequate targeted survey effort.

B4.13.4 Is this part of an important population?

The Superb Parrot has previously been recorded within the Indicative disturbance footprint alongside being recorded during survey in the Inland Slopes IBRA sub-region. It is considered likely for the Superb Parrot to utilise habitats within the Indicative disturbance footprint for foraging and, potentially, breeding. Portions of the amended project, particularly toward the eastern extent near Wagga Wagga, occur in close proximity to known important breeding areas along the Murrumbidgee River.

The amended project area is located between two recognised breeding populations and is therefore likely to support individuals moving between these areas. Such movements are important for maintaining connectivity and genetic exchange between breeding populations. While the presence of an important population within the Indicative disturbance footprint has not been confirmed, the location and extent of suitable habitat indicate that the amended project area may support individuals that form part of a broader important population of the Superb Parrot.

B4.13.5 Significant impact criteria

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

- *lead to a long-term decrease in the size of an important population*

The most recent population estimates for the Superb Parrot range from approximately 10,000–20,000 mature individuals across New South Wales and Victoria. While the amended project would result in the removal of approximately 1.08 ha of assumed breeding habitat, this represents a small proportion of habitat available to the species within the local area (74,098.74 ha). Due to the size of habitat impacted by the amended project, it is unlikely to impact local populations which use these areas as connectivity corridors between breeding locations. Further, it will not significantly inhibit individuals dispersing between nearby breeding populations.

Project design measures and mitigation committed to in the Revised BDAR, including micro-siting of infrastructure, retention of vegetation where practicable, and measures to reduce collision risk associated with transmission infrastructure, would reduce potential impacts on individuals moving through the landscape.

Accordingly, it is unlikely that the amended project would lead to a long term decrease in the size of an important population of the Superb Parrot.

- *reduce the area of occupancy of an important population*

The amended project would result in the removal of 1.08 ha of assumed breeding habitat. This represents a small proportion of habitat available to the species within the local area (74,098.74 ha).

The national recovery plan for the species outlines that actions that remove habitat critical to the survival of the Superb Parrot will likely interfere with the recovery of the species and reduce the area of occupancy of the species. Habitat critical to the survival of the Superb Parrots as listed in this plan includes breeding habitat, foraging habitat and habitat for the long-term maintenance of the species. Breeding habitat includes box gum woodlands in the NSW slopes and tablelands and is noted may include known breeding colonies within a 10km buffer zone (known breeding colonies occur along the Murrumbidgee River). Foraging habitat includes all preferred foraging habitat in both the breeding and non-breeding season.

Given the amended project is not likely to impact on habitat critical to the survival of the species, it is unlikely that the amended project would reduce the area of occupancy of an important population.

- *fragment an existing important population into two or more populations*

The population of the Superb Parrot is already highly fragmented in this area, with core breeding areas separated by vast areas of agricultural land. The removal of small fragments of suitable habitat within an already heavily fragmented landscape is therefore not expected to increase levels of population fragmentation in this area, though there may be slight increase in habitat fragmentation on a localised scale.

- *adversely affect habitat critical to the survival of a species*

Habitat critical to the survival of the Superb Parrot is divided into the following in the National Recovery Plan:

- Breeding habitat:
  - riverine forests in the Riverina/box-gum woodlands in tablelands and slopes of Victoria, NSW and ACT
  - any known breeding colonies + 10 km where feasible
  - trees with DBH ~113 cm and height 12–24 m, containing hollows with: diameter 8–12 cm, depth 59–122 cm, floor diameter 15–22 cm, and located on a branch or stem with a diameter of 36–49 cm.
- Foraging habitat: All preferred foraging habitat during both breeding and non-breeding season. This does not include exotic feeding grounds such as agricultural lands and non-native feeding grounds.
- Habitat for the long-term maintenance of the species:
  - all KBAs (Key Biodiversity Areas) with the Superb Parrot as a Trigger species
  - any potential suitable foraging and breeding habitats within the projected south-eastward range shift (Manning et al. in review).

The Wagga-Gugaa section of the project sits within the South-west Slopes of NSW KBA (Birdlife Australia, 2025). This section of the amended project is also within 10 km of a known important breeding location for the species (Murrumbidgee River). However, the extent of habitat to be impacted by the amended project is insignificant in comparison to the habitat represented in the locality. As such, the project works within this area are not likely to adversely affect habitat critical to the survival of the Superb Parrot.

- *disrupt the breeding cycle of an important population*

During targeted surveys, individuals were recorded within the Inland Slopes IBRA sub-region in September and December of 2025. Hollow-dependent threatened bird habitat assessments were also undertaken to identify hollows and potential breeding habitat features. No breeding individuals were recorded during these surveys, and it is unlikely that breeding currently occurs within the Indicative disturbance footprint. Areas impacted by the amended project are only assumed to be suitable breeding habitat due to a lack of adequate targeted survey effort.

However, it is noted that the Wagga-Gugaa section of the amended project is within 10 km of a known important breeding location for the species (Murrumbidgee River) and likely supports dispersion between two known breeding locations. As such, it is not likely that the amended project will disrupt the breeding cycle of an important population of the Superb Parrot.

- *modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

The amended project is predicted to remove 1.08 ha of assumed breeding habitat for the species. This removal will occur within box gum woodland habitat which is already highly fragmented within the region. Despite this fragmentation, however, known breeding activity occurs along the Murrumbidgee River, within 10km of the Indicative disturbance footprint and individuals have been observed flying over the Indicative disturbance footprint and using habitat within 30 m of the Indicative disturbance footprint. It is possible that habitat within the Indicative disturbance footprint is used by the local population for foraging purposes and to some extent as a linkage between suitable breeding areas along the riparian areas to the north and south. However, the mobility of the species and mitigation measures in place for the small section of associated habitat impacted means the amended project is not likely to contribute to further modify, destroy, remove, isolate, or decrease the availability or quality of Superb Parrot habitat to an extent that would cause the species to decline.

- *result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat*

Invasive species are not currently listed as a threat to this species. The amended project would be undertaken within an already modified agricultural landscape where invasive species are generally present. Construction would implement standard biosecurity and hygiene measures (e.g. controls on vehicle movement and imported materials and minimisation of unnecessary disturbance) to reduce the potential for introducing or spreading invasive species into retained habitat. The amended project is therefore unlikely to result in invasive species that are harmful to the Superb Parrot becoming established in the species' habitat.

- *introduce disease that may cause the species to decline*

The Superb Parrot may be susceptible to diseases such as *Psittacine Circovirus* Disease (PCD). This can be spread between individuals and increased due to increased competition for nest hollows. No breeding activity was recorded within the Indicative disturbance footprint despite surveys during the breeding season. The project will remove suitable foraging habitat as well as hollow-bearing trees, however, given known breeding areas occur several kilometres from the Indicative disturbance footprint, it is unlikely that this effect would be significant to the extent that it may lead to disease transmission that would cause the decline of the species.

- *interfere substantially with the recovery of the species*

The following strategies are listed in the National Recovery Plan for the Superb Parrot:

- identify, protect, manage and strategically restore Superb Parrot breeding, foraging and movement habitats, at the local, regional and landscape scales
- define, monitor, reduce and manage threats to the Superb Parrot at the local, regional and landscape scales
- expand and sustain ecologically meaningful monitoring to track changes in Superb Parrot distribution, habitat use and population size, including developing and applying techniques to measure the success of recovery actions
- improve understanding of Superb Parrot movement ecology across multiple scales to better target protection and restoration measures
- engage local communities and stakeholders in Superb Parrot conservation
- coordinate, review and report on Superb Parrot recovery progress.

The amended project has an insignificant impact on associated habitat for the species, which is abundant across the locality of the Indicative disturbance footprint. Further, the amended project would not significantly impact upon the species movement between identified breeding locations, ultimately not interfering with the recovery of the species.

B4.13.6 Conclusion

The Superb Parrot is known to occur within the Indicative disturbance footprint due individuals recorded during targeted survey, including areas within 10 km of known breeding locations along the Murrumbidgee River. The amended project would result in the removal of approximately 1.08 ha of assumed breeding habitat, which is unlikely to reduce the area of occupancy for the species or interfere with recovery.

Considering this, it is not likely that the amended project would have a significant impact on the Superb Parrot.

B4.14 *Rostratula australis* (Australian Painted Snipe)

The Australian Painted Snipe is listed as Endangered under the EPBC Act.

B4.14.1 Description

The Australian Painted Snipe is a small freshwater wader that breeds in shallow, temporary or infrequently filled freshwater or brackish wetlands following flooding, preferring wetlands with complex shorelines and a patchwork of shallow water, small islands, exposed wet mulch, and low, dense cover (less than knee height). During non-breeding periods they have also been recorded in wetlands where there are trees or shrubs or samphire, and occasionally brackish wetlands, saltmarsh, claypans, sewage farms, dams, bores and irrigation schemes where they feed on seeds and invertebrates, including insects, worms, molluscs and crustaceans from the water's edge.

The species is restricted to Australia. Most records are from the southeast, particularly the Murray Darling Basin, with scattered records across northern Australia and historical records from around the Perth region in Western Australia. In NSW many records are from the Murray-Darling Basin including the Paroo wetlands, Lake Cowal, Macquarie Marshes, Fivebough Swamp and more recently, swamps near Balldale and Wanganella. Other important locations with recent records include wetlands on the Hawkesbury River and the Clarence and lower Hunter Valleys.

B4.14.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

The relevant Commonwealth guidelines and policy statements available for this species include:

- Conservation advice: “Approved conservation advice for *Rostratula australis* (Australian Painted Snipe).” Canberra 2013: Department of Climate Change, Energy, the Environment and Water.
- Threat abatement plan: “Threat abatement plan for predation by feral cats 2024” {Commonwealth DCCEEW, 2024 #4656}. Canberra: Commonwealth of Australia. In effect under the EPBC Act from 24-Dec-2024.

Table B.36 identifies the sections of the Revised BDAR where key information relating to the assessment and management of this species is presented.

Table B.36 Reference to relevant sections of the Revised BDAR for *Rostratula australis*

Relevant section of the Revised BDAR
Methodology and survey effort – sections 2.3, 2.6 and 5.4.3
Habitat Information – sections 5.1.1 and 5.2
Impacts – sections 9.1.1, 11.1.1 and Chapter 12
Avoidance and Minimisation Measures – Chapter 8
Figures – Chapter 15

B4.14.3 Specific impacts

Whilst the Australian Painted Snipe was not recorded during surveys, the Indicative disturbance footprint is within the known distribution of this species. Associated PCTs of the Australian Painted Snipe within the Indicative disturbance footprint include: PCT 7, 10, 11, 13, 17, 24, 47, 53, and 160. This contributes to a total of 254.72 ha of associated habitat for the species present in the Indicative disturbance footprint.

Limited direct impact to waterbodies or adjacent riparian habitats is expected, as impacts on aquatic habitat would largely be restricted to the removal or trimming of tree canopy on riparian areas to facilitate the construction and operation of the powerlines spanning riparian areas. Areas associated with access track upgrades or creation will potentially require minor in-stream works. These impacts are considered to be temporary, and minor compared to the overall habitat available to

the species within the broader locality. The amended project would avoid impacts to wetland and riparian habitats and where impacts did occur they would be temporary and minor; however, the species may be suspectable to increase risk of collision associated with the transmission lines.

B4.14.4 Significant impact assessment

An action is likely to have a significant impact on an endangered or critically endangered species if there is a real chance or possibility that it will:

- *lead to a long-term decrease in the size of a population*

As of 2012 the estimated population size of the Australian Painted Snipe was 2500 mature individuals (DCCEEW 2013). The estimate was revised down in 2020 to 270-410 mature individuals with a best estimate of 340 (Birdlife International 2022). The species was not recorded within the Indicative disturbance footprint despite targeted ecological surveys.

Preferred habitats most likely to support the species are unlikely to be directly impacted by the amended project, with impacts generally limited to localised trimming or removal of tree canopy along riverbanks. However, where the species habitat occurs within areas of access track upgrades, direct impacts to the waterway may occur but these impacts are generally considered to be minor compared to overall habitat availability within the locality.

As the Australian Painted Snipe is a migratory species, birds may be at risk of powerline strike during flight movements, however mitigation measures are in place to minimise collision risk by increasing visibility of power lines. Conductor line-marking measures, including bird diverters, would be incorporated during design refinement, prioritising areas within one kilometre of wetland and riverine habitats. As such, the amended project is unlikely to affect the population at a scale that would result in a long-term decrease.

- *reduce the area of occupancy of a population*

As of 2011, the Area of occupancy for the Australian Painted Snipe was estimated to be 2000 square kilometres; however, may be higher due to favourable weather events (DCCEEW 2013). The species is widespread and not considered to have a limited geographical distribution. Preferred habitats most likely to support the species are unlikely to be directly impacted by the amended project, with impacts generally limited to localised trimming or removal of tree canopy along riverbanks. However, where the species habitat occurs within areas of access track upgrades, direct impacts to the waterway may occur but these impacts are generally considered to be minor compared to overall habitat availability within the locality. Given the species mobility and extent of habitat within the Indicative disturbance footprint, it is unlikely the amended project would reduce an area of occupancy for the species.

- *disrupt the breeding cycle of a population*

The Australian Painted Snipe nests on the ground amongst tall vegetation, such as grasses, tussocks or reeds. Breeding is often in response to local conditions, generally occurring from September to December. The species was not recorded during targeted ecological surveys, and no evidence of breeding or nesting habitat was identified within the Indicative disturbance footprint.

Preferred aquatic habitats most likely to support the species are unlikely to be directly impacted by the amended project, with impacts generally limited to localised trimming or removal of tree canopy along riverbanks. However, where the species habitat occurs within areas of access track upgrades, direct impacts to the waterway may occur but these impacts are generally considered to be minor compared to overall habitat availability within the locality. This is unlikely to affect the breeding cycle for the species, as the total associated habitat of 254.72 ha is classified as foraging or wading habitat. As such, the amended project is unlikely to disrupt the breeding cycle of the Australian Painted Snipe.

- *fragment an existing population into two or more populations*

The Australian Painted Snipe population is not geographically limited or fragmented. This species is mobile between preferred habitats, moving based on local conditions. The transmission lines are unlikely to create a barrier to movement for the species. Regardless, mitigation measure would be implemented to reduce risk of collision and to create connectivity in the landscape for avian species including:

- conductor line-marking techniques would be implemented during design refinement to increase visibility of power lines
- to mitigate bird strike risk, bird diverters would be implemented. Positioning and exact diverter model would be finalised during design refinement and would be developed as part of a Connectivity Strategy. At minimum these would be used within one kilometre of wetland/riverine habitats to reduce impacts on aerial fauna species from collision and allow safer passage within these areas
- connectivity corridors involving native vegetation retention up to the 10 m or 20 m wide (for 330 kV and 500 kV lines, respectively) temporary construction centreline clearing zone to better facilitate woodland connectivity. Vegetation heights to be retained would be determined in accordance with vegetation clearing requirements at each location.

Therefore, it is considered unlikely that the amended project would introduce a barrier to movement for the Australian Painted Snipe that would result in the fragmentation of an existing population.

- *adversely affect habitat critical to the survival of a species*

Habitat critical to the survival of the Australian Painted Snipe encompasses foraging and wading habitats, including shallow and occasionally brackish wetlands; both ephemeral and permanent. However, no specific habitat critical to the survival of the species has been formally identified in approved conservation advice.

While habitats within the Indicative disturbance footprint may be used opportunistically by the species when conditions are favourable, limited direct impacts to waterbodies or adjacent riparian habitats would occur.

Any potential indirect impacts would be managed through project design and mitigation measures, including minimisation of vegetation removal at riparian crossings and the implementation of measures outlined in the Connectivity Strategy.

Given the absence of identified habitat critical to the survival of the species within the Indicative disturbance footprint, the limited and indirect nature of impacts, and the implementation of mitigation measures, it is unlikely that the amended project would adversely affect habitat critical to the survival of the Australian Painted Snipe.

- *modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

Aquatic habitats most likely to support breeding are unlikely to be directly impacted by the amended project, with impacts generally limited to localised trimming or removal of riparian tree canopy where transmission lines span waterways. Some in-stream works will be required in areas of access track upgrades but are temporary and minor compared to overall habitat available within the locality. Therefore, the amended project is considered unlikely to result in the modification, removal, isolation, or decreased availability or quality of habitat to the extent that the species is likely to decline.

- *result in invasive species that are harmful to a vulnerable species becoming established in the endangered*

Invasive species are present throughout the landscape, and it is considered unlikely that the amended project would substantially change the composition of the species' habitat within the landscape or increase the spread and establishment of invasive species (i.e., predators) that could threaten the survival of the species. As such the amended project is considered unlikely to result in invasive species that are harmful to Australian Painted Snipe becoming established in the species' habitat. In addition, mitigation measures such as hygiene protocols would be undertaken to minimise further invasive species from becoming established in the species habitat.

- *introduce disease that may cause the species to decline*

There are no known diseases causing potential species decline to the Australian Painted Snipe. Mitigation measures including weed and pathogen controls would be put in place for the amended project which would minimise the introduction of any potential diseases.

- *interfere substantially with the recovery of the species*

Approved conservation advice for the Australian Painted Snipe identifies recovery actions focused on mitigating habitat loss, disturbance and modification, mitigating the impacts of trampling and grazing, alongside animal predation. Research priorities for the species include monitoring population size, distribution and relative impacts, as well as monitoring breeding and non-breeding behaviours.

The amended project would not preclude or hinder the implementation of these recovery actions. Limited direct impacts to waterbodies or wetland habitats would occur, and potential impacts are generally limited to minor and localised canopy trimming at riparian crossings. Where in-stream works are required for access track upgrades, impacts are considered temporary and minor compared to the overall habitat available to the species within he broader locality. These impacts would not affect habitat at a scale relevant to national or international recovery objectives. The amended project would not significantly interfere with conservation and recovery actions put forth for the Australian Painted Snipe.

B4.14.5 Conclusion

Limited direct impacts to waterbodies or wetland habitats preferred by Australian Painted Snipe would occur as a result of the amended project. Given the species' mobility on a local scale, the availability of suitable habitat within the surrounding locality and region, and the avoidance of associated wetland habitats, these impacts are unlikely to significantly affect the Australian Painted Snipe.

The implementation of mitigation measures identified in the amended BDAR, including measures to reduce collision risk associated with transmission infrastructure, would further minimise potential impacts. On this basis, it is unlikely that the amended project would result in a significant residual impact on the Australian Painted Snipe.

B4.15 *Lathamus discolor* (Swift Parrot)

The Swift Parrot is listed as Critically Endangered under the EPBC Act.

B4.15.1 Description

The Swift Parrot is a migratory species which breeds in Tasmania during summer months before the entire population migrating north to mainland Australia across winter. During summer breeding months, the breeding range of the species is restricted to the east and south-east of Tasmania, closely mirroring the distributing of Blue Gum (*Eucalyptus globulus*). Once migrated to the mainland, the Swift Parrot distribution occurs mainly across Victoria and New South Wales to forage on flowers and *Psyllid* lerps. In New South Wales, the species is forage in forests and woodlands throughout the coast and western slopes annually. Further, coastal regions tend to support larger numbers of birds when inland habitats are subject to drought.

B4.15.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

The relevant Commonwealth guidelines and policy statements available for this species include:

- Conservation advice: "Conservation advice *Lathamus discolor* swift parrot." Canberra 2016: Department of Climate Change, Energy, the Environment and Water.
- Threat abatement plan: "Threat abatement plan for predation by feral cats 2024" {Commonwealth DCCEEW, 2024 #4656}. Canberra: Commonwealth of Australia. In effect under the EPBC Act from 24-Dec-2024.
- Recovery Plan: "National Recovery Plan for the Swift Parrot (*Lathamus discolor*). (2024) Department of Climate Change, Energy, the Environment and Water. In effect under the EPBC Act from 30-Apr-2024.

Table B.37 identifies the sections of the Revised BDAR where key information relating to the assessment and management of this species is presented.

Table B.37 Reference to relevant sections of the Revised BDAR for *Lathamus discolor*

Relevant section of the Revised BDAR
Methodology and survey effort – sections 2.3, 2.6, 5.4.2 and 5.4.3
Habitat Information – sections 5.1.1, 5.1.2, 5.2 and 5.3
Impacts – sections 9.1.1, 9.1.5, 11.1.1, 11.1.2 and Chapter 12
Avoidance and Minimisation Measures – Chapter 8
Figures – Chapter 15

B4.15.3 Specific impacts

Whilst Swift Parrot has not been recorded during surveys, the Indicative disturbance footprint is within the known distribution of this species. Associated PCTs of the Swift Parrot within the indicative disturbance footprint include: 7, 10, 11, 13, 15, 24, 26, 86, 237, 266, 277, 319 & 343. The amended project would result in the loss of 373.93 ha of foraging habitat for the Swift Parrot. No breeding habitat or assumed breeding habitat has been identified within the Indicative disturbance footprint. A portion of this impact includes potential impact associated with risk of collision with lines and EMF impacts with new infrastructure as noted in section 9.2.3 of the Revised BDAR.

B4.15.4 Significant impact assessment

An action is likely to have a significant impact on an endangered or critically endangered species if there is a real chance or possibility that it will:

- *lead to a long-term decrease in the size of a population*

It is estimated that in 2010, approximately 2,000 mature individuals were present in the wild, however, due to a decreasing trend, it was estimated that 750 mature individuals remained in 2021. The amended project would result in the loss of 373.93 ha of foraging habitat for the species. Swift Parrot is not known to reliably return to foraging habitat in consecutive years, rather moving in tandem with foraging resources. As the species is not bound to specific locations annually and the size of foraging habitat loss is not significant in comparison to available habitat in the locality, it is unlikely to lead to a significant decrease in a population of Swift Parrot.

- *reduce the area of occupancy of a population*

As the species have temporal and spatially variable long-distance movements, determining the area of occupancy for the species is challenging. As stated in the approved conservation advice, using a range of methods by combining foraging habitat and adjusted mature forest estimates, the area of occupancy for Swift Parrots was estimated to range from 18.5km^2 to 335 km^2 between 2009 and 2014. Further, evidence suggests a continuing decline in the area of occupancy of the species. The amended project will impact 373.93 ha (3.73 km^2) of foraging habitat which may reduce the area of occupancy for the species.

- *disrupt the breeding cycle of a population*

The Swift Parrot is a migratory species which breeds in Tasmania during the summer, using habitat in the indicative disturbance footprint exclusively for foraging. As such, the amended project will not disrupt the breeding cycle of a population of Swift Parrot.

- *fragment an existing population into two or more populations*

The maximum cleared area for individual tower footprints or laydown areas would not exceed approximately 0.5 ha, and the transmission line easement would be up to approximately 200 m wide, allowing for micro-siting to avoid significant environmental constraints. The linear nature of the amended project means that clearing would be discontinuous, with large areas of habitat retained between infrastructure elements. While transmission lines have the potential to pose a collision risk to individual birds, the Swift Parrot is a highly mobile species crossing wide ranges during annual migration.

Mitigation measures will be implemented to reduce the risk of collision and promote movement, including conductor line-marking and bird diverters in areas of elevated risk, particularly near wetland and riparian habitats. As such, the amended project is unlikely to lead to fragmenting an existing population of Swift Parrot into two or more populations.

- *adversely affect habitat critical to the survival of a species*

Habitat critical to the survival of the Swift Parrot is identified in the approved National Recovery Plan, and states in relation to foraging habitat on the Australian mainland:

- all preferred foraging species within known and likely foraging habitat on the mainland including Yellow Gum (*E. leucoxylon*); Red Ironbark (*E. tricarpa*); Mugga Ironbark (*E. sideroxylon*); Grey Box (*E. macrocarpa*); White Box (*E. albens*); Yellow Box (*E. melliodora*); Swamp Mahogany (*E. robusta*); Forest Red Gum (*E. tereticornis*); Blackbutt (*E. pilularis*); and Spotted Gum (*Corymbia maculata*).

The loss of 373.93 ha of foraging habitat, which includes the preferred foraging species listed above, may adversely affect habitat critical to the survival of the species.

- *modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

The amended project would result in the loss of habitat for the Swift Parrot; however, this habitat has been previously modified and occurs within a landscape where similar habitat remains widespread. Clearing would be largely limited to discrete infrastructure footprints, with the majority of habitat spanned by transmission lines and subject to micro-siting to minimise impacts.

The scale, condition and spatial extent of impact, combined with the mobility of the species and the availability of extensive habitat in the surrounding locality, mean the amended project is unlikely to modify, destroy, remove or isolate habitat to an extent that would cause the Swift Parrot population to decline.

- *result in invasive species that are harmful to a vulnerable species becoming established in the endangered*

Introduced pest species are already present throughout the broader landscape. The amended project would not introduce new invasive species pathways or substantially alter existing habitat conditions in a manner that would promote the establishment of invasive species harmful to the Swift Parrot.

Implementation of standard biosecurity and hygiene measures during construction, including controls on vehicle movement, equipment cleaning and management of disturbed areas, would further reduce the likelihood of invasive species spread. Accordingly, the amended project is unlikely to result in invasive species harmful to the Swift Parrot becoming established in the species' habitat.

- *introduce disease that may cause the species to decline*

The key disease likely to impact these species is *Psittacine Circovirus* Disease (PCD). The disease is believed to have evolved with wild psittacines and is widespread in wild psittacines, including many common Australian species. Noting PCD is already within the landscape and given the nature and scale of the amended project it is unlikely it would introduce a disease that may cause Swift Parrot to decline.

- *interfere substantially with the recovery of the species*

The current National Recovery Plan for the Swift Parrot was published in 2024, and states several objectives, strategies and actions specific to the species:

- by 2032, maintain or improve the extent, condition and connectivity of habitat of the Swift Parrot
- maintain known Swift Parrot breeding and foraging habitat at the local, regional and landscape scales
- enhance the quality and extent of existing breeding habitat in Tasmania through strategic plantings.

The loss of 373.93 ha of potential foraging habitat for the Swift Parrot will impact foraging habitat at the local scale. However, the linear nature of the amended project means that clearing would be discontinuous, with large areas of habitat retained between infrastructure elements at the local scale. The amended project is unlikely to significantly interfere with the recovery of the species.

B4.15.5 Conclusion

The amended project would result in the removal of approximately 373.93 ha of foraging habitat for the Swift Parrot, including some habitat which may led to the decrease in the area of occupancy for the species. However, these impacts would be localised and occur within a landscape where extensive suitable habitat remains available.

When considered in the context of the species' distribution, mobility, migratory tendencies and the implementation of avoidance, minimisation and compensatory measures, the amended project is unlikely to result in a significant impact on the Swift Parrot.

B4.16 *Calidris acuminata* (Sharp-tailed Sandpiper)

The Sharp-tailed Sandpiper is listed as vulnerable under the EPBC Act.

B4.16.1 Description

The Sharp-tailed Sandpiper spends the non-breeding season in Australia with small numbers occurring regularly in New Zealand. Most of the population migrates to Australia, mostly to the south-east and are widespread in both inland and coastal locations and in both freshwater and saline habitats. Many inland records are of birds on passage. They are widespread in most regions of New South Wales (NSW) and Victoria, especially in coastal areas, but they are sparse in the south-central Western Plain and east Lower Western Regions of NSW, and north-east and north-central Victoria.

In Australasia, the Sharp-tailed Sandpiper prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline salt lakes inland. They also occur in saltworks and sewage farms. They use flooded paddocks, sedgelands and other ephemeral wetlands, but leave when they dry. They use intertidal mudflats in sheltered bays, inlets, estuaries or seashores, and swamps and creeks lined with mangroves. They tend to occupy coastal mudflats mainly after ephemeral terrestrial wetlands have dried out, moving back during the wet season. They may be attracted to mats of algae and water weed either floating or washed up around terrestrial wetlands, and coastal areas with much beach-cast seaweed. Sometimes they occur on rocky shores and rarely on exposed reefs.

They forage at the edge of the water of wetlands or intertidal mudflats, either on bare wet mud or sand, or in shallow water. They also forage among inundated vegetation of saltmarsh, grass or sedges. They forage in sewage ponds, and often in hypersaline environments. After rain, they may forage in paddocks of short grass, well away from water.

Roosting occurs at the edges of wetlands, on wet open mud or sand, in shallow water, or in short sparse vegetation, such as grass or saltmarsh. Occasionally, they roost on sandy beaches, stony shores or on rocks in water. They have also been recorded roosting in mangroves.

The Sharp-tailed Sandpiper forages on seeds, worms, molluscs, crustaceans and insects. They are also reported to eat arachnids and dead fish.

B4.16.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

A summary of the relevant Commonwealth guidelines and policy statements available for this species is as follows:

- Conservation advice: “Conservation Advice for *Calidris acuminata* (sharp-tailed sandpiper) (Department of Climate Change, Energy, the Environment and Water, 2024).” In effect under the EPBC Act from 05-Jan-2024.
- Wildlife conservation plan: “Wildlife Conservation Plan for Migratory Shorebirds” {Commonwealth of Australia, 2015 #3336}. In effect under the EPBC Act from 15-Jan-2016.
- Threat Abatement Plan: “Threat abatement plan for predation by feral cats 2024.” {Commonwealth DCCEEW, 2024 #4656}. In effect under the EPBC Act from 24-Dec-2024.

Table B.38 identifies the sections of the Revised BDAR where key information relating to the assessment and management of this species is presented.

Table B.38 Reference to relevant sections of the Revised BDAR for *Calidris acuminata*

Relevant section of the Revised BDAR
Methodology and survey effort – sections 2.3 and 2.6
Habitat Information – not discussed in the Revised BDAR
Impacts – sections 9.1.1, 11.1.1 and Chapter 12
Avoidance and Minimisation Measures – Chapter 8
Figures – Chapter 15

B4.16.3 Specific impacts

The Sharp-tailed Sandpiper has been assessed as moderately likely to occur within the Indicative disturbance footprint as it has been recorded within various habitat types and consistently throughout the locality when conditions are favourable. Although it is not associated with any present PCTs officially, habitats present may be considered suitable based on this specie's diverse habitat preferences. Limited direct impact to waterbodies or adjacent riparian habitats is expected, as aquatic impact would be largely restricted to the removal or trimming of tree canopy on riverbanks to facilitate the construction and operation of the powerlines spanning riparian areas. Where in-stream works are required for access track upgrades or creation, impacts will be temporary and minor compared to overall habitat available to the species within the broader locality. No specific PCTs have been identified as associated habitat for this species by the TBDC and for the purpose of the assessment a precautionary maximum, disturbance of 0.19 ha has been considered. The species may also be at risk of collision associated with the transmission line.

B4.16.4 Is this part of an important population?

In accordance with the Matters of National Environmental Significance – Significant Impact Guidelines 1.1 (Department of the Environment Water Heritage and the Arts 2013), the presence of an important population must be identified prior to addressing the significance impact criteria. An important population is defined in the Significant Impact Guidelines as a population that is necessary for a species' long-term survival and recovery. Under the Act, important populations are:

- likely to be key source populations either for breeding or dispersal
- likely to be necessary for maintaining genetic diversity
- at or near the limit of the species range.

The Sharp-tailed Sandpiper only occurs in Australia during non-breeding seasons, where the distribution of the species spans the entire mainland and surrounding islands. Any population found within the Indicative disturbance footprint would not be associated with breeding or occurring close to ay limit of the species range. The species is more likely to occur in coastal regions along New South Wales, although would occur further inland. Therefore, no important population of Sharp-tailed Sandpiper are likely to occur within the Indicative disturbance footprint.

B4.16.5 Significant impact criteria

An action is likely to have a significant impact on a Vulnerable species if there is a real chance or possibility that it will:

- *lead to a long-term decrease in the size of an important population*

The amended project would not lead to a long-term decrease in the size of an important population, as no important population of the Sharp-tailed Sandpiper has been identified within the Indicative disturbance footprint. The species occurs in Australia only during the non-breeding season and is highly mobile, with individuals using a wide range of habitats across the mainland.

In addition, while there is a potential risk of collision with transmission infrastructure, mitigation measures would be implemented to minimise this risk, including the installation of bird diverters during construction and the early operational phase. On this basis, the amended project is unlikely to result in a long-term decrease in the size of any important population.

- *reduce the area of occupancy of an important population*

The amended project would not reduce the area of occupancy of an important population, as no important population of the Sharp-tailed Sandpiper is considered to occur within the Indicative disturbance footprint. The species has a broad non-breeding distribution across mainland Australia, with an estimated area of occupancy of approximately 13,000 km², extending well beyond the amended project area.

Given the small, localised nature of habitat disturbance relative to the species' overall area of occupancy, the amended project would not reduce the area of occupancy of an important population.

- *fragment an existing important population into two or more populations*

The amended project would not fragment an existing important population into two or more populations, as no important population of the Sharp-tailed Sandpiper occurs within the Indicative disturbance footprint. Furthermore, the species is highly mobile and not reliant on continuous terrestrial habitat for population connectivity.

In addition, mitigation measures would be implemented to reduce collision risk and maintain avian connectivity, including:

- implementation of conductor line-marking techniques to minimise bird strike risk
- installation of bird diverters, with final positioning and model selection to be determined during design refinement and documented in a Connectivity Strategy, with use at minimum within one kilometre of wetland or riverine habitats
- retention of native vegetation within the temporary construction corridor (up to 10 m for 330 kV and 20 m for 500 kV lines), where feasible, to support broader avian connectivity.

The amended project is unlikely to introduce a barrier to movement or result in population fragmentation.

- *adversely affect habitat critical to the survival of a species*

No habitat used by the Sharp-tailed Sandpiper has been identified as habitat critical to the survival of the species. The species is highly flexible in its habitat use compared to other shorebirds and may utilise a range of coastal and inland wetlands, as well as grassy areas, mudflats, mangroves and beaches.

Aquatic habitats most likely to be used by the species would not be directly impacted by the amended project, with impact generally limited to minor trimming or removal of tree canopy along riverbanks. However, where the species habitat occurs within areas of access track upgrades, direct impacts to the waterway may occur but these impacts are generally considered to be minor compared to overall habitat availability within the locality. In addition, mitigation measures, including clearly delineating construction areas and implementing hygiene protocols, would minimise the

potential for indirect impacts to habitat. Therefore, it is unlikely the amended project would adversely impact habitat critical to the survival of the species.

- *disrupt the breeding cycle of an important population*

Sharp-tailed Sandpipers would only be present on the Indicative disturbance footprint during the non-breeding season. As no direct impact would occur from potential clearing for the amended project, the breeding cycle of the Sharp-tailed Sandpiper would not be impacted.

- *modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

Sharp-tailed Sandpiper occupy numerous habitats during the non-breeding season, across both fresh and hypersaline environments. Foraging habitats span mudflats, inland wetlands and sewerage ponds. Roosting occurs in freshwater and inland saltwater habitats. Direct impact to waterbodies or adjacent riparian habitats would be generally limited to the removal or trimming of tree canopy on riverbanks to facilitate the construction and operation of the powerlines spanning riparian areas. Minor in-stream work will be required for access track upgrades but will be temporary and is minor compared to the overall available habitat within the locality. Any potential indirect impacts to these habitats would be managed through mitigation measures. Therefore, the amended project is considered unlikely to result in the modification, removal, isolation, or decreased availability or quality of habitat to the extent that the species is likely to decline.

- *result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat*

Approved conservation advice notes that invasive flora species may pose a threat to the Sharp-tailed Sandpiper where coastal saltmarsh or mangrove habitats are affected. As the Indicative disturbance footprint is located inland and does not contain these habitat types, invasive species are unlikely to represent a significant threat to the species within the amended project area.

Furthermore, the Indicative disturbance footprint is within an already modified landscape where invasive species are present, and standard mitigation measures would be implemented as part of the amended project to prevent the spread or introduction of invasive species. Accordingly, the amended project is unlikely to result in invasive species harmful to the Sharp-tailed Sandpiper becoming established in its habitat.

- *introduce disease that may cause the species to decline*

There are no known diseases causing potential species decline to Sharp-tailed Sandpiper.

- *interfere substantially with the recovery of the species*

Conservation and recovery actions put forth in approved conservation advice for the Sharp-tailed Sandpiper include:

- the identification of important habitat within Australia to reduce habitat loss and maintain functional connectivity during migration
- monitor the spread of Cordgrass and mangroves throughout Australia to control invasive species
- continue survey efforts in inland Australia for migratory shorebird subpopulations and identify important habitats.

Limited direct impact to waterbodies or adjacent riparian habitats would occur due to the removal or trimming of tree canopy on riverbanks to facilitate the construction and operation of the powerlines spanning riparian areas, and minor in-stream works associated with access track upgrades. As such, the amended project is unlikely to substantially interfere with the recovery of the species.

B4.16.6 Conclusion

Based on the assessment above it is unlikely the amended project would result in a significant residual impact on the Sharp-tailed Sandpiper.

B4.17 *Gallinago hardwickii* (Latham's Snipe)

Latham's Snipe is listed as vulnerable under the EPBC Act.

B4.17.1 Description

Latham's Snipe is a non-breeding visitor to south-eastern Australia and is a passage migrant through northern Australia (i.e. it travels through northern Australia to reach non-breeding areas located further south). The species has been recorded along the east coast of Australia from Cape York Peninsula through to south-eastern South Australia (including the Adelaide plains and Mount Lofty Ranges, and the Eyre Peninsula). The range extends inland over the eastern tablelands in south-eastern Queensland (and occasionally from Rockhampton in the north), and to the west of the Great Dividing Range in New South Wales.

Latham's Snipe occurs in permanent and ephemeral wetlands up to 2000 m above sea-level. They usually inhabit open, freshwater wetlands with low, dense vegetation (e.g. swamps, flooded grasslands or heathlands, around bogs and other water bodies), however, they can also occur in habitats with saline or brackish water, in modified or artificial habitats, and in habitats located close to humans or human activity.

Latham's Snipe is an omnivorous species that feeds on seeds and other plant material (mainly from species in families such as *Cyperaceae, Poaceae, Juncaceae, Polygonaceae, Ranunculaceae and Fabaceae*), and on invertebrates including insects (mainly flies and beetles), earthworms and spiders and occasionally molluscs, isopods and centipedes.

B4.17.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

A summary of the relevant Commonwealth guidelines and policy statements available for this species is as follows:

- Conservation advice: "Conservation Advice for *Gallinago hardwickii* (Latham's snipe) (Department of Climate Change, Energy, the Environment and Water (2024). In effect under the EPBC Act from 05-Jan-2024.
- Threat Abatement Plans:
  - "Threat abatement plan for predation by feral cats 2024. {Commonwealth DCCEEW, 2024 #4656}. In effect under the EPBC Act from 24-Dec-2024.
  - "Threat abatement plan for predation by the European red fox. (Department of Climate Change, Energy, the Environment and Water, 2024)" In effect under the EPBC Act from 01-Oct-2008.

Table B.39 identifies the sections of the Revised BDAR where key information relating to the assessment and management of this species is presented.

Table B.39 Reference to relevant sections of the Revised BDAR for *Gallinago hardwickii*

Relevant section of the Revised BDAR
Methodology and survey effort – sections 2.3, 2.6 and 5.4.3
Habitat Information – sections 5.1.1 and 5.2
Impacts – sections 9.1.1, 11.1.1 and Chapter 12
Avoidance and Minimisation Measures – Chapter 8
Figures – Chapter 15

B4.17.3 Specific impacts

Latham's Snipe has been assessed as moderately likely to occur within the Indicative disturbance footprint as the species has been recorded throughout the locality when conditions are favourable. Associated habitat within the Indicative disturbance footprint includes PCTs 7, 10, 11, 13, 15, 17, 20, 28, 44, 86, 160, 163, 164, 216 and 237. A total of 277.2 ha of foraging habitat will be impacted due to the amended project.

B4.17.4 Is this part of an important population?

In accordance with the *Matters of National Environmental Significance – Significant Impact Guidelines 1.1* (Department of the Environment Water Heritage and the Arts 2013), the presence of an important population must be identified prior to addressing the significant impact criteria. An important population is defined in the Significant Impact Guidelines as a population that is necessary for a species' long-term survival and recovery. Under the Act, important populations are:

- likely to be key source populations either for breeding or dispersal
- likely to be necessary for maintaining genetic diversity
- at or near the limit of the species range.

Latham's Snipe is a non-breeding migratory visitor to Australia, occurring widely across eastern and south-eastern Australia during the non-breeding season. Individuals recorded within the Indicative disturbance footprint would form part of a transient, seasonally variable population, rather than a discrete or resident population contributing to breeding or long-term population persistence.

The Indicative disturbance footprint is not located at or near the limit of the species' Australian range, which extends broadly along the east coast and inland across the eastern tablelands and west of the Great Dividing Range. Habitat suitable for Latham's Snipe is widespread across the region and occurs in numerous permanent and ephemeral wetlands, including modified environments.

Given the species' migratory behaviour, broad non-breeding distribution, and reliance on a network of wetlands across the landscape, habitat within the Indicative disturbance footprint is not considered critical for maintaining genetic diversity, nor does it represent a key source population for breeding or dispersal.

Although Latham's Snipe has been assessed as moderately likely to occur within the Indicative disturbance footprint when conditions are favourable, any use of the site would be opportunistic and temporary. On this basis, the Indicative disturbance footprint is not considered to support an important population of Latham's Snipe.

B4.17.5 Significant impact criteria

An action is likely to have a significant impact on a Vulnerable species if there is a real chance or possibility that it will:

- *lead to a long-term decrease in the size of an important population*

The amended project would not lead to a long-term decrease in the size of an important population as no important populations were identified in the Indicative disturbance footprint. Furthermore, the species is not known to breed in Australia, and foraging resources would not be significant impacted. Although there is an increased risk of collision, the amended project would implement mitigation measures to minimise the impacts including:

- conductor line-marking techniques would be implemented during design refinement to minimise bird strike
- bird diverters would be implemented. Positioning and exact diverter model would be finalised during design refinement and would be developed as part of a Connectivity Strategy. At minimum these would be used within one kilometre of wetland/riverine habitats to reduce impacts on aerial fauna species from collision and allow safer passage within these areas.

- *reduce the area of occupancy of an important population*

As no important population is not considered to be present on the Indicative disturbance footprint, the amended project is not likely to reduce the area of occupancy of an important population of the species.

- *fragment an existing important population into two or more populations*

The amended project would not fragment an important population of the species as no important populations were identified in the Indicative disturbance footprint. The species is highly mobile and capable of long-distance flight; therefore the transmission lines may create a barrier to movement for the species. In addition, mitigation measures would be implemented to reduce collision risk and maintain avian connectivity, including:

- conductor line-marking techniques to minimise bird strike
- installation of bird diverters, with final placement and model selection to be determined during design refinement and documented in a Connectivity Strategy, and used at minimum within one kilometre of wetland or riverine habitats
- retention of native vegetation within the temporary construction corridor (up to 10 m for 330 kV and 20 m for 500 kV lines), where feasible.

The amended project is unlikely to introduce a barrier to movement or result in population fragmentation.

- *adversely affect habitat critical to the survival of a species*

The approved conservation advice for the species states that all internationally or nationally important habitat is considered habitat critical to the survival of the species. The Indicative disturbance footprint does not meet the conditions for either of these categories according to the definitions provided. Within Australia, the species usually inhabit open, freshwater wetlands with dense vegetation. Direct impact to waterbodies or adjacent riparian habitats would be generally limited to the removal or trimming of tree canopy on riverbanks to facilitate the construction and operation of the powerlines spanning riparian areas. Minor in-stream work will be required for access track upgrades but will be temporary and is minor compared to the overall available habitat within the locality. Any potential indirect impacts to these habitats would be managed through mitigation measures. Consequently, it is unlikely that the amended project would adversely affect habitat critical to the survival of the species.

- *disrupt the breeding cycle of an important population*

Breeding for the migratory Latham's Snipe does not occur in Australia, being restricted to Japan and Russia. As such, the breeding cycle of the species would not be impacted.

- *modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

Latham's Snipe forage in shallow water and mudflats, while roosting in wetlands with dense cover. Direct impact to waterbodies or adjacent riparian habitats would be generally limited to the removal or trimming of tree canopy on riverbanks to facilitate the construction and operation of the powerlines spanning riparian areas. Minor in-stream work will be required for access track upgrades but will be temporary and is minor compared to the overall available habitat within the locality. Any potential indirect impacts to these habitats would be managed through mitigation measures. Therefore, the amended project is considered unlikely to result in the modification, removal, isolation, or decreased availability or quality of habitat to the extent that the species is likely to decline.

- *result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat*

Both feral cats and foxes are identified as being minor threats to the species within more open habitat ranges. As well as this, grasslands in Cape York are being disrupted by broad-leaved tea-trees, which is not applicable to the Indicative disturbance footprint. Invasive species are already present on the Indicative disturbance footprint from previous disturbances, and the amended project would not lead to a significant increase in such species.

- *introduce disease that may cause the species to decline*

There are no known diseases causing potential species decline to Latham's Snipe. Biosecurity mitigation measures would be put in place to reduce the risk of introduction or spread of disease as a result of project activities.

- *interfere substantially with the recovery of the species*

No recovery plan has been made for Latham's Snipe, however approved conservation advice for the species sets out management priorities including the following:

- identify important habitat for the species to decrease habitat loss caused by residential and commercial development
- development of a habitat model to improve research into the future
- mitigate habitat degradation caused by high-intensity grazing.

The amended project would not significantly affect these management priorities and is therefore unlikely to interfere substantially with the recovery of the species.

B4.17.6 Conclusion

Based on the assessment above and providing mitigation measures are implemented, it is unlikely the amended project would have a significant residual impact on the Latham's Snipe.

B4.18 *Nyctophilus corbeni* (Corben's Long-eared Bat)

Corben's Long-eared Bat is listed as vulnerable under the EPBC Act.

B4.18.1 Description

The distribution of the south eastern form of Corben's Long-eared Bat (*N. corbeni*) coincides approximately with the Murray Darling Basin with the Pilliga Scrub region being the distinct stronghold for this species.

This species inhabits a variety of vegetation types, including mallee, bulloke, *Allocasuarina luehmannii* and box eucalypt dominated communities, but it is distinctly more common in box/ironbark/cypress-pine vegetation that occurs in a north-south belt along the western slopes and plains of NSW and southern Queensland. The species roosts in tree hollows, crevices, and under loose bark. It is a slow flying agile bat, utilising the understorey to hunt non-flying prey, especially caterpillars and beetles, and also hunts on the ground. Mating takes place in autumn with one or two young born in late spring to early summer.

B4.18.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

A summary of the relevant Commonwealth guidelines and policy statements available for this species is as follows:

- Conservation advice: "Conservation Advice *Nyctophilus corbeni* south-eastern long-eared bat (Threatened Species Scientific Committee, 2015). In effect under the EPBC Act from 01-Oct-2015.
- Listing advice: "Commonwealth Listing Advice on ten species of Bats. (Threatened Species Scientific Committee, 2001)" In effect under the EPBC Act from 04-Apr-2001.
- Threat Abatement Plan: "Threat abatement plan for predation by feral cats 2024. {Commonwealth DCCEEW, 2024 #4656}. In effect under the EPBC Act from 24-Dec-2024.

Table B.40 identifies the sections of the Revised BDAR where key information relating to the assessment and management of this species is presented.

Table B.40 Reference to relevant sections of the Revised BDAR for *Nyctophilus corbeni*

Relevant section of the Revised BDAR
Methodology and survey effort – sections 2.3, 2.6 and 5.4.3
Habitat Information – sections 5.1.1 and 5.2
Impacts – sections 9.1.1, 11.1.1 and Chapter 12
Avoidance and Minimisation Measures – Chapter 8
Figures – Chapter 15

B4.18.3 Specific impacts

Corben's Long-eared Bat is associated with numerous plant community types found within the Indicative disturbance footprint, including:

- PCT 10: River Red Gum – Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
- PCT 28: White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
- PCT 86: Yellow Gum tall woodland of the Murray River floodplain, Riverina Bioregion
- PCT 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion.

Associated plant communities of the species cover 38.59 ha of the Indicative disturbance footprint. Threats specific to the amended project include a reduced area of occupancy due to habitat loss particularly in New South Wales, as well as habitat degradation from altered fire regimes and predation by invasive species.

B4.18.4 Is this part of an important population?

In accordance with the *Matters of National Environmental Significance - Significant Impact Guidelines 1.1* (Department of the Environment Water Heritage and the Arts 2013), the presence of an important population must be identified prior to addressing the significance impact criteria. An important population is defined in the Significant Impact Guidelines as a population that is necessary for a species' long-term survival and recovery. Under the Act, important populations are:

- likely to be key source populations either for breeding or dispersal
- likely to be necessary for maintaining genetic diversity
- at or near the limit of the species range.

Approximately 50% of the species distribution occurs in inland NSW with a strong hold in the Piliga scrub region. The Indicative disturbance footprint is outside of the likely distribution of the species according to expert distribution areas (Department of Climate Change, Energy, the Environment and Water, 2026). Furthermore, the extent of associated habitats within the Indicative disturbance footprint is not limiting within the local area, and the species was not identified despite strategy surveys. Therefore, it is unlikely species would represent an important population within the Indicative disturbance footprint.

B4.18.5 Significant impact criteria

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

- *lead to a long-term decrease in the size of an important population*

No important populations of Corben's Long-eared Bat have been identified in the Indicative disturbance footprint. Therefore, it is unlikely the amended project would lead to a long-term decrease in the size of an important population of Corben's Long-eared Bat.

- *reduce the area of occupancy of an important population*

No important populations of Corben's Long-eared Bat have been identified in the Indicative disturbance footprint. Therefore, it is unlikely the amended project would reduce the area of occupancy of an important population of Corben's Long-eared Bat.

- *fragment an existing important population into two or more populations*

It is unlikely the amended project would fragment an existing important population into two or more populations, as no important population was identified. It is noted that the transmission lines may create a barrier to movement for the species. However, mitigation measure would be implemented to reduce risk of collision and to create connectivity in the landscape for bat species. The mitigation measures would be further refined as part of the connectivity strategy and include

- conductor line-marking techniques would be implemented during design refinement to minimise bird strike and impacts to other aerial fauna
- bird diverter models would be implemented. Positioning and exact diverter model would be finalised during design refinement and would be developed as part of a Connectivity Strategy. At minimum these would be used within one kilometre of wetland/riverine habitats to reduce impacts on aerial fauna species from collision and allow safer passage within these areas

- connectivity corridors involving native vegetation retention up to the 10 metre or 20 metre (for 330 kV and 500 kV lines, respectively) wide temporary construction centreline clearing zone would be implemented to better facilitate woodland connectivity. Vegetation heights to be retained would be determined in accordance with vegetation clearing requirements at each location.

Such mitigation measures would alleviate impacts of fragmentation to habitats within and surrounding the Indicative disturbance footprint. Therefore, it is considered unlikely that the amended project would introduce a barrier to movement, which would result in the south-eastern subpopulation being fragmented into two or more populations.

- *adversely affect habitat critical to the survival of a species*

Habitat critical to the survival of Corben's Long-eared Bat has not been formally identified in approved conservation advice. While habitat critical to survival may include areas necessary for foraging, breeding, roosting or dispersal, the Indicative disturbance footprint lies outside the species' likely distribution and does not represent a known stronghold or limiting habitat for the species.

The amended project would result in the loss of approximately 38.59 ha of potential habitat, representing around 0.16% of the 45,584.67 ha of associated habitat within the local area. As impacts are distributed across the broader amended project footprint, the actual loss of habitat relevant to the species is likely to be smaller.

Given the extent of suitable habitat available within the surrounding landscape, the small proportion of habitat affected, and the location of the Indicative disturbance footprint relative to the species' distribution, it is unlikely that the amended project would adversely affect habitat critical to the survival of Corben's Long-eared Bat.

- *disrupt the breeding cycle of an important population*

No important populations of Corben's Long-eared Bat have been identified in the Indicative disturbance footprint; therefore, it is unlikely the amended project would disrupt the breeding cycle of an important population of the species.

- *modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

The amended project would result in the loss of approximately 38.59 ha of potential habitat for Corben's Long-eared Bat, representing a small proportion (approximately 0.16%) of the available associated habitat within the local area. Habitat for the species is not considered limiting at the local or regional scale.

Given the small proportion of habitat affected and the availability of suitable habitat in the surrounding landscape, it is unlikely that the amended project would modify, destroy, remove or isolate habitat to an extent that would result in a decline of the species. In addition, mitigation measures would be implemented to minimise habitat loss and maintain landscape connectivity, including micro-siting of infrastructure and retention of native vegetation within the construction corridor where feasible. These measures would further reduce the likelihood of habitat-related impacts contributing to species decline.

- *result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat*

Habitat for the species in the Indicative disturbance footprint is varied in condition and weed, and pest species are both currently present throughout the landscape. Therefore, with the implementation of biosecurity measures and pest controls it is considered unlikely that the proposal would substantially change the composition of invasive species within the landscape or increase the spread and establishment of invasive species (i.e., predators) that could threaten the survival of the species.

- *introduce disease that may cause the species to decline*

As there are no known diseases likely to impact this species, and given the impacts are well known, it is considered unlikely that the amended project would introduce disease that would cause the decline of the species.

- *interfere substantially with the recovery of the species*

The approved conservation advice for the species sets out a number of conservation actions for the recovery of the species including:

- protect known and potential habitat of key populations, including within conservation reserves, from habitat loss and fragmentation
- provide relevant state government land management agencies, regional bodies and local shires with the location of key populations under their jurisdiction to incorporate these into planning mechanisms to assist in habitat protection
- incorporate findings of research into the impact of forestry practices into forest management to protect key populations
- retain hollow-bearing trees and provide for hollow tree recruitment where possible
- implement control programs of feral species identified as having a known or potential impact on key populations.

The species was not recorded within the Indicative disturbance footprint, and no known or key populations occur within or adjacent to the Indicative disturbance area. While the amended project would result in the loss of approximately 38.59 ha of potential habitat, this represents a small proportion of available habitat at the local scale.

In addition, mitigation measures would be implemented to minimise impacts on hollow-bearing trees and reduce the potential for invasive species impacts. On this basis, the amended project is unlikely to substantially interfere with the recovery of Corben's Long-eared Bat

B4.18.6 Conclusion

Based on the assessment above, it is unlikely the amended project would result in a significant residual impact on Corben's Long-eared Bat.

B4.19 *Phascolarctos cinereus* (Koala)

The Koala is listed as endangered under the EPBC Act

B4.19.1 Description

The range of the Koala differs slightly between the biological species range and listed species range. The biological species range extends from north-eastern Queensland to the south-east corner of South Australia. Several sub-populations of the biological species occur outside of this range in south-eastern South Australia (i.e., Kangaroo Island) and some parts of Victoria, due to translocations. The listed species range extends from north-eastern Queensland to the Victorian border. Distribution of the Koala is influenced by altitude (generally limited to <800 metres above sea level) and tied to temperature. Distribution is also influenced by leaf moisture at the western and northern ends of the range. Koala population density is typically greater towards the coast than inland in these areas (Department of Agriculture Water and the Environment, 2021e).

In NSW, Koala populations are found on the central and north coasts, southern highlands, southern and northern tablelands, Blue Mountains, southern coastal forests and some smaller populations on the plains west of the Great Dividing Range (Department of Planning Industry and Environment, 2021c). Koalas naturally inhabit a range of temperate, sub-tropical and tropical forest, woodland and semi-arid communities dominated by Eucalyptus species. They are a leaf-eating specialist that feed primarily during dawn, dusk or night.

Koalas feed primarily on the foliage of Eucalyptus species; though may sometimes consume *Corymbia spp*., *Angophora spp*. and *Lophostemon spp*. and occasionally *Leptospermum spp*. and *Melaleuca spp*. Individual Koalas typically get their nutrition from just one or a few species present at a site (Department of Agriculture Water and the Environment, 2021e). Koalas typically give birth between October and May and can potentially produce one offspring each year. Young remain in the pouch for 6–8 months and remain with their mothers until they become independent at approximately 12 months of age (Department of Agriculture Water and the Environment, 2021e).

B4.19.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

A summary of the relevant Commonwealth guidelines and policy statements available for this species is as follows:

- Conservation advice: “Conservation Advice for *Phascolarctos cinereus* (combined populations in Queensland, New South Wales and the Australian Capital Territory)” (Department of Agriculture Water and the Environment, 2022).
- Adopted/made recovery plan: “National Recovery Plan for the Koala *Phascolarctos cinereus* (combined populations of Queensland, New South Wales and the Australian Capital Territory)” (Department of Agriculture, 2022).
- Threat Abatement Plan: “Threat abatement plan for predation by feral cats 2024”. {Commonwealth DCCEEW, 2024 #4656}. In effect under the EPBC Act from 24-Dec-2024.

Additional resources reviewed:

- Policy Statements and Guidelines: Identifying habitat for the endangered Koala (Department of Climate Change, Energy, the Environment and Water, 2022); Referral guidance for the endangered Koala (Department of Climate Change, Energy, the Environment and Water, 2023).

Table B.41 identifies the sections of the Revised BDAR where key information relating to the assessment and management of this species is presented.

Table B.41 Reference to relevant sections of the Revised BDAR for *Phascolarctos cinereus*

Relevant section of the Revised BDAR
Methodology and survey effort – sections 2.3, 2.6 and 5.4.2
Habitat Information – sections 5.1.2, 5.2, 5.3 and 5.3.13
Impacts – sections 9.1.5, 11.1.2 and Chapter 12
Avoidance and Minimisation Measures – Chapter 8
Figures – Chapter 15

B4.19.3 Specific impacts

The Koala was not recorded during the targeted surveys; however presence has been assumed within areas of habitat which did not receive adequate targeted survey. This includes 138.41 ha across PCTs 7, 10, 11, 13, 15, 17, 20, 23, 24, 26, 28, 53, 58, 86, 157, 159, 160, 170, 216, 237, 266, 277, 319, 343 & 346.

B4.19.4 Significant impact criteria

An action is likely to have a significant impact on an endangered species if there is a real chance or possibility that it will:

- *lead to a long-term decrease in the size of a population*

The Koala's distribution includes Queensland, New South Wales, the Australian Capital Territory, Victoria, and South Australia. The Koala's distribution is not continuous across this range, and it occurs in several subpopulations that are separated by cleared land or unsuitable habitat. In NSW, koala populations are found on the central and north coasts, southern highlands, southern and northern tablelands, Blue Mountains, southern coastal forests, with some smaller populations on the plains west of the Great Dividing Range. Estimated populations in the NSW southwestern slopes was 2,310 individuals in 2012, and in Cobar Peneplain and Riverina was 2,354.

The Koala was not recorded during targeted surveys; however, presence has been assumed within 138.41 ha of potential habitat associated with PCTs 7, 10, 11, 13, 15, 17, 20, 23, 24, 26, 28, 53, 58, 86, 157, 159, 160, 170, 216, 237, 266, 277, 319, 343 & 346. The mapped extent of these PCTs within the local area (10 km buffer) is approximately 58,802.02 ha, with the assumed habitat loss representing approximately 0.24 % of the available habitat within the locality.

Given the small proportion of habitat affected relative to its availability in the surrounding landscape, the amended project is unlikely to reduce habitat resources at a scale that would result in a long-term decline in the size of a koala population, if present.

In addition, mitigation measures would be implemented to minimise impacts, including micro-siting of transmission towers and spanning of vegetation where practicable. These measures would further reduce habitat loss and avoid the creation of barriers to movement. On this basis, the amended project is unlikely to lead to a long-term decrease in the size of a Koala population.

— *reduce the area of occupancy of the species*

The listed population of the Koala has a wide but patchy distribution that spans the coastal and inland areas of Queensland north to the Herberton area, extending westwards into hotter and dryer semi-arid climates of central Queensland, New South Wales, and the Australian Capital Territory.

The area of occupancy for Koala is estimated at 19,400 square kilometres (1,940,000 ha), based on the mapping of point records from 2000 from state governments, museums, and CSIRO. The amended project would result in the loss of 138.41 ha of assumed habitat, representing 0.007% of the species area of occupancy. Considering this is likely an overestimate of occupied habitat, this figure would likely be much lower and would not be considered a significant reduction in area of occupancy for the species.

— *fragment an existing population into two or more populations*

Koalas utilise agricultural land and are known to cross fences and cleared paddocks (see Kavanagh & Stanton, 2012), and use of scattered trees in paddocks is also documented (see Barth et al., 2019). Given the nature of the amended project (towers would be micro-sited, riparian areas would be avoided and transmission lines would span large area of vegetation), the current level of landscape permeability for Koala would not likely be impacted. The powerline corridor would be highly permeable and would not provide a barrier to Koala movement. There is a limited likelihood therefore that the amended project would fragment an existing population into two or more populations.

— *adversely affect habitat critical to the survival of a species*

The approved conservation advice the species outlines several important criteria to consider in terms of 'habitat critical for survival' of Koala including:

- whether the habitat is used during periods of stress (examples: flood, drought, or fire)
- whether the habitat is used to meet essential life cycle requirements (examples: foraging, breeding, nesting, roosting, social behaviour patterns or seed dispersal processes)
- the extent to which the habitat is used by important populations
- whether the habitat is necessary to maintain genetic diversity and long-term evolutionary development
- whether the habitat is necessary for use as corridors to allow the species to move freely between sites used to meet essential life cycle requirements
- whether the habitat is necessary to ensure the long-term future of the species or ecological community through reintroduction or re-colonisation.

The Koala was not recorded within the amended project area, and habitat within the Indicative disturbance footprint is not considered limiting at the local or regional scale. Given the availability of suitable habitat in the surrounding landscape and the absence of known important habitat features within the Indicative disturbance footprint, it is unlikely that habitat within the amended project area represents habitat critical to the survival of the species. The amended project is unlikely to adversely affect habitat critical to the survival of the Koala.

— *disrupt the breeding cycle of a population*

The amended project would result in the loss of approximately 138.41 ha of assumed koala habitat. However, this represents a small proportion of available habitat within the local area, and the species was not recorded during targeted surveys. Given the limited extent of habitat loss, the availability of suitable habitat in the surrounding landscape, and the amended project design (including micro-siting of towers, avoidance of riparian areas and spanning of vegetation), the amended project is unlikely to disrupt the breeding cycle of the species.

- *modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

The assumed Koala habitat within the Indicative disturbance footprint (138.41 ha) represents approximately 0.24 % of the mapped extent of this habitat within the local area. Given the small proportion of habitat affected, the mobility of the species, and the absence of recorded individuals within the Indicative disturbance footprint, it is unlikely that the amended project would modify, remove, isolate or reduce the availability or quality of habitat to an extent that would result in a decline of the species.

- *result in invasive species that are harmful to an endangered species becoming established in the endangered species' habitat*

The amended project is unlikely to result in invasive species harmful to the Koala becoming established within the Indicative disturbance footprint. While ground disturbance associated with construction has the potential to facilitate weed spread, the Indicative disturbance footprint occurs within an already modified landscape where invasive species are present.

Standard construction controls would be implemented to minimise the risk of introducing or spreading invasive species, including limiting disturbance to the approved footprint, managing vehicle and machinery hygiene, and stabilising disturbed areas to reduce opportunities for weed establishment. These measures reduce the likelihood of a measurable increase in invasive species that would affect Koala habitat quality.

Accordingly, there is no real chance or possibility that the amended project would result in invasive species harmful to the Koala becoming established in the habitat.

- *introduce disease that may cause the species to decline*

Chlamydia bacteria in Koalas and Koala Retrovirus are primarily transmitted between Koala individuals (Department of Environment & Climate Change, 2008). It is likely that the disease is already present within the landscape. The amended project would implement best practice hygiene protocols as part of the construction environmental management plan to prevent the introduction or spread of pathogens. Therefore, the amended project is unlikely to further introduce disease that may cause the species to decline.

- *interfere substantially with the recovery of the species*

The recovery plan for the species outlines a number of key objectives for the recovery effort of the species including:

- the area of occupancy and estimated size of populations that are declining, suspected to be declining, or predicted to decline are instead stabilised then increased
- the area of occupancy and estimated size of populations that are suspected and predicted to be stable are maintained or increased
- metapopulation processes are maintained or improved
- partners, communities, and individuals have a greater role and capability in listed Koala monitoring, conservation, and management.

The objectives of this recovery plan are underpinned by four supporting strategies and two on-ground (direct) strategies, or action areas, as a way of organising and implementing coordinated action:

- build and share knowledge (Strategy 1)
- engage and partner with the community in listed Koala conservation (Strategy 2)
- increase the area of protected habitat for the listed Koala (Strategy 3)
- integrate listed Koala conservation into policy, statutory and land use plans (Strategy 4)
- strategically restore listed Koala habitat (Strategy 5)
- actively manage listed Koala metapopulations (Strategy 6).

The amended project would result in the loss of 138.41 ha of assumed Koala habitat, representing a small proportion of habitat available within the local area. The Koala was not recorded during targeted surveys, and the amended project would not affect known key populations or core habitat areas.

Given the limited extent of habitat loss and the availability of suitable habitat within the surrounding landscape, the amended project is unlikely to substantially interfere with the recovery objectives or strategies for the Koala.

B4.19.5 Conclusion

Based on the assessment against the EPBC Act significant impact criteria and having regard to the scale and nature of impacts, the availability of habitat within the surrounding landscape, and the absence of recorded individuals, it is unlikely that the loss of 138.41 ha of assumed habitat would result in a significant residual impact on the Koala.

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Appendix D

Vegetation survey data

D1 Murray Fans IBRA

D1.1 PCT 7 – River Red Gum – Warrego Grass – herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion (Moderate_good)

VNI_DR20

Date	30/04/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54	Easting	758712
Plot Name	VNI_DR20		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count		Northing	6092367
PCT	7		10	10	1	0	2	7	0	0	0	0		Orientation	275
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum		Plot size	20 X 20 X 50
Species	Cover	Abundance	37.7	37.7	10	0	10.2	17.5	0	0	0	0		Attributes 20x50m plot	
Eucalyptus camaldulensis	10	25	TG		10									Stem classes	
Paspalidium jubiflorum	10	100	GG				10							80+	2
Centipeda cunninghamii	15	200	FG					15						50-79	1
Senecio sp.	0.1	10	FG					0.1						30-49	7
Cynodon dactylon	0.2	20	GG				0.2							20-29	Yes
Wahlenbergia communis	0.1	5	FG					0.1						10-19	Yes
Chrysocephalum apiculatum	0.1	5	FG					0.1						5-9	Yes
Alternanthera denticulata	2	100	FG					2						<5	Yes
Euphorbia dallachyana	0.1	5	FG					0.1						Hollows	3
Centipeda crateriformis subsp. crateriformis	0.1	5	FG					0.1						Length logs (m)	62
														Attributes 1x1 plot (%)	
														Litter (%)	21

VNI_DR46

Date	6/05/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54	Easting	764032
Plot Name	VNI_DR46		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count		Northing	6117315
PCT	7		7	7	1	0	1	5	0	0	0	0		Orientation	270
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum		Plot size	20 X 20 X 50
Species	Cover	Abundance	26.9	26.9	10	0	15	1.9	0	0	0	0		Attributes 20x50m plot	
Eucalyptus camaldulensis	10	6	TG		10									Stem classes	
Paspalidium jubiflorum	15	200	GG				15							80+	6
Alternanthera denticulata	1	200	FG					1						50-79	0
Centipeda cunninghamii	0.5	30	FG					0.5						30-49	1
Centipeda crateriformis subsp. compacta	0.2	10	FG					0.2						20-29	yes
Dysphania pumilio	0.1	5	FG					0.1						10-19	yes
Rumex brownii	0.1	5	FG					0.1						5-9	yes
														<5	yes
														Hollows	6
														Length logs (m)	12
														Attributes 1x1 plot (%)	
														Litter (%)	45

VNI_DR93

Date	21/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54	Easting	758983
Plot Name	VNI_DR93		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count		Northing	6092240
PCT	7		23	17	1	0	2	14	0	0	6	0		Orientation	260
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum		Plot size	20 X 20 X 50
Species	Cover	Abundance	39.2	38.5	10	0	15.2	13.3	0	0	0.7	0		Attributes 20x50m plot	
Eucalyptus camaldulensis	10	7	TG		10									Stem classes	
Paspalidium jubiflorum	15	200	GG				15							80+	1
Centipeda minima	5	800	FG					5						50-79	0
Wahlenbergia fluminalis	0.2	200	FG					0.2						30-49	3
Senecio quadridentatus	0.1	30	FG					0.1						20-29	Yes
Alternanthera denticulata	5	200	FG					5						10-19	Yes
Pseudognaphalium luteoalbum	1	50	FG					1						5-9	Yes
*Sonchus oleraceus**	0.1	20	EX								0.1			<5	Yes
Einadia nutans subsp. nutans	0.4	20	FG					0.4						Hollows	1
*Solanum nigrum**	0.2	5	EX								0.2			Length logs (m)	62
*Cirsium vulgare**	0.1	1	EX								0.1				
Vittadinia gracilis	0.5	30	FG					0.5						Attributes 1x1 plot (%)	
Centipeda crateriformis	0.5	30	FG					0.5						Litter (%)	38
Euphorbia drummondii	0.1	10	FG					0.1							
*Fumaria capreolata**	0.1	10	EX								0.1				
*Lolium perenne**	0.1	20	EX								0.1				
Vittadinia cuneata var. hirsuta	0.1	5	FG					0.1							
Juncus flavidus	0.2	20	GG				0.2								
Daucus glochidiatus	0.1	5	FG					0.1							
*Lepidium africanum**	0.1	5	EX								0.1				
Rhodanthe corymbiflora	0.1	5	FG					0.1							
Brachyscome ciliaris	0.1	5	FG					0.1							
Einadia nutans subsp. linifolia	0.1	10	FG					0.1							

VNI_NM033

Date	16/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_NM033		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	7		21	18	2	0	9	7	0	0	3	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	41.8	41.5	21	0	19.8	0.7	0	0	0.3	0	
Eucalyptus camaldulensis	20	30	TG		20								
Eucalyptus microcarpa	1	1	TG		1								
Paspalidium jubiflorum	5	50	GG				5						
Cynodon dactylon	5	50	GG				5						
Alternanthera denticulata	0.1	20	FG					0.1					
Juncus aridicola	2	50	GG				2						
Juncus flavidus	0.5	50	GG				0.5						
*Sonchus oleraceus**	0.1	10	EX								0.1		
Eleocharis acuta	2	50	GG				2						
*Lolium perenne**	0.1	20	EX								0.1		
Juncus holoschoenus	0.1	20	GG				0.1						
Centipeda cunninghamii	0.1	20	FG					0.1					
Cyperus exaltatus	0.1	20	GG				0.1						
Paspalum distichum	5	50	GG				5						
Lachnagrostis filiformis	0.1	20	GG				0.1						
Wahlenbergia fluminalis	0.1	10	FG					0.1					
Pseudognaphalium luteoalbum	0.1	20	FG					0.1					
Eclipta platyglossa	0.1	20	FG					0.1					
Senecio quadridentatus	0.1	10	FG					0.1					
Cirsium vulgare	0.1	10	EX								0.1		
Euphorbia dallachyana	0.1	10	FG					0.1					

Easting	760709
Northing	6083631
Orientation	110
Plot size	20 X 20 X 50
AM Attributes 20x50m plot	
Stem classes	
80+	1
50-79	2
30-49	9
20-29	Yes
10-19	Yes
5-9	No
<5	Yes
Hollows	3
Length logs (m)	111
AM Attributes 1x1 plot (%)	
Litter (%)	62

VNI_NM037

Date	16/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_NM037		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	7		27	20	2	1	5	12	0	0	7	2	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	31.2	29.6	21	1	1.4	6.2	0	0	1.6	0.2	
Eucalyptus largiflorens	1	1	TG		1								
Eucalyptus camaldulensis	20	50	TG		20								
Haloragis aspera	0.2	50	FG					0.2					
Vittadinia gracilis	5	200	FG					5					
Cynodon dactylon	1	50	GG				1						
*Sonchus oleraceus**	0.1	50	EX								0.1		
*Lolium rigidum**	1	500	EX								1		
*Hypochaeris glabra**	0.1	50	EX								0.1		
Wahlenbergia spp.	0.1	50	FG					0.1					
*Vulpia bromoides**	0.1	100	EX								0.1		
Euphorbia drummondii	0.1	20	FG					0.1					
Senecio quadridentatus	0.1	20	FG					0.1					
Cotula australis	0.1	10	FG					0.1					
Pseudognaphalium luteoalbum	0.1	20	FG					0.1					
Eclipta platyglossa	0.1	10	FG					0.1					
Centipeda minima	0.1	20	FG					0.1					
Cyperus spp.	0.1	20	GG				0.1						
Rytidosperma setaceum	0.1	20	GG				0.1						
Paspalidium jubiflorum	0.1	10	GG				0.1						
Duma florulenta	1	20	SG			1							
Eclipta platyglossa	0.1	20	FG					0.1					
Alternanthera denticulata	0.1	10	FG					0.1					
*Xanthium spinosum**	0.1	10	HT									0.1	
Rhodanthe corymbiflora	0.1	50	FG					0.1					
Eleocharis acuta	0.1	20	GG				0.1						
*Phyla canescens**	0.1	20	HT									0.1	
*Cirsium vulgare**	0.1	10	EX								0.1		

Easting	760871
Northing	6083477
Orientation	300
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	1
50-79	2
30-49	5
20-29	Yes
10-19	Yes
5-9	Yes
<5	Yes
Hollows	1
Length logs (m)	118
Attributes 1x1 plot (%)	
Litter (%)	58

D1.2 PCT 10 – River Red Gum – Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (Derived_No offset)

VNI_DR123

Date	14/04/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54	Easting	763068
Plot Name	VNI_DR123		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count		Northing	6112617
PCT	10		15	13	0	8	1	4	0	0	2	0		Orientation	230
Condition	Derived_No offset		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum		Plot size	20 X 20 X 50
Species	Cover	Abundance	13.3	12.8	0	11.3	0.1	1.4	0	0	0.5	0		Attributes 20x50m plot	
Sclerolaena muricata var. semiglabra	2	30	SG			2								Stem classes	
Maireana brevifolia	5	30	SG			5								80+	0
*Heliotropium europaeum**	0.4	50	EX								0.4			50-79	0
Oxalis perennans	0.1	10	FG					0.1						30-49	0
Erodium crinitum	0.1	5	FG					0.1						20-29	No
Boerhavia coccinea	0.2	30	FG					0.2						10-19	No
Atriplex eardleyae	1	60	SG			1								5-9	No
Salsola australis	0.1	5	SG			0.1								<5	No
Rytidosperma spp.	0.1	5	GG				0.1							Hollows	0
Rhagodia spinescens	2	5	SG			2								Length logs (m)	0
*Echium plantagineum**	0.1	10	EX								0.1				
Atriplex lindleyi	1	20	FG					1						Attributes 1x1 plot (%)	
Atriplex leptocarpa	0.1	20	SG			0.1								Litter (%)	14
Nitraria billardierei	1	2	SG			1									
Sclerolaena brachyptera	0.1	5	SG			0.1									

VNI_MP50

Date	20/02/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54	Easting	760514
Plot Name	VNI_MP50		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count		Northing	6071891
PCT	10		20	11	0	1	5	5	0	0	9	3		Orientation	205
Condition	Derived_No offset		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum		Plot size	20 X 50
Species	Cover	Abundance	20.1	11.7	0	0.1	6.2	5.4	0	0	8.4	3.6		Attributes 20x50m plot	
Austrostipa scabra subsp. falcata	1	30	GG				1							Stem classes	
Rytidosperma caespitosum	2	50	GG				2							80+	0
Solanum esuriale	5	500	FG					5						50-79	0
Sclerolaena muricata	0.1	5	SG			0.1								30-49	0
*Xanthium spinosum**	0.5	10	HT									0.5		20-29	No
*Heliotropium europaeum**	0.5	30	EX								0.5			10-19	No
*Lolium spp.**	3	100	EX								3			5-9	No
*Carthamus lanatus**	3	100	HT									3		<5	No
*myriocarpus**	1	10	EX								1			Hollows	0
*Bromus diandrus**	0.1	5	HT									0.1		Length logs (m)	0
Cressa australis	0.1	2	FG					0.1							
Vittadinia cuneata	0.1	1	FG					0.1						Attributes 1x1 plot (%)	
*Cirsium vulgare**	0.1	5	EX								0.1			Litter (%)	2.6
Dysphania pumilio	0.1	10	FG					0.1							
*Echium plantagineum**	0.1	20	EX								0.1				
*Sonchus asper**	0.1	5	EX								0.1				
Wahlenbergia spp.	0.1	3	FG					0.1							
Enteropogon acicularis	0.1	10	GG				0.1								
Walwhalleya proluta	0.1	2	GG				0.1								
Rytidosperma setaceum	3	150	GG				3								

VNI_MP51

Date	20/02/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54	Easting	760457
Plot Name	VNI_MP51		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count		Northing	6071583
PCT	10		16	9	0	1	4	4	0	0	7	1		Orientation	102
Condition	Derived_No offset		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum		Plot size	20 X 50
Species	Cover	Abundance	11.1	8.1	0	0.1	7.2	0.8	0	0	3	2		Attributes 20x50m plot	
Austrostipa scabra subsp. falcata	0.1	10	GG				0.1							Stem classes	
Sclerolaena muricata	0.1	10	SG			0.1								80+	0
Solanum esuriale	0.5	20	FG					0.5						50-79	0
*Chenopodium album**	0.1	2	EX								0.1			30-49	0
*Heliotropium europaeum**	0.5	25	EX								0.5			20-29	No
*Lolium spp.**	0.1	20	EX								0.1			10-19	No
*Carthamus lanatus**	2	200	HT									2		5-9	No
*myriocarpus**	0.1	3	EX								0.1			<5	No
Cressa australis	0.1	20	FG					0.1						Hollows	0
*Cirsium vulgare**	0.1	1	EX								0.1			Length logs (m)	0
Dysphania pumilio	0.1	5	FG					0.1							
*Sonchus asper**	0.1	10	EX								0.1			Attributes 1x1 plot (%)	
Wahlenbergia spp.	0.1	1	FG					0.1						Litter (%)	1
Enteropogon acicularis	2	20	GG				2								
Walwhalleya proluta	0.1	10	GG				0.1								
Rytidosperma setaceum	5	500	GG				5								

VNI_NM040

Date	17/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_NM040		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	10		21	13	1	5	2	5	0	0	8	0	
Condition	Derived_No offset		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	86.8	23.2	1	11.2	10.1	0.9	0	0	63.6	0	
Eucalyptus largiflorens	1	1	TG		1								
*Bromus rubens**	1	50	EX								1		
*Hordeum leporinum**	50	2000	EX								50		
Sclerolaena muricata	5	30	SG			5							
*Medicago praecox**	5	500	EX								5		
Maireana brevifolia	1	30	SG			1							
Rytidosperma setaceum	10	100	GG				10						
*Vulpia bromoides**	5	500	EX								5		
Solanum esuriale	0.1	20	FG					0.1					
Austrostipa scabra	0.1	20	GG				0.1						
Crassula colorata	0.1	100	FG					0.1					
*Marrubium vulgare**	1	20	EX								1		
Rhagodia spinescens	5	30	SG			5							
*Cotula bipinnata**	0.5	100	EX								0.5		
Rhodanthe corymbiflora	0.1	50	FG					0.1					
Einadia nutans	0.5	100	FG					0.5					
*Sisymbrium irio**	0.1	10	EX								0.1		
*Lolium rigidum**	1	100	EX								1		
Sida corrugata	0.1	20	FG					0.1					
Chenopodium nitrariaceum	0.1	1	SG			0.1							
Atriplex leptocarpa	0.1	10	SG			0.1							

Easting	763090
Northing	6111936
Orientation	215
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	Yes
<5	No
Hollows	0
Length logs (m)	53
Attributes 1x1 plot (%)	
Litter (%)	4

VNI_NM041

Date	17/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_NM041		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	10		16	10	0	4	3	3	0	0	6	0	
Condition	Derived_No offset		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	83.1	21.8	0	20.3	1.2	0.3	0	0	61.3	0	
Nitraria billardierei	0.1	1	SG			0.1							
Sclerolaena muricata	20	200	SG			20							
*Hordeum leporinum**	50	3000	EX								50		
*Medicago praecox**	10	500	EX								10		
Rhodanthe corymbiflora	0.1	200	FG					0.1					
Solanum esuriale	0.1	50	FG					0.1					
Rytidosperma setaceum	1	200	GG				1						
*Cotula bipinnata**	0.1	200	EX								0.1		
Oxalis perennans	0.1	20	FG					0.1					
Enteropogon acicularis	0.1	10	GG				0.1						
*Lolium rigidum**	1	100	EX								1		
Rytidosperma caespitosum	0.1	10	GG				0.1						
Maireana brevifolia	0.1	10	SG			0.1							
*Erodium cicutarium**	0.1	10	EX								0.1		
Rhagodia spinescens	0.1	10	SG			0.1							
*Schismus barbatus**	0.1	10	EX								0.1		

Easting	763251
Northing	6111686
Orientation	43
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

D1.3 PCT 10 – River Red Gum – Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (Thinned)

VNI_DR18

Date	17/04/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_DR18		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	10		7	7	2	2	1	1	1	0	0	0	
Condition	Thinned		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	26.1	26.1	20	5.8	0.1	0.1	0.1	0	0	0	
Eucalyptus camaldulensis	10	4	TG		10								
Eucalyptus largiflorens	10	8	TG		10								
Duma florulenta	5	50	SG			5							
Marsilea drummondii	0.1	2	EG						0.1				
Euphorbia drummondii	0.1	10	FG					0.1					
Chenopodium nitrariaceum	0.8	1	SG			0.8							
Paspalidium jubiflorum	0.1	1	GG				0.1						

Easting	758302
Northing	6087834
Orientation	250
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	1
50-79	2
30-49	4
20-29	Yes
10-19	Yes
5-9	No
<5	Yes
Hollows	0
Length logs (m)	85
Attributes 1x1 plot (%)	
Litter (%)	32

VNI_MP07

Date	9/09/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_MP07		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	10		14	10	1	5	0	4	0	0	4	0	
Condition	Thinned		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	94.4	7.4	1	5.1	0	1.3	0	0	87	0	
Eucalyptus camaldulensis	1	1	TG		1								
*Hordeum leporinum**	35	250	EX								35		
*Malva parviflora**	1	10	EX								1		
*Lolium rigidum**	50	500	EX								50		
*Sisymbrium irio**	1	25	EX								1		
Mariana brevifolia	1	50	SG			1							
Sclerolaena tricuspis	1	5	SG			1							
Duma flurolenta	1	1	SG			1							
Sclerolaena stelligera	2	25	SG			2							
Atriplex leptocarpa	0.1	1	SG			0.1							
Vittadinia cuneata	0.1	1	FG					0.1					
Mariana ciliata	0.1	1	FG					0.1					
Eucalyptus largiflorens	1	1	FG					1					
Cressa australis	0.1	1	FG					0.1					

Easting	758942
Northing	6092344
Orientation	104
Plot size	20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	Yes
5-9	No
<5	No
Hollows	0
Length logs (m)	2
Attributes 1x1 plot (%)	
Litter (%)	1.22

VNI_MP33

Date	14/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_MP33		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	10		10	8	2	2	1	3	0	0	2	1	
Condition	Thinned		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	22.8	22.6	22	0.2	0.1	0.3	0	0	0.2	0.1	
Eucalyptus camaldulensis	2	1	TG		2								
Eucalyptus largiflorens	20	8	TG		20								
Ludwigia peploides	0.1	15	FG					0.1					
*Xanthium spinosum**	0.1	5	HT									0.1	
Duma florulenta	0.1	5	SG			0.1							
Juncus spp.	0.1	5	GG				0.1						
Pseudognaphalium luteoalbum	0.1	25	FG					0.1					
Sida corrugata	0.1	5	FG					0.1					
Atriplex leptocarpa	0.1	1	SG			0.1							
*Hordeum leporinum**	0.1	1	EX								0.1		

Easting	759014
Northing	6095336
Orientation	90
Plot size	10 X 100
Attributes 20x50m plot	
Stem classes	
80+	2
50-79	5
30-49	4
20-29	Yes
10-19	No
5-9	No
<5	Yes
Hollows	6
Length logs (m)	56
Attributes 1x1 plot (%)	
Litter (%)	10

VNI_MP41

Date	16/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_MP41		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	10		22	14	2	5	2	5	0	0	8	1	
Condition	Thinned		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	30.4	18.4	2	14	1.1	1.3	0	0	12	0.1	
Eucalyptus camaldulensis	1	1	TG		1								
Eucalyptus largiflorens	1	1	TG		1								
Duma florulenta	2	5	SG			2							
Chenopodium nitrariaceum	0.5	5	SG			0.5							
*Lolium rigidum**	10	100	EX								10		
Goodenia pinnatifida	0.1	25	FG					0.1					
Atriplex semibaccata	10	30	SG			10							
Sclerolaena muricata	0.5	10	SG			0.5							
Vittadinia cuneata	0.5	50	FG					0.5					
*Lactuca serriola**	0.1	25	EX								0.1		
*Sonchus oleraceus**	0.5	30	EX								0.5		
Einadia nutans	0.5	20	FG					0.5					
*Hordeum leporinum**	1	50	EX								1		
Maireana brevifolia	1	25	SG			1							
*Marrubium vulgare**	0.1	5	EX								0.1		
*Avena fatua**	0.1	20	EX								0.1		
*Xanthium spinosum**	0.1	1	HT									0.1	
Walwhalleya proluta	0.1	10	GG				0.1						
*Medicago praecox**	0.1	20	EX								0.1		
Euphorbia drummondii	0.1	5	FG					0.1					
Alternanthera spp.	0.1	10	FG					0.1					
Rytidosperma setaceum	1	50	GG				1						

Easting	760814
Northing	6083430
Orientation	290
Plot size	20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	Yes
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	38

VNI_MP42

Date	16/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_MP42		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	10		17	13	1	3	2	7	0	0	4	0	
Condition	Thinned		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	37	35.7	15	2.1	17	1.6	0	0	1.3	0	
Eucalyptus camaldulensis	15	12	TG		15								
Duma florulenta	1	2	SG			1							
Rhagodia spinescens	0.1	1	SG			0.1							
Rytidosperma setaceum	15	250	GG				15						
*Lepidium africanum**	0.1	1	EX								0.1		
Euphorbia drummondii	1	25	FG					1					
Atriplex semibaccata	1	15	SG			1							
*Lolium rigidum**	1	50	EX								1		
Enteropogon acicularis	2	20	GG				2						
Vittadinia cuneata	0.1	5	FG					0.1					
*Sonchus asper**	0.1	5	EX								0.1		
Trianthema spp.	0.1	5	FG					0.1					
Sida corrugata	0.1	10	FG					0.1					
*Sonchus oleraceus**	0.1	5	EX								0.1		
Goodenia spp.	0.1	5	FG					0.1					
Einadia nutans	0.1	10	FG					0.1					
Oxalis perennans	0.1	5	FG					0.1					

Easting	760969
Northing	6083215
Orientation	220
Plot size	20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	1
20-29	Yes
10-19	Yes
5-9	Yes
<5	Yes
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	30

VNI_MP52

Date	20/02/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_MP52		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	10		16	7	1	2	2	2	0	0	9	1	
Condition	Thinned		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	40.4	39.1	2	35.1	1	1	0	0	1.3	0.1	
Eucalyptus camaldulensis	2	15	TG		2								
Solanum esuriale	0.5	100	FG					0.5					
Sclerolaena muricata	35	100	SG			35							
Austrostipa scabra	0.5	50	GG				0.5						
Rytidosperma setaceum	0.5	25	GG				0.5						
*Cirsium vulgare**	0.1	3	EX								0.1		
Dysphania pumilio	0.5	10	FG					0.5					
*Cucumis myriocarpus subsp myriocarpus**	0.1	5	EX								0.1		
*Marrubium vulgare**	0.1	2	EX								0.1		
*Hordeum leporinum**	0.5	50	EX								0.5		
Enchylaena tomentosa	0.1	2	SG			0.1							
*Chenopodium album**	0.1	30	EX								0.1		
*Xanthium spinosum**	0.1	5	HT									0.1	
*Lolium spp.**	0.1	20	EX								0.1		
*Heliotropium europaeum**	0.1	5	EX								0.1		
*Conyza bonariensis**	0.1	1	EX								0.1		

Easting	760153
Northing	6070248
Orientation	0
Plot size	20 X 50
Attributes 20x50m plot	
Stem classes	
80+	2
50-79	2
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	2
Length logs (m)	6
Attributes 1x1 plot (%)	
Litter (%)	26.4

VNI_NM032

Date	15/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_NM032		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	10		13	9	2	5	0	2	0	0	4	1	
Condition	Thinned		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	53.9	51.3	30	16.2	0	5.1	0	0	2.6	1	
Eucalyptus camaldulensis	20	10	TG		20								
Eucalyptus largiflorens	10	10	TG		10								
*Lycium ferocissimum**	1	1	HT									1	
Einadia nutans	5	20	FG					5					
Rhagodia spinescens	10	50	SG			10							
*Medicago praecox**	1	100	EX								1		
Atriplex semibaccata	5	50	SG			5							
Sclerolaena muricata	1	30	SG			1							
*Sisymbrium irio**	0.1	50	EX								0.1		
Chenopodium nitrariaceum	0.1	10	SG			0.1							
Sida corrugata	0.1	10	FG					0.1					
Enchylaena tomentosa	0.1	10	SG			0.1							
*Marrubium vulgare**	0.5	10	EX								0.5		

Easting	762598
Northing	6112524
Orientation	163
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	2
50-79	1
30-49	6
20-29	No
10-19	No
5-9	No
<5	No
Hollows	5
Length logs (m)	76
BAM Attributes 1x1 plot (%)	
Litter (%)	56

D1.4 PCT 11 – River Red Gum – Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (Moderate_good)

VNI_DR80

Date	17/09/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_DR80		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	11		37	28	1	6	5	15	1	0	9	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	47.7	46.2	5	36.4	1.5	3.2	0.1	0	1.5	0	
Eucalyptus camaldulensis	5	3	TG		5								
Duma florulenta	25	100	SG			25							
Rhodanthe corymbiflora	0.1	20	FG					0.1					
Chenopodium nitrariaceum	10	20	SG			10							
Paspalidium jubiflorum	0.2	20	GG				0.2						
Centipeda minima	0.5	30	FG					0.5					
*Medicago praecox**	0.2	100	EX								0.2		
Oxalis perennans	0.3	100	FG					0.3					
*Sonchus oleraceus**	0.2	20	EX								0.2		
Alternanthera nana	0.1	10	FG					0.1					
*Lolium rigidum**	0.1	10	EX								0.1		
Einadia nutans	1	30	FG					1					
Wahlenbergia communis	0.1	20	FG					0.1					
*Hordeum leporinum**	0.1	10	EX								0.1		
Vittadinia cuneata var. cuneata	0.1	10	FG					0.1					
Austrostipa scabra subsp. scabra	0.1	5	GG				0.1						
Daucus glochidiatus	0.1	5	FG					0.1					
Goodenia fascicularis	0.1	20	FG					0.1					
Asperula gemella	0.3	10	FG					0.3					
Eragrostis parviflora	1	20	GG				1						
Ranunculus sessiliflorus var. pilulifer	0.1	5	FG					0.1					
*Sisymbrium orientale**	0.5	30	EX								0.5		
*Cirsium vulgare**	0.1	5	EX								0.1		
*Helminthotheca echioides**	0.1	5	EX								0.1		
Alternanthera denticulata	0.1	5	FG					0.1					
Pseudognaphalium luteoalbum	0.1	5	FG					0.1					
*Marrubium vulgare**	0.1	5	EX								0.1		
Marsilea drummondii	0.1	20	EG						0.1				
Senecio runcinifolius	0.1	5	FG					0.1					
Euphorbia dallachyana	0.1	5	FG					0.1					
Atriplex semibaccata	1	20	SG			1							
*Solanum nigrum**	0.1	5	EX								0.1		
Rytidosperma caespitosum	0.1	10	GG				0.1						
Sclerolaena muricata var. semiglabra	0.2	10	SG			0.2							
Eleocharis pallens	0.1	10	GG				0.1						
Sclerolaena brachyptera	0.1	5	SG			0.1							
Atriplex pseudocampanulata	0.1	5	SG			0.1							

Easting	763674
Northing	6117316
Orientation	130
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	2
50-79	4
30-49	1
20-29	No
10-19	No
5-9	No
<5	Yes
Hollows	3
Length logs (m)	167
Attributes 1x1 plot (%)	
Litter (%)	20

D1.5 PCT 13 – Black Box – Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (Derived_No Offset)

VNI_DR125

Date	14/04/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_DR125		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	13		4	4	0	1	2	0	1	0	0	0	
Condition	Derived_No offset		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	61.2	61.2	0	0.1	61	0	0.1	0	0	0	
Walwhalleya proluta	60	1000	GG				60						
Eragrostis brownii	1	50	GG				1						
Marsilea drummondii	0.1	5	EG						0.1				
Sclerolaena muricata var. semiglabra	0.1	5	SG			0.1							

Easting	763620
Northing	6108796
Orientation	175
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	3.4

VNI_MP05

Date	3/09/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_MP05		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	13		18	10	0	3	1	6	0	0	8	1	
Condition	Derived_No offset		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	47.5	12.1	0	10.6	0.1	1.4	0	0	35.4	0.1	
Atriplex pseudocampanulata	10	100	SG			10							
*Hordeum leporinum**	15	2000	EX								15		
*Lolium perenne**	5	500	EX								5		
*Cotula bipinnata**	10	1000	EX								10		
*Medicago praecox**	5	2000	EX								5		
Senecio glossanthus	0.2	100	FG					0.2					
*Spergularia rubra**	0.1	20	EX								0.1		
*Polygonum aviculare**	0.1	10	EX								0.1		
*Sonchus oleraceus**	0.1	20	EX								0.1		
Enchylaena tomentosa	0.5	50	SG			0.5							
Rhodanthe corymbiflora	0.8	50	FG					0.8					
Atriplex leptocarpa	0.1	50	SG			0.1							
Spergularia brevifolia	0.1	20	FG					0.1					
Crassula sieberiana	0.1	50	FG					0.1					
Plantago turrifera	0.1	5	FG					0.1					
Cressa australis	0.1	10	FG					0.1					
*Xanthium spinosum**	0.1	1	HT									0.1	
Rytidosperma caespitosum	0.1	5	GG				0.1						

Easting	762835
Northing	6096097
Orientation	165
Plot size	20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_MP06

Date	9/09/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_MP06		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	13		18	9	0	0	0	9	0	0	9	0	
Condition	Derived_No offset		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	57.9	2.2	0	0	0	2.2	0	0	55.7	0	
*Triticum aestivum**	5	100	EX								5		
*Lolium rigidum**	50	1000	EX								50		
*Medicago praecox**	0.1	10	EX								0.1		
*Echium plantagineum**	0.1	10	EX								0.1		
*Sonchus asper**	0.1	2	EX								0.1		
Senecio glossanthus	0.1	30	FG					0.1					
Senecio quadridentatus	0.1	10	FG					0.1					
Maireana ciliata	0.1	10	FG					0.1					
Vittadinia cuneata	0.1	10	FG					0.1					
Sida corrugata	0.1	20	FG					0.1					
Rhodanthe corymbiflora	1	200	FG					1					
Einadia nutans	0.5	25	FG					0.5					
*Lepidium africanum**	0.1	2	EX								0.1		
Calotis scabiosifolia	0.1	5	FG					0.1					
*Cirsium vulgare**	0.1	5	EX								0.1		
*Spergularia rubra**	0.1	5	EX								0.1		
Bulbine semibarbata	0.1	10	FG					0.1					
*Sisymbrium orientale**	0.1	10	EX								0.1		

Easting	762835
Northing	6096097
Orientation	214
Plot size	20 X 20
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	0
10-19	0
5-9	0
<5	0
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	1

VNI_MP34

Date	14/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_MP34		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	13		14	10	0	3	2	5	0	0	4	0	
Condition	Derived_No offset		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	47.1	33	0	1.2	25.1	6.7	0	0	14.1	0	
Rytidosperma setaceum	25	250	GG				25						
*Lolium rigidum**	4	150	EX								4		
*Hordeum leporinum**	5	150	EX								5		
Atriplex pseudocampanulata	0.1	10	SG			0.1							
Einadia nutans	1	100	FG					1					
*Cotula bipinnata**	0.1	100	EX								0.1		
Rhodanthe corymbiflora	5	150	FG					5					
Atriplex semibaccata	1	100	SG			1							
*Medicago praecox**	5	200	EX								5		
Plantago turrifera	0.5	25	FG					0.5					
Austrostipa scabra	0.1	10	GG				0.1						
Sclerolaena stelligera	0.1	5	SG			0.1							
Vittadinia cuneata	0.1	1	FG					0.1					
Cressa australis	0.1	1	FG					0.1					

Easting	762999
Northing	6095712
Orientation	305
Plot size	20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	1.4

VNI_MP53

Date	20/02/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_MP53		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	13		18	15	0	6	6	3	0	0	3	0	
Condition	Derived_No offset		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	53.6	53.3	0	5.9	46.7	0.7	0	0	0.3	0	
Rytidosperma caespitosum	35	100	GG				35						
Maireana brevifolia	5	100	SG			5							
Enteropogon acicularis	10	100	GG				10						
Austrostipa scabra	0.5	20	GG				0.5						
Sclerolaena muricata	0.5	15	SG			0.5							
Chloris truncata	0.1	20	GG				0.1						
*Aira spp.**	0.1	10	EX								0.1		
Rytidosperma setaceum	1	100	GG				1						
Sclerolaena stelligera	0.1	5	SG			0.1							
*Lolium spp.**	0.1	10	EX								0.1		
Solanum esuriale	0.5	50	FG					0.5					
Walwhalleya proluta	0.1	5	GG				0.1						
*Vulpia myuros**	0.1	10	EX								0.1		
Enchylaena tomentosa	0.1	5	SG			0.1							
Euphorbia drummondii	0.1	10	FG					0.1					
Vittadinia cuneata	0.1	1	FG					0.1					
Sclerolaena bicornis	0.1	1	SG			0.1							
Atriplex semibaccata	0.1	1	SG			0.1							

Easting	761313
Northing	6077626
Orientation	7
Plot size	20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	2

VNI_MP54

Date	19/02/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_MP54		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	13		19	15	0	5	6	4	0	0	4	0	
Condition	Derived_No offset		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	56	55.6	0	1.3	52.1	2.2	0	0	0.4	0	
Rytidosperma caespitosum	10	100	GG				10						
Maireana brevifolia	0.1	10	SG			0.1							
Enteropogon acicularis	25	100	GG				25						
Austrostipa scabra	10	100	GG				10						
Sclerolaena muricata	0.5	20	SG			0.5							
Sclerolaena bicornis	0.5	20	SG			0.5							
Chloris truncata	0.1	10	GG				0.1						
Rytidosperma setaceum	5	200	GG				5						
Sclerolaena stelligera	0.1	10	SG			0.1							
Solanum esuriale	1	100	FG					1					
Euphorbia drummondii	0.1	20	FG					0.1					
Enchylaena tomentosa	0.1	5	SG			0.1							
*Lolium spp.**	0.1	1	EX								0.1		
Sporobolus caroli	2	100	GG				2						
Sida corrugata	1	50	FG					1					
*Medicago praecox**	0.1	10	EX								0.1		
*Heliotropium europaeum**	0.1	5	EX								0.1		
Chrysocephalum apiculatum	0.1	1	FG					0.1					
*Avena spp.**	0.1	1	EX								0.1		

Easting	762192
Northing	6080595
Orientation	100
Plot size	20 X 20
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	No data

VNI_NM01

Date	3/09/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_NM01		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	13		11	5	0	2	0	3	0	0	6	0	
Condition	Derived_No offset		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	50.2	40.5	0	40.2	0	0.3	0	0	9.7	0	
Atriplex pseudocampanulata	40	300	SG			40							
*Hordeum leporinum**	2	500	EX								2		
*Medicago praecox**	2	2000	EX								2		
*Cotula bipinnata**	0.5	500	EX								0.5		
*Lolium perenne**	5	1000	EX								5		
Atriplex leptocarpa	0.2	20	SG			0.2							
Rhodanthe corymbiflora	0.1	20	FG					0.1					
*Spergularia rubra**	0.1	10	EX								0.1		
*Sisymbrium irio**	0.1	10	EX								0.1		
Plantago turrifera	0.1	10	FG					0.1					
Senecio glossanthus	0.1	10	FG					0.1					

Easting	762592
Northing	6096144
Orientation	183
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	0
10-19	0
5-9	0
<5	0
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_NM025

Date	14/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_NM025		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	13		20	11	0	3	1	7	0	0	9	0	
Condition	Derived_No offset		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	56.5	22.7	0	10.2	10	2.5	0	0	33.8	0	
Rhodanthe corymbiflora	1	500	FG					1					
Rytidosperma setaceum	10	500	GG				10						
*Lolium rigidum**	20	1000	EX								20		
Senecio glossanthus	0.1	20	FG					0.1					
Atriplex pseudocampanulata	10	100	SG			10							
*Cerastium vulgare**	0.1	10	EX								0.1		
Spergularia brevifolia	0.1	50	FG					0.1					
Plantago turrifera	1	100	FG					1					
*Medicago praecox**	1	100	EX								1		
*Cotula bipinnata**	0.5	100	EX								0.5		
*Sonchus oleraceus**	0.1	10	EX								0.1		
*Vulpia bromoides**	1	500	EX								1		
*Phalaris minor**	1	50	EX								1		
*Hordeum leporinum**	10	500	EX								10		
Vittadinia cuneata	0.1	10	FG					0.1					
Sclerolaena muricata	0.1	10	SG			0.1							
Goodenia pinnatifida	0.1	10	FG					0.1					
Atriplex leptocarpa	0.1	10	SG			0.1							
*Bromus rubens**	0.1	10	EX								0.1		
Cressa australis	0.1	1	FG					0.1					

Easting	762968
Northing	6095536
Orientation	100
Plot size	20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	0
10-19	0
5-9	0
<5	0
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_OZ29

Date	14/04/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_OZ29		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	13		17	14	0	7	2	5	0	0	3	1	
Condition	Derived_No offset		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	27.3	27	0	25.4	1.1	0.5	0	0	0.3	0.1	
Duma florulenta	10	20	SG			10							
Chenopodium nitrariaceum	10	30	SG			10							
Enteropogon acicularis	1	200	GG				1						
Sclerolaena muricata var. semiglabra	5	50	SG			5							
Solanum esuriale	0.1	100	FG					0.1					
Teucrium racemosum	0.1	30	FG					0.1					
Atriplex spp.	0.1	1	SG			0.1							
Maireana decalvans	0.1	1	SG			0.1							
Euphorbia drummondii	0.1	1	FG					0.1					
*Heliotropium europaeum**	0.1	5	EX								0.1		
Atriplex leptocarpa	0.1	1	SG			0.1							
Atriplex spp.	0.1	10	SG			0.1							
Sida trichopoda	0.1	1	FG					0.1					
*Xanthium spinosum**	0.1	1	HT									0.1	
Walwhalleya proluta	0.1	5	GG				0.1						
Oxalis spp.	0.1	5	FG					0.1					
*Hordeum leporinum**	0.1	10	EX								0.1		

Easting	763768
Northing	6109447
Orientation	262
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	3
Attributes 1x1 plot (%)	
Litter (%)	5.8

VNI_OZ30

Date	14/04/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_OZ30		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	13		9	7	0	3	2	2	0	0	2	1	
Condition	Derived_No offset		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	6.5	6.3	0	2.1	4	0.2	0	0	0.2	0.1	
Duma florulenta	1	2	SG			1							
Sclerolaena muricata var. semiglabra	1	10	SG			1							
Enteropogon acicularis	2	25	GG				2						
Walwhalleya proluta	2	25	GG				2						
Cressa australis	0.1	1	FG					0.1					
Sclerolaena spp.	0.1	1	SG			0.1							
*Xanthium spinosum**	0.1	1	HT									0.1	
Solanum esuriale	0.1	2	FG					0.1					
*Medicago sp.**	0.1	10	EX								0.1		

Easting	763715
Northing	6109163
Orientation	197
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	1.4

D1.6 PCT 13 – Black Box – Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (Moderate_good)

VNI_DR16

Date	17/04/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_DR16		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	13		12	12	1	7	0	3	1	0	0	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	14.2	14.2	5	8.8	0	0.3	0.1	0	0	0	
Eucalyptus largiflorens	5	9	TG		5								
Duma florulenta	5	30	SG			5							
Chenopodium nitrariaceum	3	10	SG			3							
Solanum esuriale	0.1	20	FG					0.1					
Atriplex semibaccata	0.2	20	SG			0.2							
Sclerolaena stelligera	0.1	20	SG			0.1							
Maireana decalvans	0.1	2	SG			0.1							
Einadia nutans	0.1	10	FG					0.1					
Calocephalus sonderi	0.1	5	FG					0.1					
Atriplex leptocarpa	0.1	5	SG			0.1							
Sclerolaena muricata var. muricata	0.3	2	SG			0.3							
Marsilea drummondii	0.1	10	EG						0.1				

Easting	757565
Northing	6088900
Orientation	230
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	11
10-19	Yes
5-9	Yes
<5	No
Hollows	0
Length logs (m)	5
Attributes 1x1 plot (%)	
Litter (%)	2

VNI_DR17

Date	17/04/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_DR17		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	13		7	7	1	5	0	1	0	0	0	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	52	52	50	1.9	0	0.1	0	0	0	0	
Eucalyptus largiflorens	50	100	TG		50								
Duma florulenta	0.4	5	SG			0.4							
Chenopodium nitrariaceum	0.2	1	SG			0.2							
Maireana decalvans	0.2	20	SG			0.2							
Einadia nutans	0.1	5	FG					0.1					
Sclerolaena stelligera	0.1	5	SG			0.1							
Eremophila divaricata	1	10	SG			1							

Easting	757468
Northing	6089099
Orientation	110
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	1
10-19	Yes
5-9	Yes
<5	Yes
Hollows	0
Length logs (m)	6
Attributes 1x1 plot (%)	
Litter (%)	2.4

VNI_DR19

Date	17/04/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_DR19		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	13		7	7	1	4	0	1	1	0	0	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	12.4	12.4	5	7.2	0	0.1	0.1	0	0	0	
Eucalyptus largiflorens	5	20	TG		5								
Duma florulenta	5	30	SG			5							
Chenopodium nitrariaceum	2	10	SG			2							
Atriplex semibaccata	0.1	20	SG			0.1							
Einadia nutans	0.1	5	FG					0.1					
Marsilea drummondii	0.1	5	EG						0.1				
Sclerolaena stelligera	0.1	5	SG			0.1							

Easting	758643
Northing	6087454
Orientation	5
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	1
30-49	2
20-29	No
10-19	Yes
5-9	Yes
<5	Yes
Hollows	0
Length logs (m)	7
Attributes 1x1 plot (%)	
Litter (%)	8

VNI_MP10

Date	9/09/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_MP10		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	13		33	24	1	7	1	15	0	0	9	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	11.1	9.2	3	1.6	0.1	4.5	0	0	1.9	0	
Eucalyptus largiflorens	3	3	TG		3								
Sclerochlamys brachyptera	0.1	20	SG			0.1							
Isoetopsis graminifolia	0.1	20	FG					0.1					
Atriplex semibaccata	0.1	20	SG			0.1							
Crassula sieberiana	0.1	300	FG					0.1					
Senecio glossanthus	0.1	200	FG					0.1					
Pogonolepis muelleriana	0.1	10	FG					0.1					
Erodium crinitum	0.1	1	FG					0.1					
Sclerolaena muricata	0.1	10	SG			0.1							
Rhodanthe corymbiflora	0.1	100	FG					0.1					
Spergularia brevifolia	0.2	200	FG					0.2					
*Spergularia rubra**	0.1	20	EX								0.1		
*Cotula bipinnata**	0.2	200	EX								0.2		
Atriplex pseudocampanulata	0.1	10	SG			0.1							
Atriplex leptocarpa	1	50	SG			1							
*Vulpia bromoides**	0.1	50	EX								0.1		
Brachyscome lineariloba	0.1	1	FG					0.1					
Einadia nutans	3	100	FG					3					
Plantago turrifera	0.1	50	FG					0.1					
*Sonchus oleraceus**	0.1	5	EX								0.1		
Sida corrugata	0.1	10	FG					0.1					
Goodenia spp.	0.1	10	FG					0.1					
Duma florulenta	0.1	10	SG			0.1							
Rytidosperma spp.	0.1	50	GG				0.1						
Enchylaena tomentosa	0.1	50	SG			0.1							
Maireana ciliata	0.1	50	FG					0.1					
*Sisymbrium irio**	0.1	50	EX								0.1		
*Lepidium africanum**	0.1	20	EX								0.1		
*Hordeum leporinum**	0.1	50	EX								0.1		
*Lolium rigidum**	1	30	EX								1		
Vittadinia cuneata	0.1	10	FG					0.1					
Brachyscome spp.	0.1	1	FG					0.1					
*Conyza bonariensis**	0.1	5	EX								0.1		

Easting	730005
Northing	6107048
Orientation	237
Plot size	20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	0
10-19	Yes
5-9	Yes
<5	Yes
Hollows	0
Length logs (m)	31
Attributes 1x1 plot (%)	
Litter (%)	18.6

VNI_MP32

Date	14/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_MP32		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	13		26	20	1	7	1	11	0	0	6	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	52.5	46.3	40	3.9	0.1	2.3	0	0	6.2	0	
Eucalyptus largiflorens	40	15	TG		40								
Duma florulenta	1	100	SG			1							
Rhodanthe corymbiflora	0.1	2	FG					0.1					
Rytidosperma setaceum	0.1	25	GG				0.1						
Einadia nutans	0.1	25	FG					0.1					
Sclerolaena stelligera	0.5	25	SG			0.5							
Maireana brevifolia	0.1	25	SG			0.1							
Plantago turrifera	0.5	150	FG					0.5					
*Sonchus oleraceus**	0.1	25	EX								0.1		
Sida corrugata	0.1	10	FG					0.1					
*Sisymbrium irio**	0.1	25	EX								0.1		
Atriplex semibaccata	2	50	SG			2							
Goodenia pinnatifida	0.1	30	FG					0.1					
Pseudognaphalium luteoalbum	0.1	5	FG					0.1					
Sclerolaena muricata	0.1	5	SG			0.1							
*Vulpia myuros**	3	100	EX								3		
*Hordeum leporinum**	0.5	150	EX								0.5		
Crassula colorata	0.5	150	FG					0.5					
Calotis scabiosifolia	0.1	20	FG					0.1					
*Limonium lobatum**	0.5	250	EX								0.5		
Nitraria billardierei	0.1	1	SG			0.1							
*Cotula australis**	0.1	5	FG					0.1					
Sclerolaena brachyptera	0.1	5	SG			0.1							
Oxalis perennans	0.1	1	FG					0.1					
*Medicago praecox**	2	100	EX								2		
Bulbine semibarbata	0.5	150	FG					0.5					

Easting	761165
Northing	6094654
Orientation	135
Plot size	20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	1
30-49	0
20-29	Yes
10-19	Yes
5-9	Yes
<5	Yes
Hollows	0
Length logs (m)	7
Attributes 1x1 plot (%)	
Litter (%)	14

VNI_NM038

Date	16/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_NM038		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	13		22	18	1	6	2	9	0	0	4	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	33.2	31.9	20	10.4	0.2	1.3	0	0	1.3	0	
Eucalyptus largiflorens	20	30	TG		20								
Duma florulenta	5	30	SG			5							
*Sisymbrium irio**	0.1	50	EX								0.1		
Rhodanthe corymbiflora	0.5	200	FG					0.5					
Eremophila divaricata	5	2	SG			5							
Senecio glossanthus	0.1	1	FG					0.1					
Atriplex leptocarpa	0.1	20	SG			0.1							
Enchylaena tomentosa	0.1	1	SG			0.1							
*Spergularia rubra**	0.1	50	EX								0.1		
Einadia nutans	0.1	5	FG					0.1					
*Lolium rigidum**	1	500	EX								1		
Nitraria billardierei	0.1	5	SG			0.1							
Goodenia pinnatifida	0.1	5	FG					0.1					
Calocephalus sonderi	0.1	1	FG					0.1					
Sclerolaena stelligera	0.1	1	SG			0.1							
Rytidosperma setaceum	0.1	3	GG				0.1						
Bulbine semibarbata	0.1	30	FG					0.1					
Enteropogon acicularis	0.1	20	GG				0.1						
Plantago turrifera	0.1	20	FG					0.1					
*Vulpia bromoides**	0.1	50	EX								0.1		
Crassula colorata	0.1	50	FG					0.1					
Sclerochlamys brachyptera	0.1	10	FG					0.1					

Easting	757348
Northing	6089905
Orientation	16
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	1
30-49	1
20-29	Yes
10-19	Yes
5-9	Yes
<5	Yes
Hollows	1
Length logs (m)	33
Attributes 1x1 plot (%)	
Litter (%)	12

VNI_NM039

Date	16/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_NM039		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	13		22	17	1	7	1	8	0	0	5	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	24.3	23.8	20	2.9	0.1	0.8	0	0	0.5	0	
Eucalyptus largiflorens	20	30	TG		20								
Rhodanthe corymbiflora	0.1	50	FG					0.1					
Nitraria billardierei	0.5	20	SG			0.5							
Sclerolaena muricata	1	30	SG			1							
Senecio glossanthus	0.1	50	FG					0.1					
*Cotula bipinnata**	0.1	50	EX								0.1		
*Sisymbrium irio**	0.1	50	EX								0.1		
Duma florulenta	1	20	SG			1							
Eremophila divaricata	0.1	10	SG			0.1							
Goodenia pinnatifida	0.1	30	FG					0.1					
Euphorbia drummondii	0.1	20	FG					0.1					
Einadia nutans	0.1	40	FG					0.1					
Plantago turrifera	0.1	20	FG					0.1					
*Lolium rigidum**	0.1	50	EX								0.1		
Atriplex leptocarpa	0.1	20	SG			0.1							
*Sonchus oleraceus**	0.1	10	EX								0.1		
Sclerochlamys brachyptera	0.1	20	FG					0.1					
Calocephalus sonderi	0.1	20	FG					0.1					
*Spergularia rubra**	0.1	20	EX								0.1		
Enchylaena tomentosa	0.1	10	SG			0.1							
Sclerolaena stelligera	0.1	10	SG			0.1							
Rytidosperma setaceum	0.1	10	GG				0.1						

Easting	757464
Northing	6089987
Orientation	337
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	3
30-49	8
20-29	Yes
10-19	Yes
5-9	No
<5	Yes
Hollows	6
Length logs (m)	61
Attributes 1x1 plot (%)	
Litter (%)	20

D1.7 PCT 13 – Black Box – Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (Planted Native Vegetation)

VNI_MP48

Date	18/02/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_MP48		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	13		25	13	3	5	3	2	0	0	12	1	
Condition	Planted Native Vegetation		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	94.9	92.5	40	51.6	0.3	0.6	0	0	2.4	0.1	
Eucalyptus camaldulensis	5	2	TG		5								
Eucalyptus largiflorens	25	10	TG		25								
Alectryon oleifolius	10	21	TG		10								
Atriplex nummularia	50	50	SG			50							
Einadia nutans	0.5	10	FG					0.5					
*Avena spp.**	0.5	100	EX								0.5		
Rhagodia spinescens	0.5	10	SG			0.5							
Chloris truncata	0.1	10	GG				0.1						
Enteropogon acicularis	0.1	30	GG				0.1						
Austrostipa scabra	0.1	1	GG				0.1						
Sclerolaena muricata	0.5	20	SG			0.5							
*Marrubium vulgare**	0.5	40	EX								0.5		
Duma florulenta	0.1	1	SG			0.1							
Enchylaena tomentosa	0.5	10	SG			0.5							
*Bromus diandrus**	0.1	50	HT									0.1	
*Chenopodium album**	0.1	20	EX								0.1		
*Heliotropium europaeum**	0.1	20	EX								0.1		
Solanum esuriale	0.1	20	FG					0.1					
*Hordeum leporinum**	0.1	10	EX								0.1		
*Aira spp.**	0.1	50	EX								0.1		
*Lactuca serriola**	0.1	30	EX								0.1		
*Cucumis myriocarpus subsp myriocarpus**	0.1	1	EX								0.1		
*Echium plantagineum**	0.1	20	EX								0.1		
*Lepidium africanum**	0.1	2	EX								0.1		
Sisymbrium irio*	0.5	100	EX								0.5		

Easting	762392
Northing	6101065
Orientation	300
Plot size	20 X 50
Attributes 20x50m plot	
Stem classes	
80+	1
50-79	7
30-49	5
20-29	Yes
10-19	Yes
5-9	Yes
<5	Yes
Hollows	0
Length logs (m)	7
Attributes 1x1 plot (%)	
Litter (%)	30

D1.8 PCT 15 – Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (Derived_No Offset)

VNI_DR76

Date	17/09/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_DR76		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	15		10	7	0	4	1	2	0	0	3	0	
Condition	Derived_No offset		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	55	19	0	3.7	15	0.3	0	0	36	0	
Austrostipa nodosa	15	200	GG				15						
Sclerolaena muricata var. semiglabra	1	10	SG			1							
Maireana brevifolia	1	5	SG			1							
*Hordeum leporinum**	25	2000	EX								25		
*Medicago sp.**	10	2000	EX								10		
Enchylaena tomentosa	1	5	SG			1							
Rhodanthe corymbiflora	0.1	10	FG					0.1					
Einadia nutans	0.2	5	FG					0.2					
*Marrubium vulgare**	1	10	EX								1		
Atriplex semibaccata	0.7	5	SG			0.7							

Easting	762315
Northing	6115999
Orientation	175
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_DR121

Date	11/04/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_DR121		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	15		19	15	0	5	4	6	0	0	4	0	
Condition	Derived_No offset		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	35.7	35.1	0	18	16.1	1	0	0	0.6	0	
Rytidosperma caespitosum	10	1000	GG				10						
Sclerolaena muricata var. semiglabra	10	500	SG			10							
Sclerolaena stelligera	3	500	SG			3							
Sida trichopoda	0.2	30	FG					0.2					
Euphorbia drummondii	0.1	40	FG					0.1					
Einadia nutans subsp. nutans	0.3	30	FG					0.3					
Atriplex semibaccata	2	30	SG			2							
Sporobolus caroli	4	100	GG				4						
Maireana brevifolia	2	20	SG			2							
Walwhalleya proluta	2	30	GG				2						
Solanum esuriale	0.2	50	FG					0.2					
*Hordeum leporinum**	0.1	50	EX								0.1		
*Heliotropium europaeum**	0.3	20	EX								0.3		
Oxalis perennans	0.1	10	FG					0.1					
*Cirsium vulgare**	0.1	5	EX								0.1		
Vittadinia spp.	0.1	5	FG					0.1					
Maireana decalvans	1	10	SG			1							
*Sonchus oleraceus**	0.1	10	EX								0.1		
Chloris truncata	0.1	5	GG				0.1						

Easting	762654
Northing	6095041
Orientation	175
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	4

VNI_DR126

Date	14/04/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_DR126		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	15		17	16	0	10	1	5	0	0	1	0	
Condition	Derived_No offset		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	9.9	9.8	0	8.6	0.1	1.1	0	0	0.1	0	
Rhagodia spinescens	1	2	SG			1							
Sclerolaena muricata var. semiglabra	2	20	SG			2							
Atriplex eardleyae	2	40	SG			2							
Maireana brevifolia	1	5	SG			1							
Maireana decalvans	0.2	10	SG			0.2							
Enchylaena tomentosa	1	10	SG			1							
Atriplex lindleyi	0.7	40	FG					0.7					
Atriplex leptocarpa	0.5	20	SG			0.5							
Salsola australis	0.1	5	SG			0.1							
Atriplex pseudocampanulata	0.6	20	SG			0.6							
*Heliotropium europaeum**	0.1	10	EX								0.1		
Solanum esuriale	0.1	5	FG					0.1					
Atriplex semibaccata	0.2	10	SG			0.2							
Euphorbia drummondii	0.1	5	FG					0.1					
Boerhavia coccinea	0.1	5	FG					0.1					
Austrostipa scabra subsp. scabra	0.1	10	GG				0.1						
Sida corrugata	0.1	5	FG					0.1					

Easting	763515
Northing	6111323
Orientation	210
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	34

VNI_GL01

Date	21/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_GL01		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	15		15	12	0	6	2	4	0	0	3	0	
Condition	Derived_No offset		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	21.6	16.4	0	10.4	0.2	5.8	0	0	5.2	0	
Sclerolaena muricata var. semiglabra	5	100	SG			5							
Sclerolaena muricata var. muricata	3	50	SG			3							
Oxalis perennans	5	200	FG					5					
*Medicago minima**	0.1	2	EX								0.1		
*Lolium perenne**	5	500	EX								5		
*Sonchus oleraceus**	0.1	5	EX								0.1		
Solanum esuriale	0.5	20	FG					0.5					
Senecio glossanthus	0.2	20	FG					0.2					
Sporobolus creber	0.1	1	GG				0.1						
Rhodanthe corymbiflora	0.1	3	FG					0.1					
Atriplex semibaccata	0.1	2	SG			0.1							
Chenopodium nitrariaceum	2	5	SG			2							
Duma florulenta	0.2	1	SG			0.2							
Sclerolaena stelligera	0.1	1	SG			0.1							
Rytidosperma caespitosum	0.1	1	GG				0.1						

Easting	758592
Northing	6091992
Orientation	215
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_GL02

Date	21/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_GL02		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	15		16	9	1	3	1	4	0	0	7	0	
Condition	Derived_No offset		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	71.9	0.9	0.1	0.3	0.1	0.4	0	0	71	0	
*Lolium perenne**	40	10000	EX								40		
*Hordeum leporinum**	30	5000	EX								30		
*Medicago laciniata**	0.5	100	EX								0.5		
*Malva parviflora**	0.2	20	EX								0.2		
Sporobolus caroli	0.1	1	GG				0.1						
Einadia nutans	0.1	1	FG					0.1					
Atriplex semibaccata	0.1	1	SG			0.1							
*Sonchus oleraceus**	0.1	10	EX								0.1		
Oxalis perennans	0.1	10	FG					0.1					
Rhodanthe corymbiflora	0.1	2	FG					0.1					
Sclerolaena stelligera	0.1	1	SG			0.1							
*Lepidium africanum**	0.1	2	EX								0.1		
Senecio glossanthus	0.1	1	FG					0.1					
Atriplex leptocarpa	0.1	1	SG			0.1							
Eucalyptus largiflorens	0.1	1	TG		0.1								
*Sisymbrium orientale**	0.1	1	EX								0.1		

Easting	758220
Northing	6091819
Orientation	293
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	Yes
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_GL03

Date	21/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_GL03		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	15		9	5	0	2	0	3	0	0	4	0	
Condition	Derived_No offset		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	57.5	5.4	0	5.1	0	0.3	0	0	52.1	0	
*Lolium perenne**	45	10000	EX								45		
*Hordeum leporinum**	2	500	EX								2		
*Sonchus oleraceus**	5	50	EX								5		
Enchylaena tomentosa	5	20	SG			5							
Rhodanthe corymbiflora	0.1	5	FG					0.1					
Sclerolaena muricata var. semiglabra	0.1	1	SG			0.1							
Vittadinia cuneata	0.1	10	FG					0.1					
*Medicago minima**	0.1	50	EX								0.1		
Solanum spp.	0.1	1	FG					0.1					

Easting	757721
Northing	6090592
Orientation	133
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_GL04

Date	21/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_GL04		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	15		11	7	0	2	1	4	0	0	4	0	
Condition	Derived_No offset		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	67.8	2.6	0	2.1	0.1	0.4	0	0	65.2	0	
*Lolium perenne**	60	10000	EX								60		
*Hordeum leporinum**	5	1000	EX								5		
Einadia nutans subsp. nutans	0.1	1	FG					0.1					
*Medicago praecox**	0.1	100	EX								0.1		
Enchylaena tomentosa	2	50	SG			2							
Vittadinia cuneata	0.1	5	FG					0.1					
Rhodanthe corymbiflora	0.1	10	FG					0.1					
*Sonchus oleraceus**	0.1	5	EX								0.1		
Rytidosperma caespitosum	0.1	3	GG				0.1						
Sida trichopoda	0.1	1	FG					0.1					
Scleroleana muricata var. semiglabra	0.1	1	SG			0.1							

Easting	757779
Northing	6090938
Orientation	191
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_MP36

Date	15/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_MP36		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	15		8	5	0	4	1	0	0	0	3	0	
Condition	Derived_No offset		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	73.3	36.2	0	1.2	35	0	0	0	37.1	0	
*Hordeum leporinum**	35	500	EX								35		
Austrostipa nodosa	35	250	GG				35						
*Marrubium vulgare**	0.1	5	EX								0.1		
Scleroleana muricata	0.5	10	SG			0.5							
Scleroleana muricata var. semiglabra	0.1	5	SG			0.1							
*Medicago praecox**	2	150	EX								2		
Maireana brevifolia	0.5	20	SG			0.5							
Atriplex leptocarpa	0.1	10	SG			0.1							

Easting	762340
Northing	6115891
Orientation	108
Plot size	20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	1

VNI_OZ28

Date	14/04/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_OZ28		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	15		13	8	0	3	0	5	0	0	5	1	
Condition	Derived_No offset		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	26.2	25.6	0	25.1	0	0.5	0	0	0.6	0.1	
Chenopodium nitrariaceum	15	50	SG			15							
Scleroleana muricata var. semiglabra	10	100	SG			10							
*Hordeum leporinum**	0.1	200	EX								0.1		
*Heliotropium europaeum**	0.1	100	EX								0.1		
*Medicago sp.**	0.1	1000	EX								0.1		
Solanum esuriale	0.1	50	FG					0.1					
*Xanthium spinosum**	0.1	2	HT									0.1	
Euphorbia drummondii	0.1	2	FG					0.1					
Atriplex leptocarpa	0.1	1	SG			0.1							
Oxalis spp.	0.1	10	FG					0.1					
Einadia nutans	0.1	1	FG					0.1					
Cressa australis	0.1	1	FG					0.1					
*Cucumis myriocarpus subsp myriocarpus**	0.2	1	EX								0.2		

Easting	763831
Northing	6110864
Orientation	312
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	6.4

D1.9 PCT 15 – Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (Moderate_good)

VNI_DR22

Date	30/04/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_DR22		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	15		22	18	1	11	1	5	0	0	4	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	32.3	31.6	3	25	0.1	3.5	0	0	0.7	0	
Eucalyptus largiflorens	3	3	TG		3								
Chenopodium nitrariaceum	5	10	SG			5							
Duma florulenta	0.2	10	SG			0.2							
Rhagodia spinescens	0.1	1	SG			0.1							
Sclerolaena muricata var. muricata	10	200	SG			10							
Maireana decalvans	5	50	SG			5							
Sclerolaena stelligera	0.2	20	SG			0.2							
*Conyza sp.**	0.1	5	EX								0.1		
Spergularia brevifolia	0.2	20	FG					0.2					
Atriplex semibaccata	3	20	SG			3							
Atriplex lindleyi	3	40	FG					3					
Salsola australis	0.1	5	SG			0.1							
Rytidosperma setaceum	0.1	5	GG				0.1						
Atriplex eardleyae	1	10	SG			1							
*Cucumis myriocarpus**	0.1	5	EX								0.1		
Calocephalus sonderi	0.1	5	FG					0.1					
Sclerolaena brachyptera	0.2	20	SG			0.2							
*Cirsium vulgare**	0.4	5	EX								0.4		
Einadia nutans	0.1	10	FG					0.1					
Roepera apiculata	0.2	20	SG			0.2							
*Lepidium africanum**	0.1	5	EX								0.1		
Centipeda cunninghamii	0.1	5	FG					0.1					

Easting	757797
Northing	6091182
Orientation	170
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	3
20-29	yes
10-19	no
5-9	no
<5	yes
Hollows	0
Length logs (m)	5
Attributes 1x1 plot (%)	
Litter (%)	9.4

VNI_DR23

Date	30/04/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_DR23		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	15		16	15	1	9	1	4	0	0	1	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	40.8	40.7	5	33.2	0.1	2.4	0	0	0.1	0	
Eucalyptus largiflorens	5	9	TG		5								
Chenopodium nitrariaceum	15	8	SG			15							
Rhagodia spinescens	5	20	SG			5							
Duma florulenta	2	10	SG			2							
Atriplex semibaccata	3	20	SG			3							
Maireana decalvans	4	30	SG			4							
Sclerolaena stelligera	0.8	20	SG			0.8							
Sclerolaena muricata var. semiglabra	2	20	SG			2							
Plantago turrifera	0.1	10	FG					0.1					
Enchylaena tomentosa	1	10	SG			1							
Einadia nutans	2	20	FG					2					
Alternanthera denticulata	0.1	5	FG					0.1					
Rytidosperma caespitosum	0.1	10	GG				0.1						
*Hordeum leporinum**	0.1	10	EX								0.1		
Atriplex leptocarpa	0.4	20	SG			0.4							
Sida trichopoda	0.2	5	FG					0.2					

Easting	758084
Northing	6091610
Orientation	280
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	2
20-29	Yes
10-19	Yes
5-9	No
<5	Yes
Hollows	0
Length logs (m)	33
Attributes 1x1 plot (%)	
Litter (%)	3

VNI_DR94

Date	21/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_DR94		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	15		20	15	1	3	1	10	0	0	5	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	27.7	26.3	20	0.9	1	4.4	0	0	1.4	0	
Eucalyptus largiflorens	20	30	TG		20								
Einadia nutans subsp. nutans	2	100	FG					2					
Paspalidium jubiflorum	1	30	GG				1						
Oxalis perennans	0.1	5	FG					0.1					
Centipeda minima	1	30	FG					1					
Chenopodium nitrariaceum	0.1	2	SG			0.1							
Wahlenbergia fluminalis	0.1	10	FG					0.1					
Centipeda crateriformis	0.4	20	FG					0.4					
Duma florulenta	0.2	1	SG			0.2							
Pseudognaphalium luteoalbum	0.1	5	FG					0.1					
*Fumaria capreolata**	0.1	5	EX								0.1		
Euphorbia drummondii	0.1	5	FG					0.1					
Spergularia brevifolia	0.1	5	FG					0.1					
Vittadinia gracilis	0.1	5	FG					0.1					
*Polygonum aviculare**	0.1	5	EX								0.1		
Sclerolaena muricata var. semiglabra	0.6	2	SG			0.6							
*Lepidium africanum**	1	20	EX								1		
*Sonchus oleraceus**	0.1	5	EX								0.1		
*Cirsium vulgare**	0.1	1	EX								0.1		
Alternanthera denticulata	0.4	20	FG					0.4					

Easting	758851
Northing	6092103
Orientation	335
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	4
20-29	Yes
10-19	Yes
5-9	Yes
<5	Yes
Hollows	1
Length logs (m)	83
Attributes 1x1 plot (%)	
Litter (%)	56

D1.10 PCT 15 – Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (Thinned)

VNI_DR21

Date	30/04/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54	Easting	758667
Plot Name	VNI_DR21		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count		Northing	6092162
PCT	15		14	13	1	9	0	3	0	0	1	0		Orientation	188
Condition	Thinned		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum		Plot size	20 X 20 X 50
Species	Cover	Abundance	21.3	21.2	5	15.9	0	0.3	0	0	0.1	0		Attributes 20x50m plot	
Eucalyptus largiflorens	5	6	TG		5									Stem classes	
Chenopodium nitrariaceum	5	4	SG			5								80+	0
Atriplex semibaccata	10	1000	SG			10								50-79	0
Sclerolaena stelligera	0.2	20	SG			0.2								30-49	2
Salsola australis	0.1	2	SG			0.1								20-29	Yes
Einadia nutans	0.1	10	FG					0.1						10-19	Yes
Rhagodia spinescens	0.1	1	SG			0.1								5-9	No
Sclerolaena brachyptera	0.1	5	SG			0.1								<5	No
Maireana decalvans	0.1	5	SG			0.1								Hollows	0
Euphorbia drummondii	0.1	5	FG					0.1						Length logs (m)	0
Solanum esuriale	0.1	1	FG					0.1							
Sclerolaena muricata var. muricata	0.1	1	SG			0.1								Attributes 1x1 plot (%)	
*Heliotropium europaeum**	0.1	10	EX								0.1			Litter (%)	1.8
Atriplex nummularia	0.2	1	SG			0.2									

VNI_DR95

Date	21/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54	Easting	758703
Plot Name	VNI_DR95		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count		Northing	6091961
PCT	15		27	17	1	10	0	6	0	0	10	0		Orientation	208
Condition	Thinned		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum		Plot size	20 X 20 X 50
Species	Cover	Abundance	41.6	9.9	2	6.3	0	1.6	0	0	31.7	0		Attributes 20x50m plot	
Eucalyptus largiflorens	2	4	TG		2									Stem classes	
Chenopodium nitrariaceum	0.4	5	SG			0.4								80+	0
Duma florulenta	0.1	1	SG			0.1								50-79	0
Salsola australis	0.4	30	SG			0.4								30-49	0
Einadia nutans subsp. nutans	1	30	FG					1						20-29	Yes
Atriplex leptocarpa	0.8	40	SG			0.8								10-19	Yes
*Lepidium africanum**	0.6	20	EX								0.6			5-9	No
Sclerolaena stelligera	1	50	SG			1								<5	Yes
*Lolium perenne**	25	1000	EX								25			Hollows	0
Atriplex semibaccata	2	50	SG			2								Length logs (m)	0
Oxalis perennans	0.2	40	FG					0.2							
*Medicago praecox**	1	1000	EX								1			Attributes 1x1 plot (%)	
Rhodanthe corymbiflora	0.1	5	FG					0.1						Litter (%)	12
*Malva parviflora**	0.6	10	EX								0.6				
*Hordeum leporinum**	4	200	EX								4				
Sclerolaena muricata var. semiglabra	0.7	10	SG			0.7									
*Cotula bipinnata**	0.1	10	EX								0.1				
*Polygonum aviculare**	0.1	10	EX								0.1				
Euphorbia drummondii	0.1	5	FG					0.1							
*Arctotheca calendula***	0.1	5	EX								0.1				
Solanum esuriale	0.1	5	FG					0.1							
*Sonchus asper**	0.1	10	EX								0.1				
Enchylaena tomentosa	0.2	20	SG			0.2									
Sclerolaena muricata var. muricata	0.6	20	SG			0.6									
Rhagodia spinescens	0.1	1	SG			0.1									
*Sonchus oleraceus**	0.1	10	EX								0.1				
Einadia nutans subsp. linifolia	0.1	10	FG					0.1							

VNI_DR96

Date	21/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_DR96		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	15		24	16	1	8	1	6	0	0	8	0	
Condition	Thinned		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	69.5	8.9	1	7.1	0.2	0.6	0	0	60.6	0	
Eucalyptus largiflorens	1	3	TG		1								
Rhagodia spinescens	5	10	SG			5							
Duma florulenta	0.2	1	SG			0.2							
Enchylaena tomentosa	1	30	SG			1							
Sclerolaena muricata var. semiglabra	0.3	10	SG			0.3							
*Lolium perenne**	45	2000	EX								45		
Rhodanthe corymbiflora	0.1	10	FG					0.1					
Sclerolaena stelligera	0.1	10	SG			0.1							
*Sonchus oleraceus**	0.1	10	EX								0.1		
Einadia nutans	0.1	5	FG					0.1					
*Sisymbrium officinale**	0.1	5	EX								0.1		
Maireana decalvans	0.2	10	SG			0.2							
Atriplex semibaccata	0.2	10	SG			0.2							
Oxalis perennans	0.1	20	FG					0.1					
Vittadinia cuneata var. hirsuta	0.1	10	FG					0.1					
*Medicago praecox**	0.1	50	EX								0.1		
*Hordeum leporinum**	15	1000	EX								15		
Rytidosperma caespitosum	0.2	30	GG				0.2						
*Malva parviflora**	0.1	5	EX								0.1		
Leiocarpa panaetioides	0.1	1	FG					0.1					
*Spergularia rubra**	0.1	5	EX								0.1		
Einadia nutans subsp. linifolia	0.1	5	FG					0.1					
Atriplex leptocarpa	0.1	5	SG			0.1							
*Cotula bipinnata**	0.1	5	EX								0.1		

Easting	758095
Northing	6091396
Orientation	210
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	Yes
5-9	Yes
<5	Yes
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	3

VNI_DR97

Date	21/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_DR97		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	15		15	11	1	6	0	4	0	0	4	0	
Condition	Thinned		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	38.9	16.7	3	12.4	0	1.3	0	0	22.2	0	
Eucalyptus largiflorens	3	2	TG		3								
Rhagodia spinescens	5	20	SG			5							
Chenopodium nitrariaceum	4	10	SG			4							
Maireana decalvans	0.5	20	SG			0.5							
Enchylaena tomentosa	2	30	SG			2							
Einadia nutans subsp. linifolia	1	60	FG					1					
*Sisymbrium orientale**	2	50	EX								2		
Atriplex semibaccata	0.5	10	SG			0.5							
*Lolium perenne**	20	1000	EX								20		
Rhodanthe corymbiflora	0.1	10	FG					0.1					
Sclerolaena muricata var. semiglabra	0.4	10	SG			0.4							
Vittadinia cuneata var. hirsuta	0.1	5	FG					0.1					
*Medicago sp.**	0.1	10	EX								0.1		
*Sonchus oleraceus**	0.1	10	EX								0.1		
Sida trichopoda	0.1	1	FG					0.1					

Easting	757901
Northing	6091021
Orientation	117
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	1
30-49	1
20-29	No
10-19	No
5-9	No
<5	Yes
Hollows	0
Length logs (m)	13
Attributes 1x1 plot (%)	
Litter (%)	5

D1.11 PCT 17 – Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (Moderate_good)

VNI_NM035

Date	16/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	NM035		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	17		20	12	0	7	2	3	0	0	8	1	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	68.6	62	0	61.5	0.2	0.3	0	0	6.6	0.1	
Duma florulenta	60	100	SG			60							
*Vulpia bromoides**	5	1000	EX								5		
*Hordeum leporinum**	1	500	EX								1		
*Cotula bipinnata**	0.1	100	EX								0.1		
Rytidosperma setaceum	0.1	20	GG				0.1						
Crassula colorata	0.1	50	FG					0.1					
Atriplex leptocarpa	0.1	20	SG			0.1							
Oxalis perennans	0.1	20	FG					0.1					
Sclerolaena muricata	0.1	20	SG			0.1							
Sclerolaena stelligera	0.1	20	SG			0.1							
*Bromus alopecuros**	0.1	10	EX								0.1		
Rhagodia spinescens	1	5	SG			1							
Enchylaena tomentosa	0.1	10	SG			0.1							
Enteropogon acicularis	0.1	10	GG				0.1						
*Bromus diandrus**	0.1	50	HT									0.1	
*Medicago praecox**	0.1	20	EX								0.1		
Atriplex semibaccata	0.1	1	SG			0.1							
*Cirsium vulgare**	0.1	10	EX								0.1		
*Sonchus oleraceus**	0.1	10	EX								0.1		
Rhodanthe corymbiflora	0.1	10	FG					0.1					

Easting	760677
Northing	6083551
Orientation	310
Plot size	20 X 20 X 50
AM Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
AM Attributes 1x1 plot (%)	
Litter (%)	N/A

D1.12 PCT 28 – White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone (Derived)

VNI_NM030

Date	15/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_NM030		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	28		11	2	0	2	0	0	0	0	9	0	
Condition	Derived		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	72.4	15	0	15	0	0	0	0	57.4	0	
Rhagodia spinescens	10	40	SG			10							
*Hordeum leporinum**	40	2000	EX								40		
*Vulpia bromoides**	10	3000	EX								10		
Enchylaena tomentosa	5	50	SG			5							
*Medicago praecox**	1	100	EX								1		
*Lolium rigidum**	1	100	EX								1		
*Schismus barbatus**	5	100	EX								5		
*Arctotheca calendula**	0.1	10	EX								0.1		
*Marrubium vulgare**	0.1	10	EX								0.1		
*Cucumis myriocarpus subsp myriocarpus**	0.1	10	EX								0.1		
*Sonchus oleraceus**	0.1	10	EX								0.1		

Easting	762028
Northing	6113970
Orientation	190
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

D1.13 PCT 28 – White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone (Derived – Tall Shrubland)

VNI_DR79

Date	17/09/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_DR79		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	28		26	19	1	11	0	7	0	0	7	1	
Condition	Derived - Tall shrubland		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	65.2	62.7	20	39.1	0	3.6	0	0	2.5	0.3	
Alectryon oleifolius subsp. canescens	20	50	TG		20								
Maireana brevifolia	20	60	SG			20							
Chenopodium nitrariaceum	0.5	1	SG			0.5							
Enchylaena tomentosa	10	50	SG			10							
Einadia nutans	2	100	FG					2					
Rhagodia spinescens	3	20	SG			3							
*Hordeum leporinum**	1	200	EX								1		
Maireana aphylla	1	10	SG			1							
*Sisymbrium orientale**	0.7	30	EX								0.7		
Sclerolaena tricuspis	1	20	SG			1							
Nitraria billardierei	2	5	SG			2							
Sclerolaena muricata var. semiglabra	0.5	10	SG			0.5							
Atriplex lindleyi	1	30	FG					1					
Atriplex semibaccata	0.8	20	SG			0.8							
Rhodanthe corymbiflora	0.1	10	FG					0.1					
*Cotula bipinnata**	0.2	40	EX								0.2		
Atriplex leptocarpa	0.1	10	SG			0.1							
Crassula sieberiana	0.1	10	FG					0.1					
*Medicago sp.**	0.1	30	EX								0.1		
Sclerolaena brachyptera	0.2	20	SG			0.2							
*Malva parviflora**	0.1	5	EX								0.1		
Maireana pentagona	0.2	30	FG					0.2					
Spergularia brevifolia	0.1	20	FG					0.1					
Bulbine bulbosa	0.1	5	FG					0.1					
*Marrubium vulgare**	0.1	1	EX								0.1		
*Lycium ferocissimum**	0.3	1	HT									0.3	

Easting	763412
Northing	6117338
Orientation	305
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	5
Attributes 1x1 plot (%)	
Litter (%)	39.4

D1.14 PCT 86 – Yellow Gum tall woodland of the Murray River floodplain, Riverina Bioregion (Moderate_good)

VNI_DR124

Date	14/04/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_DR124		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	86		22	21	1	12	1	7	0	0	1	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	36.1	36	2	31.3	0.1	2.6	0	0	0.1	0	
Eucalyptus leucoxylon subsp. pruinosa	2	1	TG		2								
Rhagodia spinescens	20	60	SG			20							
Nitraria billardierei	1	5	SG			1							
Enchylaena tomentosa	2	80	SG			2							
Solanum esuriale	0.1	20	FG					0.1					
Teucrium racemosum	0.1	10	FG					0.1					
Oxalis perennans	0.1	40	FG					0.1					
Sclerolaena muricata var. semiglabra	1	30	SG			1							
Einadia nutans subsp. nutans	2	50	FG					2					
Maireana pentagona	0.1	20	FG					0.1					
Maireana brevifolia	2	30	SG			2							
Atriplex semibaccata	1	40	SG			1							
Salsola australis	0.1	10	SG			0.1							
Atriplex eardleyae	1	60	SG			1							
Boerhavia coccinea	0.1	10	FG					0.1					
Sida corrugata	0.1	10	FG					0.1					
Atriplex leptocarpa	0.2	30	SG			0.2							
Rytidosperma spp.	0.1	20	GG				0.1						
Maireana aphylla	1	5	SG			1							
Maireana decalvans	1	20	SG			1							
*Hordeum leporinum**	0.1	10	EX								0.1		
Chenopodium nitrariaceum	1	1	SG			1							

Easting	763383
Northing	6112626
Orientation	315
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	1
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	1
Length logs (m)	5
Attributes 1x1 plot (%)	
Litter (%)	36

D1.15 PCT 160 – Nitre Goosefoot shrubland wetland on clays of the inland floodplains (Moderate_good)

VNI_MP39

Date	15/10/2024		**Covers**	**Native**	Trees	Shrubs	Grass	Forb	Fern	Other	**Exotic**	HighThreat	54	**Easting**	762072
Plot Name	VNI_MP39		**# spp**	**Count**	Count	Count	Count	Count	Count	Count	**Count**	Count		**Northing**	6113348
PCT	160		**9**	**5**	0	3	1	0	1	0	**4**	0		**Orientation**	184
Condition	Moderate-good		**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum		**Plot size**	20 X 20
Species	**Cover**	**Abundance**	**42.8**	**39.7**	0	35.6	4	0	0.1	0	**3.1**	0		**Attributes 20x50m plot**	
Chenopodium nitrariaceum	35	40	SG			35								**Stem classes**	
Rhagodia spinescens	0.5	1	SG			0.5								**80+**	N/A
Juncus spp.	4	100	GG				4							**50-79**	N/A
*Hordeum leporinum**	2	100	EX								2			**30-49**	N/A
Sclerolaena muricata	0.1	5	SG			0.1								**20-29**	N/A
*Vulpia myuros**	0.5	100	EX								0.5			**10-19**	N/A
*Medicago praecox**	0.5	100	EX								0.5			**5-9**	N/A
*Cotula bipinnata**	0.1	10	EX								0.1			**<5**	N/A
Marsilea drummondii	0.1	5	EG						0.1					**Hollows**	N/A
														Length logs (m)	N/A
														Attributes 1x1 plot (%)	
														Litter (%)	N/A

D1.16 PCT 163 – Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones (Moderate_good)

VNI_MP38

Date	15/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_MP38		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	163		17	9	0	6	1	2	0	0	8	1	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	90.1	75.8	0	64.7	0.1	11	0	0	14.3	0.1	
Rhagodia spinescens	8	35	SG			8							
Einadia nutans	8	50	FG					8					
Enchylaena tomentosa	0.1	10	SG			0.1							
Nitraria billardierei	55	50	SG			55							
*Lycium ferocissimum**	0.1	1	HT									0.1	
*Vulpia myuros**	0.1	20	EX								0.1		
Rytidosperma setaceum	0.1	10	GG				0.1						
Maireana pentagona	3	500	FG					3					
*Hordeum leporinum**	10	500	EX								10		
*Lolium rigidum**	0.5	100	EX								0.5		
*Medicago praecox**	2	100	EX								2		
Atriplex pseudocampanulata	1	25	SG			1							
*Cotula bipinnata**	0.5	150	EX								0.5		
Sclerolaena muricata	0.5	15	SG			0.5							
*Sonchus oleraceus**	0.1	10	EX								0.1		
*Bromus hordeaceus**	1	15	EX								1		
Maireana brevifolia	0.1	5	SG			0.1							

Easting	761937
Northing	6114114
Orientation	145
Plot size	20 X 20
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

VNI_MP43

Date	16/10/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_MP43		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	163		17	12	0	6	2	4	0	0	5	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	30.5	23.3	0	16.3	1.5	5.5	0	0	7.2	0	
Nitraria billardierei	15	8	SG			15							
*Cotula bipinnata**	0.1	150	EX								0.1		
*Lolium rigidum**	2	150	EX								2		
Rhagodia spinescens	0.5	20	SG			0.5							
Maireana ciliata	4	250	FG					4					
Rhodanthe corymbiflora	0.5	100	FG					0.5					
*Hordeum leporinum**	3	150	EX								3		
Austrostipa scabra	0.5	25	GG				0.5						
*Medicago praecox**	2	250	EX								2		
Maireana brevifolia	0.1	10	SG			0.1							
Sida corrugata	0.5	25	FG					0.5					
Rytidosperma setaceum	1	50	GG				1						
Atriplex semibaccata	0.1	25	SG			0.1							
Goodenia pinnatifida	0.5	150	FG					0.5					
Sclerolaena stelligera	0.5	25	SG			0.5							
Sclerolaena brachyptera	0.1	10	SG			0.1							
*Sonchus oleraceus**	0.1	15	EX								0.1		

Easting	757262
Northing	6089429
Orientation	175
Plot size	20 X 20
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

VNI_MP44

Date	16/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_MP44		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	163		15	11	0	7	0	4	0	0	4	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	28.2	21.1	0	16.4	0	4.7	0	0	7.1	0	
Nitraria billardierei	15	50	SG			15							
Rhagodia spinescens	0.5	25	SG			0.5							
Rhodanthe corymbiflora	4	200	FG					4					
Sclerolaena brachyptera	0.5	20	SG			0.5							
*Hordeum leporinum**	2	150	EX								2		
*Lolium rigidum**	2	150	EX								2		
*Medicago praecox**	3	250	EX								3		
Atriplex semibaccata	0.1	10	SG			0.1							
Sclerolaena stelligera	0.1	10	SG			0.1							
Maireana ciliata	0.5	25	FG					0.5					
Maireana brevifolia	0.1	5	SG			0.1							
Sclerolaena muricata	0.1	5	SG			0.1							
Goodenia spp.	0.1	2	FG					0.1					
Oxalis perennans	0.1	1	FG					0.1					
*Cotula bipinnata**	0.1	25	EX								0.1		

Easting	757305
Northing	6089254
Orientation	75
Plot size	20 X 20
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

VNI_NM027

Date	15/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_NM027		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	163		22	14	0	6	3	4	0	1	8	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	88.1	65.7	0	23.2	42	0.4	0	0.1	22.4	0	
Rhagodia spinescens	1	20	SG			1							
Enteropogon acicularis	1	20	GG				1						
*Medicago praecox**	1	100	EX								1		
Austrostipa nodosa	40	200	GG				40						
Sida corrugata	0.1	20	FG					0.1					
Nitraria billardierei	20	30	SG			20							
Convolvulus erubescens	0.1	20	OG							0.1			
*Hordeum leporinum**	10	500	EX								10		
*Vulpia bromoides**	10	500	EX								10		
*Limonium sinuatum**	0.1	20	EX								0.1		
*Lolium perenne**	1	50	EX								1		
Sclerolaena muricata	1	20	SG			1							
Enchylaena tomentosa	1	20	SG			1							
Rytidosperma setaceum	1	50	GG				1						
*Euphorbia sp.**	0.1	20	EX								0.1		
*Marrubium vulgare**	0.1	20	EX								0.1		
Vittadinia cuneata	0.1	10	FG					0.1					
Atriplex pseudocampanulata	0.1	10	SG			0.1							
Crassula colorata	0.1	50	FG					0.1					
Atriplex leptocarpa	0.1	10	SG			0.1							
*Hypochaeris glabra**	0.1	50	EX								0.1		
Maireana pentagona	0.1	10	FG					0.1					

Easting	762180
Northing	6115763
Orientation	126
Plot size	20 X 20 X 50
AM Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
AM Attributes 1x1 plot (%)	
Litter (%)	N/A

VNI_NM028

Date	15/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_NM028		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	163		18	11	0	5	3	2	0	1	7	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	68.3	31	0	30.4	0.3	0.2	0	0.1	37.3	0	
Sclerolaena muricata	30	200	SG			30							
*Hordeum leporinum**	30	2000	EX								30		
*Marrubium vulgare**	5	30	EX								5		
*Sisymbrium irio**	0.1	20	EX								0.1		
*Medicago praecox**	1	100	EX								1		
Enteropogon acicularis	0.1	20	GG				0.1						
*Schismus barbatus**	0.1	20	EX								0.1		
Austrostipa nodosa	0.1	20	GG				0.1						
Convolvulus erubescens	0.1	10	OG							0.1			
Enchylaena tomentosa	0.1	20	SG			0.1							
*Sonchus oleraceus**	0.1	20	EX								0.1		
Atriplex semibaccata	0.1	10	SG			0.1							
Crassula sieberiana	0.1	50	FG					0.1					
Chloris truncata	0.1	10	GG				0.1						
Atriplex leptocarpa	0.1	20	SG			0.1							
Sclerochlamys brachyptera	0.1	20	FG					0.1					
Rhagodia spinescens	0.1	10	SG			0.1							
*Lolium perenne**	1	50	EX								1		

Easting	762317
Northing	6115676
Orientation	178
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

VNI_NM031

Date	15/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_NM031		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	163		18	12	0	7	1	4	0	0	6	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	84.9	52.6	0	37.3	0.1	15.2	0	0	32.3	0	
Nitraria billardierei	30	100	SG			30							
Atriplex lindleyi	5	100	FG					5					
*Hordeum leporinum**	30	2000	EX								30		
Einadia nutans	10	100	FG					10					
Atriplex leptocarpa	1	50	SG			1							
Sclerolaena muricata	1	20	SG			1							
*Medicago praecox**	1	50	EX								1		
Rhagodia spinescens	5	50	SG			5							
Crassula sieberiana	0.1	50	FG					0.1					
*Lolium perenne**	1	100	EX								1		
*Cotula bipinnata**	0.1	50	EX								0.1		
Maireana pentagona	0.1	20	FG					0.1					
Rytidosperma setaceum	0.1	10	GG				0.1						
Sclerolaena tricuspis	0.1	10	SG			0.1							
Sclerolaena stelligera	0.1	10	SG			0.1							
*Vulpia bromoides**	0.1	20	EX								0.1		
Malacocera tricornis	0.1	10	SG			0.1							
*Limonium sinuatum**	0.1	10	EX								0.1		

Easting	761922
Northing	6113780
Orientation	222
Plot size	20 X 20 X 50
M Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
M Attributes 1x1 plot (%)	
Litter (%)	N/A

D1.17 PCT 164 – Cotton Bush open shrubland of the semi-arid (warm) zone (Moderate_good)

VNI_DR74

Date	17/09/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_DR74		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	164		8	2	0	1	1	0	0	0	6	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	83.1	26	0	25	1	0	0	0	57.1	0	
Sclerolaena muricata var. semiglabra	25	100	SG			25							
*Hordeum leporinum**	40	2000	EX								40		
*Medicago sp.**	5	1000	EX								5		
*Lolium rigidum**	10	1000	EX								10		
Sporobolus caroli	1	20	GG				1						
*Sonchus oleraceus**	0.1	5	EX								0.1		
*Cirsium vulgare**	1	2	EX								1		
*Capsella bursa-pastoris**	1	40	EX								1		

Easting	762128
Northing	6115071
Orientation	165
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_DR75

Date	17/09/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_DR75		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	164		11	8	0	4	2	2	0	0	3	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	55.8	20.8	0	19.2	1.4	0.2	0	0	35	0	
Sclerolaena muricata var. semiglabra	15	40	SG			15							
*Hordeum leporinum**	25	1000	EX								25		
*Medicago sp.**	5	1000	EX								5		
Austrostipa scabra subsp. scabra	1	50	GG				1						
*Lolium rigidum**	5	500	EX								5		
Vittadinia cuneata var. cuneata	0.1	5	FG					0.1					
Atriplex semibaccata	0.2	5	SG			0.2							
Enchylaena tomentosa	3	30	SG			3							
Sporobolus caroli	0.4	10	GG				0.4						
Rhodanthe corymbiflora	0.1	5	FG					0.1					
Atriplex pseudocampanulata	1	20	SG			1							

Easting	762191
Northing	6115298
Orientation	145
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_DR77

Date	17/09/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_DR77		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	164		14	10	0	6	2	2	0	0	4	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	60.1	19.6	0	11.5	3	5.1	0	0	40.5	0	
Sclerolaena muricata var. semiglabra	10	40	SG			10							
Atriplex lindleyi	5	50	FG					5					
*Hordeum leporinum**	30	1000	EX								30		
Sporobolus caroli	1	20	GG				1						
Rhodanthe corymbiflora	0.1	10	FG					0.1					
*Cotula bipinnata**	0.5	100	EX								0.5		
*Medicago sp.**	5	1000	EX								5		
Atriplex semibaccata	0.7	5	SG			0.7							
*Lolium rigidum**	5	500	EX								5		
Enchylaena tomentosa	0.2	1	SG			0.2							
Enteropogon acicularis	2	20	GG				2						
Atriplex pseudocampanulata	0.4	10	SG			0.4							
Sclerolaena brachyptera	0.1	5	SG			0.1							
Osteocarpum acropterum	0.1	5	SG			0.1							

Easting	762526
Northing	6117068
Orientation	205
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_DR78

Date	19/09/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54	Easting	763076
Plot Name	VNI_DR78		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count		Northing	6117212
PCT	164		25	17	0	8	3	6	0	0	8	0		Orientation	35
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum		Plot size	20 X 20 X 50
Species	Cover	Abundance	46.1	31.9	0	25.7	2.4	3.8	0	0	14.2	0		Attributes 20x50m plot	
Maireana aphylla	20	50	SG			20								Stem classes	
*Hordeum leporinum**	5	500	EX								5			80+	N/A
Nitraria billardierei	1	5	SG			1								50-79	N/A
Sclerolaena brachyptera	0.7	20	SG			0.7								30-49	N/A
*Lolium rigidum**	1	200	EX								1			20-29	N/A
Atriplex pseudocampanulata	1	30	SG			1								10-19	N/A
Maireana pentagona	1	100	FG					1						5-9	N/A
*Cotula bipinnata**	0.2	200	EX								0.2			<5	N/A
*Medicago sp.**	2	400	EX								2			Hollows	N/A
Maireana cheelii	0.1	10	SG			0.1								Length logs (m)	N/A
Atriplex lindleyi	1	20	FG					1							
Rytidosperma caespitosum	0.4	5	GG				0.4							Attributes 1x1 plot (%)	
*Mesembryanthemum nodiflorum**	0.6	50	EX								0.6			Litter (%)	N/A
*Vulpia myuros**	5	1000	EX								5				
Rhagodia spinescens	2	5	SG			2									
Austrostipa elegantissima	1	10	GG				1								
Einadia nutans	1	20	FG					1							
Atriplex semibaccata	0.8	20	SG			0.8									
Austrostipa scabra subsp. scabra	1	30	GG				1								
Rhodanthe corymbiflora	0.1	10	FG					0.1							
*Erodium cicutarium**	0.1	5	EX								0.1				
Oxalis perennans	0.2	20	FG					0.2							
Minuria cunninghamii	0.5	5	FG					0.5							
*Bromus rubens**	0.3	20	EX								0.3				
Sclerolaena tricuspis	0.1	5	SG			0.1									

VNI_MP35

Date	15/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54	Easting	762333
Plot Name	VNI_MP35		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count		Northing	6116522
PCT	164		17	12	0	5	5	1	1	0	5	0		Orientation	194
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum		Plot size	20 X 20
Species	Cover	Abundance	42.6	21.9	0	15.4	6.3	0.1	0.1	0	20.7	0		Attributes 20x50m plot	
Maireana aphylla	15	50	SG			15								Stem classes	
*Hordeum leporinum**	5	250	EX								5			80+	0
Austrostipa scabra	1	100	GG				1							50-79	0
*Lolium rigidum**	15	250	EX								15			30-49	0
Walwhalleya proluta	5	50	GG				5							20-29	No
*Medicago praecox**	0.5	150	EX								0.5			10-19	No
Sclerolaena muricata	0.1	5	SG			0.1								5-9	No
Atriplex pseudocampanulata	0.1	5	SG			0.1								<5	No
Rhodanthe corymbiflora	0.1	15	FG					0.1						Hollows	0
*Vulpia myuros**	0.1	50	EX								0.1			Length logs (m)	0
Atriplex leptocarpa	0.1	5	SG			0.1									
Enteropogon acicularis	0.1	5	GG				0.1							Attributes 1x1 plot (%)	
Rytidosperma setaceum	0.1	50	GG				0.1							Litter (%)	0
Eragrostis spp.	0.1	5	GG				0.1								
Marsilea drummondii	0.1	5	EG						0.1						
*Bromus hordeaceus**	0.1	10	EX								0.1				
Sclerolaena brachyptera	0.1	1	SG			0.1									

VNI_MP37

Date	15/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54	Easting	761985
Plot Name	VNI_MP37		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count		Northing	6114581
PCT	164		20	13	0	7	2	4	0	0	7	0		Orientation	118
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum		Plot size	20 X 20
Species	Cover	Abundance	69.4	61.6	0	59.3	0.2	2.1	0	0	7.8	0		Attributes 20x50m plot	
Maireana aphylla	55	75	SG			55								Stem classes	
Rhagodia spinescens	0.5	5	SG			0.5								80+	N/A
Nitraria billardierei	3	50	SG			3								50-79	N/A
Einadia nutans	1	50	FG					1						30-49	N/A
Atriplex pseudocampanulata	0.5	20	SG			0.5								20-29	N/A
Austrostipa elegantissima	0.1	10	GG				0.1							10-19	N/A
*Hordeum leporinum**	2	250	EX								2			5-9	N/A
*Vulpia myuros**	3	250	EX								3			<5	N/A
*Sonchus oleraceus**	0.1	50	EX								0.1			Hollows	N/A
*Medicago praecox**	2	250	EX								2			Length logs (m)	N/A
*Lolium rigidum**	0.5	100	EX								0.5				
*Limonium lobatum**	0.1	10	EX								0.1			Attributes 1x1 plot (%)	
*Cotula bipinnata**	0.1	100	EX								0.1			Litter (%)	N/A
Crassula colorata	0.5	250	FG					0.5							
Plantago turrifera	0.5	100	FG					0.5							
Maireana brevifolia	0.1	10	SG			0.1									
Sclerolaena muricata	0.1	5	SG			0.1									
Rhodanthe corymbiflora	0.1	25	FG					0.1							
Austrostipa nodosa	0.1	5	GG				0.1								
Atriplex semibaccata	0.1	5	SG			0.1									

VNI_NM026

Date	15/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_NM026		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	164		16	12	0	7	1	4	0	0	4	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	72.6	16.5	0	14.2	0.1	2.2	0	0	56.1	0	
Calotis hispidula	1	50	FG					1					
Enchylaena tomentosa	1	20	SG			1							
Sclerolaena muricata	10	100	SG			10							
*Hordeum leporinum**	50	2000	EX								50		
Sclerolaena tricuspis	1	30	SG			1							
Sclerochlamys brachyptera	1	50	FG					1					
*Lolium perenne**	5	100	EX								5		
Rhagodia spinescens	1	20	SG			1							
Atriplex lindleyi	0.1	20	FG					0.1					
Maireana excavata	1	20	SG			1							
*Medicago praecox**	1	100	EX								1		
Austrostipa nodosa	0.1	20	GG				0.1						
Atriplex pseudocampanulata	0.1	20	SG			0.1							
*Schismus barbatus**	0.1	20	EX								0.1		
Malacocera tricornis	0.1	10	SG			0.1							
Oxalis spp.	0.1	10	FG					0.1					

Easting	762402
Northing	6116720
Orientation	62
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

VNI_NM029

Date	15/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_NM029		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	164		21	15	0	6	2	7	0	0	6	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	101	92.8	0	81.2	10	1.6	0	0	8.2	0	
Maireana excavata	60	100	SG			60							
Rhagodia spinescens	10	50	SG			10							
Einadia nutans	1	50	FG					1					
Nitraria billardierei	10	50	SG			10							
*Medicago praecox**	1	50	EX								1		
*Hordeum leporinum**	5	100	EX								5		
Austrostipa elegantissima	5	100	GG				5						
Rytidosperma setaceum	5	100	GG				5						
Rhodanthe corymbiflora	0.1	50	FG					0.1					
*Lolium rigidum**	1	100	EX								1		
Sclerolaena muricata	1	50	SG			1							
*Sisymbrium irio**	0.1	20	EX								0.1		
*Cotula bipinnata**	0.1	50	EX								0.1		
Spergularia brevifolia	0.1	20	FG					0.1					
Maireana pentagona	0.1	100	FG					0.1					
Sclerochlamys brachyptera	0.1	20	FG					0.1					
Sclerolaena stelligera	0.1	10	SG			0.1							
Senecio glossanthus	0.1	10	FG					0.1					
Crassula sieberiana	0.1	100	FG					0.1					
Malacocera tricornis	0.1	10	SG			0.1							
*Vulpia bromoides**	1	100	EX								1		

Easting	762065
Northing	6114672
Orientation	53
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

D1.18 PCT 216 – Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion (Moderate-good)

VNI_NM036

Date	16/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_NM036		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	216		18	12	0	4	4	4	0	0	6	1	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	88	37.6	0	26.1	10.2	1.3	0	0	50.4	0.1	
Enteropogon acicularis	5	100	GG				5						
*Sonchus oleraceus**	0.1	20	EX								0.1		
Oxalis perennans	0.1	20	FG					0.1					
*Hordeum leporinum**	20	1000	EX								20		
*Lolium rigidum**	30	3000	EX								30		
Atriplex spp.	5	100	SG			5							
Sclerolaena muricata	20	100	SG			20							
*Xanthium spinosum**	0.1	20	HT									0.1	
*Medicago praecox**	0.1	50	EX								0.1		
Enchylaena tomentosa	0.1	20	SG			0.1							
Vittadinia cuneata	1	50	FG					1					
Walwhalleya proluta	0.1	10	GG				0.1						
Rhagodia spinescens	1	20	SG			1							
*Malva sp.**	0.1	20	EX								0.1		
Rytidosperma setaceum	0.1	20	GG				0.1						
Einadia nutans	0.1	20	FG					0.1					
Enteropogon acicularis	5	100	GG				5						
Rhodanthe corymbiflora	0.1	10	FG					0.1					

Easting	760830
Northing	60883278
Orientation	148
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

D1.19 PCT 237 – Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone (Moderate_good)

VNI_DR47

Date	6/05/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_DR47		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	237		17	13	4	4	1	4	0	0	4	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	60.1	56.8	10	21.4	2	23.4	0	0	3.3	0	
Eucalyptus microcarpa	7	3	TG		7								
Eucalyptus largiflorens	1	1	TG		1								
Eucalyptus camaldulensis	1	0	TG		1								
Chenopodium nitrariaceum	10	20	SG			10							
Einadia nutans	20	500	FG					20					
Atriplex lindleyi	0.4	5	FG					0.4					
*Solanum nigrum**	1	20	EX								1		
Sclerolaena muricata var. semiglabra	10	100	SG			10							
Paspalidium jubiflorum	2	20	GG				2						
Alternanthera denticulata	2	50	FG					2					
Salsola australis	1	20	SG			1							
Acacia salicina	1	5	TG		1								
*Cirsium vulgare**	2	20	EX								2		
Sclerolaena tricuspis	0.4	5	SG			0.4							
*Conyza sp.**	0.1	5	EX								0.1		
Centipeda cunninghamii	1	50	FG					1					
*Sonchus oleraceus**	0.2	10	EX								0.2		

Easting	763881
Northing	6117406
Orientation	280
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	3
50-79	1
30-49	0
20-29	no
10-19	no
5-9	no
<5	yes
Hollows	3
Length logs (m)	65
Attributes 1x1 plot (%)	
Litter (%)	47

VNI_NM034

Date	16/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	NM034		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	237		19	16	2	3	2	8	1	0	3	1	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	26.5	26.2	21	2.2	2.1	0.8	0.1	0	0.3	0.1	
Eucalyptus camaldulensis	1	5	TG		1								
Eucalyptus microcarpa	20	30	TG		20								
Wahlenbergia spp.	0.1	20	FG					0.1					
Paspalidium jubiflorum	2	30	GG				2						
Cynodon dactylon	0.1	20	GG				0.1						
Pseudognaphalium luteoalbum	0.1	10	FG					0.1					
*Sonchus oleraceus**	0.1	20	EX								0.1		
Eclipta platyglossa	0.1	10	FG					0.1					
Duma florulenta	2	5	SG			2							
Einadia nutans	0.1	1	FG					0.1					
Teucrium spp.	0.1	10	FG					0.1					
*Phyla canescens**	0.1	10	HT									0.1	
Goodenia pinnatifida	0.1	1	FG					0.1					
Marsilea drummondii	0.1	50	EG						0.1				
*Cirsium vulgare**	0.1	1	EX								0.1		
Enchylaena tomentosa	0.1	1	SG			0.1							
Euphorbia drummondii	0.1	10	FG					0.1					
Sclerolaena muricata	0.1	1	SG			0.1							
Vittadinia cuneata	0.1	2	FG					0.1					

Easting	760717
Northing	6083653
Orientation	295
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	2
30-49	9
20-29	Yes
10-19	Yes
5-9	No
<5	No
Hollows	1
Length logs (m)	50
Attributes 1x1 plot (%)	
Litter (%)	92

D2 Murrumbidgee IBRA

D2.1 PCT 13 – Black Box – Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (Moderate_good)

VNIOZ_10

Date	17/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55	Easting	372437
Plot Name	VNIOZ_10		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count		Northing	6123084
PCT	13		21	16	1	4	2	8	1	0	5	0		Orientation	236
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum		Plot size	20 X 20 X 50
Species	Cover	Abundance	36.9	36.4	10	25.2	0.3	0.8	0.1	0	0.5	0		Attributes 20x50m plot	
Eucalyptus largiflorens	10	1	TG		10									Stem classes	
Duma florulenta	15	20	SG			15								80+	1
Chenopodium nitrariaceum	10	15	SG			10								50-79	1
*Cotula bipinnata**	0.1	10	EX								0.1			30-49	15
Crassula sieberiana	0.1	100	FG					0.1						20-29	Yes
*Lolium perenne**	0.1	10	EX								0.1			10-19	No
Rytidosperma caespitosum	0.1	5	GG				0.1							5-9	No
Oxalis perennans	0.1	5	FG					0.1						<5	No
Marsilea drummondii	0.1	50	EG						0.1					Hollows	1
Sclerolaena tricuspis	0.1	1	SG			0.1								Length logs (m)	5
*Hordeum leporinum**	0.1	5	EX								0.1				
Rhagodia spinescens	0.1	1	SG			0.1								Attributes 1x1 plot (%)	
*Spergularia rubra**	0.1	10	EX								0.1			Litter (%)	11
Vittadinia cuneata	0.1	2	FG					0.1							
Eragrostis australasica	0.2	5	GG				0.2								
Einadia nutans	0.1	1	FG					0.1							
Rhodanthe corymbiflora	0.1	2	FG					0.1							
Ranunculus spp.	0.1	2	FG					0.1							
*Sonchus oleraceus**	0.1	1	EX								0.1				
Alternanthera nana	0.1	3	FG					0.1							
Vittadinia gracilis	0.1	1	FG					0.1							

VNI_OZ25

Date	9/04/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55	Easting	372264
Plot Name	VNI_OZ25		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count		Northing	6122991
PCT	13		16	15	1	6	1	6	1	0	1	0		Orientation	199
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum		Plot size	20 X 20 X 50
Species	Cover	Abundance	56.3	56.2	15	40.4	0.1	0.6	0.1	0	0.1	0		Attributes 20x50m plot	
Eucalyptus largiflorens	15	3	TG		15									Stem classes	
Chenopodium nitrariaceum	35	100	SG			35								80+	0
Duma florulenta	5	100	SG			5								50-79	5
Einadia nutans	0.1	5	FG					0.1						30-49	0
Sclerolaena muricata var. semiglabra	0.1	5	SG			0.1								20-29	Yes
Oxalis spp.	0.1	5	FG					0.1						10-19	Yes
Marsilea drummondii	0.1	20	EG						0.1					5-9	Yes
Alternanthera nana	0.1	1	FG					0.1						<5	Yes
Sclerolaena stelligera	0.1	3	SG			0.1								Hollows	5
Paspalidium jubiflorum	0.1	10	GG				0.1							Length logs (m)	20
*Lepidium africanum**	0.1	1	EX								0.1				
Leiocarpa spp.	0.1	1	FG					0.1						Attributes 1x1 plot (%)	
Atriplex semibaccata	0.1	1	SG			0.1								Litter (%)	45
Enchylaena tomentosa	0.1	1	SG			0.1									
Solanum esuriale	0.1	1	FG					0.1							
Sida corrugata	0.1	1	FG					0.1							

D2.2 PCT 15 – Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (Derived)

VNI_DR66

Date	30/08/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55	Easting	232802
Plot Name	VNI_DR66		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count		Northing	6121436
PCT	15		22	15	0	6	3	6	0	0	7	0		Orientation	80
Condition	Derived		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum		Plot size	20 X 20 X 50
Species	Cover	Abundance	78.7	42.7	0	32.5	7.4	2.8	0	0	36	0		Attributes 20x50m plot	
Chenopodium nitrariaceum	3	3	SG			3								Stem classes	
Nitraria billardierei	3	5	SG			3								80+	0
Sclerolaena muricata var. semiglabra	25	60	SG			25								50-79	0
*Hordeum leporinum**	30	2000	EX								30			30-49	0
Oxalis perennans	1	500	FG					1						20-29	No
*Vulpia myuros**	0.3	50	EX								0.3			10-19	No
*Erodium cicutarium**	0.4	20	EX								0.4			5-9	No
Austrostipa scabra subsp. scabra	5	100	GG				5							<5	No
*Medicago laciniata**	5	5000	EX								5			Hollows	0
Enteropogon acicularis	0.4	10	GG				0.4							Length logs (m)	0
Rhagodia spinescens	1	2	SG			1									
*Sisymbrium orientale**	0.1	5	EX								0.1			Attributes 1x1 plot (%)	
Einadia nutans	1	10	FG					1						Litter (%)	0
Rhodanthe corymbiflora	0.4	50	FG					0.4							
Calotis hispidula	0.1	10	FG					0.1							
Maireana decalvans	0.3	5	SG			0.3									
Malacocera tricornis	0.2	1	SG			0.2									
Maireana pentagona	0.1	5	FG					0.1							
*Malva parviflora**	0.1	5	EX								0.1				
Atriplex lindleyi	0.2	1	FG					0.2							
*Lamarckia aurea**	0.1	10	EX								0.1				
Austrostipa nodosa	2	20	GG				2								

VNI_MP22

Date	11/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55	Easting	278701
Plot Name	VNI_MP22		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count		Northing	6118984
PCT	15		13	8	0	6	1	1	0	0	5	0		Orientation	74
Condition	Derived		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum		Plot size	20 x 50
Species	Cover	Abundance	54	41.4	0	40.3	0.1	1	0	0	12.6	0		Attributes 20x50m plot	
Atriplex nummularia	38	50	SG			38								Stem classes	
*Hordeum leporinum**	8	250	EX								8			80+	0
Rhodanthe corymbiflora	1	200	FG					1						50-79	0
Sclerolaena muricata	0.1	25	SG			0.1								30-49	0
*Lolium rigidum**	3	150	EX								3			20-29	No
*Vulpia myuros**	1	150	EX								1			10-19	No
*Medicago praecox**	0.5	50	EX								0.5			5-9	No
*Cotula bipinnata**	0.1	100	EX								0.1			<5	No
Atriplex lindleyi	1	20	SG			1								Hollows	0
Sclerolaena tricuspis	1	10	SG			1								Length logs (m)	0
Rhagodia spinescens	0.1	1	SG			0.1									
Atriplex spp.	0.1	3	SG			0.1								Attributes 1x1 plot (%)	
Rytidosperma caespitosum	0.1	5	GG				0.1							Litter (%)	42

VNI_MP45

Date	18/02/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55	Easting	278589
Plot Name	VNI_MP45		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count		Northing	6118934
PCT	15		10	7	0	5	1	1	0	0	3	0		Orientation	98
Condition	Derived		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum		Plot size	20x50
Species	Cover	Abundance	31.5	30.3	0	25.2	5	0.1	0	0	1.2	0		Attributes 20x50m plot	
Sclerolaena tricuspis	5	50	SG			5								Stem classes	
Atriplex nummularia	15	100	SG			15								80+	0
Rytidosperma caespitosum	5	250	GG				5							50-79	0
Atriplex spp	5	150	SG			5								30-49	0
Einadia nutans	0.1	1	FG					0.1						20-29	No
*Hordeum leporinum**	1	200	EX								1			10-19	No
Nitraria billardierei	0.1	2	SG			0.1								5-9	No
*Medicago laciniata**	0.1	10	EX								0.1			<5	No
*Medicago praecox**	0.1	10	EX								0.1			Hollows	0
Rhagodia spinescens	0.1	1	SG			0.1								Length logs (m)	0
														Attributes 1x1 plot (%)	
														Litter (%)	16

VNI_MP46

Date	18/02/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_MP46		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	15		7	5	0	3	0	2	0	0	2	0	
Condition	Derived		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	48.1	47.1	0	46	0	1.1	0	0	1	0	
Sclerolaena tricuspis	1	15	SG			1							
Atriplex nummularia	5	100	SG			5							
Rhodanthe corymbiflora	0.1	1	FG					0.1					
Atriplex spp	40	100	SG			40							
Hordeum leporinum *	0.5	50	EX								0.5		
Medicago praecox *	0.5	200	EX								0.5		
Einadia nutans	1	10	FG					1					

Easting	274665
Northing	6122002
Orientation	280
Plot size	20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	32

D2.3 PCT 15 – Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (Moderate_good)

VNI_DR04

Date	31/01/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR04		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	15		16	14	1	6	4	2	1	0	1	1	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	44.3	43.2	15	15.6	11.3	0.3	1	0	0.1	1	
Eucalyptus largiflorens	15	9	TG		15								
Chenopodium nitrariaceum	5	10	SG			5							
Lycium ferocissimum *	1	1	HT									1	
Duma florulenta	1	10	SG			1							
Enteropogon acicularis	10	50	GG				10						
Sclerolaena muricata var. *semiglabra*	8	50	SG			8							
Marsilea drummondii	1	500	EG						1				
Atriplex semibaccata	1	5	SG			1							
Sclerolaena stelligera	0.5	20	SG			0.5							
*Polygonum aviculare**	0.1	5	EX								0.1		
Eleocharis pusilla	0.1	10	GG				0.1						
Paspalidium jubiflorum	1	20	GG				1						
Einadia nutans	0.1	5	FG					0.1					
Carex inversa	0.2	50	GG				0.2						
Enchylaena tomentosa	0.1	5	SG			0.1							
Centipeda minima	0.2	10	FG					0.2					

Easting	371569
Northing	6122866
Orientation	170
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	3
30-49	4
20-29	yes
10-19	yes
5-9	yes
<5	no
Hollows	3
Length logs (m)	38
BAM Attributes 1x1 plot (%)	
Litter (%)	7

VNI_DR54

Date	27/08/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR54		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	15		19	13	1	5	2	4	1	0	6	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	43.5	35.9	25	8.2	1.1	1.5	0.1	0	7.6	0	
Eucalyptus largiflorens	25	3	TG		25								
Duma florulenta	2	10	SG			2							
Chenopodium nitrariaceum	5	20	SG			5							
Sclerolaena muricata	1	10	SG			1							
*Lolium perenne**	5	1000	EX								5		
*Cotula bipinnata**	2	500	EX								2		
Crassula sieberiana	0.1	100	FG					0.1					
Rhodanthe corymbiflora	1	1000	FG					1					
Eleocharis plana	1	1000	GG				1						
Marsilea drummondii	0.1	20	EG						0.1				
*Hypochaeris radicata**	0.1	2	EX								0.1		
Ranunculus pentandrus var. *platycarpu*	0.3	100	FG					0.3					
*Medicago laciniata**	0.1	100	EX								0.1		
*Sonchus oleraceus**	0.1	5	EX								0.1		
Maireana decalvans	0.1	5	SG			0.1							
Sclerolaena stelligera	0.1	5	SG			0.1							
*Spergularia rubra**	0.3	20	EX								0.3		
Sporobolus caroli	0.1	2	GG				0.1						
Sida trichopoda	0.1	5	FG					0.1					

Easting	367004
Northing	6121213
Orientation	250
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	3
30-49	1
20-29	Yes
10-19	No
5-9	No
<5	No
Hollows	3
Length logs (m)	25
Attributes 1x1 plot (%)	
Litter (%)	16

VNI_DR68

Date	3/09/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR68		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	15		29	22	2	10	3	6	0	1	7	1	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	68.7	50.5	7	34.8	1.5	7	0	0.2	18.2	2	
Eucalyptus largiflorens	3	4	TG		3								
Alectryon oleifolius subsp. canescens	4	3	TG		4								
Lysiana exocarpi subsp. exocarpi	0.2	2	OG							0.2			
Rhagodia spinescens	10	20	SG			10							
Einadia nutans	5	50	FG					5					
*Hordeum leporinum**	10	500	EX								10		
Enchylaena tomentosa	15	80	SG			15							
Crassula sieberiana	0.3	3000	FG					0.3					
*Schismus barbatus**	1	200	EX								1		
Sclerolaena muricata var. *semiglabra*	3	30	SG			3							
Salsola australis	0.4	10	SG			0.4							
*Sisymbrium officinale**	1	50	EX								1		
*Medicago laciniata**	2	2000	EX								2		
Sclerolaena diacantha	3	100	SG			3							
Calandrinia eremaea	0.2	100	FG					0.2					
Oxalis perennans	0.3	30	FG					0.3					
Atriplex semibaccata	1	20	SG			1							
Tetragonia eremaea	1	40	FG					1					
Sclerolaena muricata var. *villosa*	1	10	SG			1							
Juncus spp.	0.2	10	GG				0.2						
Malacocera tricornis	1	10	SG			1							
Austrostipa scabra subsp. scabra	0.3	20	GG				0.3						
*Medicago praecox**	2	2000	EX								2		
*Hypochaeris radicata**	0.2	20	EX								0.2		
Rytidosperma caespitosum	1	20	GG				1						
Atriplex vesicaria	0.2	1	SG			0.2							
*Lycium ferocissimum**	2	2	HT									2	
Rhodanthe moschata	0.2	20	FG					0.2					
Maireana brevifolia	0.2	1	SG			0.2							

Easting	268133
Northing	6126554
Orientation	280
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	2
20-29	No
10-19	Yes
5-9	No
<5	No
Hollows	1
Length logs (m)	17
Attributes 1x1 plot (%)	
Litter (%)	19.6

VNI_DR69

Date	3/09/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR69		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	15		31	24	1	9	3	10	1	0	7	1	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	57.6	52.5	5	39.4	0.7	7.3	0.1	0	5.1	1	
Eucalyptus largiflorens	5	5	TG		5								
Rhagodia spinescens	25	30	SG			25							
Einadia nutans	5	60	FG					5					
Teucrium racemosum	0.2	20	FG					0.2					
Sclerolaena diacantha	2	30	SG			2							
*Spergularia rubra**	0.3	40	EX								0.3		
Oxalis perennans	0.2	10	FG					0.2					
Rytidosperma caespitosum	0.4	20	GG				0.4						
*Medicago laciniata**	3	500	EX								3		
*Lycium ferocissimum**	1	5	HT									1	
Enchylaena tomentosa	5	100	SG			5							
Atriplex semibaccata	1	20	SG			1							
Juncus spp.	0.1	5	GG				0.1						
Sida trichopoda	0.1	5	FG					0.1					
Crassula sieberiana	0.1	100	FG					0.1					
Marsilea drummondii	0.1	10	EG						0.1				
Sclerolaena muricata var. semiglabra	2	20	SG			2							
*Hordeum leporinum**	0.4	20	EX								0.4		
Tetragonia eremaea	0.4	20	FG					0.4					
Calandrinia eremaea	0.1	20	FG					0.1					
Atriplex lindleyi	1	10	FG					1					
Atriplex vesicaria	0.3	1	SG			0.3							
Malacocera tricornis	3	40	SG			3							
Scleroblitum atriplicinum	0.1	10	FG					0.1					
*Schismus barbatus**	0.1	10	EX								0.1		
Vittadinia cuneata var. hirsuta	0.1	1	FG					0.1					
*Sisymbrium orientale**	0.2	20	EX								0.2		
Austrostipa scabra subsp. scabra	0.2	10	GG				0.2						
Chenopodium nitrariaceum	1	5	SG			1							
Sclerolaena muricata var. villosa	0.1	1	SG			0.1							
*Sonchus oleraceus**	0.1	5	EX								0.1		

Easting	268465
Northing	6126473
Orientation	80
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	5
20-29	Yes
10-19	Yes
5-9	Yes
<5	No
Hollows	2
Length logs (m)	20
Attributes 1x1 plot (%)	
Litter (%)	30.6

VNI_DR70

Date	3/09/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR70		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	15		26	19	1	11	2	5	0	0	7	1	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	54.9	50.1	5	23.8	0.7	20.6	0	0	4.8	1	
Eucalyptus largiflorens	5	4	TG		5								
Exocarpos aphyllus	2	2	SG			2							
Rhagodia spinescens	10	20	SG			10							
Einadia nutans	20	100	FG					20					
Atriplex pseudocampanulata	1	30	SG			1							
Sclerolaena muricata var. semiglabra	3	20	SG			3							
*Hordeum leporinum**	2	100	EX								2		
Sclerolaena muricata var. villosa	1	10	SG			1							
Enchylaena tomentosa	5	40	SG			5							
*Lycium ferocissimum**	1	3	HT									1	
Maireana brevifolia	0.2	1	SG			0.2							
Sclerolaena brachyptera	0.1	5	SG			0.1							
Sclerolaena diacantha	0.4	10	SG			0.4							
Rytidosperma caespitosum	0.5	10	GG				0.5						
*Medicago laciniata**	1	1000	EX								1		
Tetragonia eremaea	0.2	10	FG					0.2					
Atriplex semibaccata	1	20	SG			1							
Salsola australis	0.1	5	SG			0.1							
Crassula sieberiana	0.2	500	FG					0.2					
*Sisymbrium orientale**	0.1	10	EX								0.1		
Austrostipa scabra subsp. scabra	0.2	10	GG				0.2						
Vittadinia cuneata var. cuneata	0.1	5	FG					0.1					
*Spergularia rubra**	0.1	10	EX								0.1		
Erodium crinitum	0.1	5	FG					0.1					
*Medicago praecox**	0.5	100	EX								0.5		
*Vulpia myuros**	0.1	10	EX								0.1		

Easting	267757
Northing	6126492
Orientation	275
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	1
20-29	Yes
10-19	Yes
5-9	No
<5	No
Hollows	1
Length logs (m)	11
Attributes 1x1 plot (%)	
Litter (%)	33.4

VNI_DR71

Date	3/09/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR71		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	15		30	22	1	11	2	8	0	0	8	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	80.4	77.2	8	37.5	0.5	31.2	0	0	3.2	0	
Eucalyptus largiflorens	8	6	TG		8								
Atriplex nummularia	10	20	SG			10							
Malacocera tricornis	15	100	SG			15							
*Medicago laciniata**	2	2000	EX								2		
Atriplex lindleyi	20	500	FG					20					
Sclerolaena diacantha	5	50	SG			5							
Einadia nutans	10	100	FG					10					
*Lepidium africanum**	0.2	10	EX								0.2		
Atriplex semibaccata	1	20	SG			1							
Sclerolaena tricuspis	1	20	SG			1							
*Cirsium vulgare**	0.1	5	EX								0.1		
Chenopodium nitrariaceum	1	5	SG			1							
Oxalis perennans	0.7	100	FG					0.7					
Rytidosperma caespitosum	0.4	5	GG				0.4						
*Hordeum leporinum**	0.4	20	EX								0.4		
*Spergularia rubra**	0.1	10	EX								0.1		
Crassula sieberiana	0.1	100	FG					0.1					
*Sisymbrium orientale**	0.1	10	EX								0.1		
*Erodium cicutarium**	0.2	20	EX								0.2		
Erodium crinitum	0.1	5	FG					0.1					
Sclerolaena stelligera	3	80	SG			3							
Enchylaena tomentosa	1	50	SG			1							
Atriplex leptocarpa	0.2	20	SG			0.2							
Brachyscome papillosa	0.1	1	FG					0.1					
Austrostipa scabra subsp. scabra	0.1	5	GG				0.1						
Podolepis capillaris	0.1	5	FG					0.1					
Calandrinia eremaea	0.1	10	FG					0.1					
Osteocarpum acropterum	0.1	5	SG			0.1							
Sclerolaena brachyptera	0.2	10	SG			0.2							
*Sonchus oleraceus**	0.1	5	EX								0.1		

Easting	270323
Northing	6125683
Orientation	240
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	4
20-29	Yes
10-19	No
5-9	No
<5	Yes
Hollows	2
Length logs (m)	63
Attributes 1x1 plot (%)	
Litter (%)	64

VNI_DR72

Date	12/09/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR72		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	15		17	13	1	5	2	4	1	0	4	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	33.1	15.5	3	5.5	1.2	5.6	0.2	0	17.6	0	
Eucalyptus largiflorens	3	1	TG		3								
Chenopodium nitrariaceum	4	10	SG			4							
Sporobolus caroli	0.2	5	GG				0.2						
Rhodanthe corymbiflora	5	400	FG					5					
Marsilea drummondii	0.2	20	EG						0.2				
Crassula sieberiana	0.1	100	FG					0.1					
*Lolium perenne**	15	1000	EX								15		
Sclerolaena muricata var. semiglabra	1	20	SG			1							
Daucus glochidiatus	0.4	200	FG					0.4					
*Vulpia myuros**	0.8	50	EX								0.8		
*Medicago praecox**	0.8	200	EX								0.8		
*Cotula bipinnata**	1	1000	EX								1		
Eleocharis acuta	1	50	GG				1						
Enchylaena tomentosa	0.2	5	SG			0.2							
Sclerolaena stelligera	0.2	20	SG			0.2							
Bulbine bulbosa	0.1	5	FG					0.1					
Atriplex semibaccata	0.1	5	SG			0.1							

Easting	368315
Northing	6121575
Orientation	125
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	1
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	37
Attributes 1x1 plot (%)	
Litter (%)	81

VNI_OZ08

Date	17/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNIOZ_08		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	15		16	10	1	6	0	2	1	0	6	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	76.4	15.2	10	4.8	0	0.3	0.1	0	61.2	0	
Eucalyptus largiflorens	10	3	TG		10								
Nitraria billardierei	2	4	SG			2							
*Lolium perenne**	30	9000	EX								30		
*Hordeum leporinum**	15	1000	EX								15		
Sclerolaena muricata var. semiglabra	2	10	SG			2							
Atriplex leptocarpa	0.5	20	SG			0.5							
Einadia nutans	0.1	2	FG					0.1					
Enchylaena tomentosa	0.1	10	SG			0.1							
*Sisymbrium orientale**	8	800	EX								8		
*Malva parviflora**	0.1	1	EX								0.1		
Marsilea drummondii	0.1	50	EG						0.1				
Rhodanthe corymbiflora	0.2	30	FG					0.2					
*Arctotheca calendula**	0.1	1	EX								0.1		
Duma florulenta	0.1	1	SG			0.1							
*Chenopodium murale**	8	800	EX								8		
Sclerolaena stelligera	0.1	10	SG			0.1							

Easting	370094
Northing	6121853
Orientation	35
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	1
50-79	2
30-49	1
20-29	No
10-19	No
5-9	No
<5	No
Hollows	1
Length logs (m)	25
Attributes 1x1 plot (%)	
Litter (%)	3.2

D2.4 PCT 17 – Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (Moderate_good)

VNI_DR15

Date	4/02/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55	Easting	326393
Plot Name	VNI_DR15		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count		Northing	6112078
PCT	17		20	15	0	4	5	5	1	0	5	0		Orientation	170
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum		Plot size	20 X 20 X 50
Species	Cover	Abundance	50.2	48.8	0	36.6	10.8	0.6	0.8	0	1.4	0		Attributes 20x50m plot	
Duma florulenta	35	50	SG			35								Stem classes	
Enteropogon acicularis	10	50	GG				10							80+	0
Juncus usitatus	0.1	5	GG				0.1							50-79	0
*Lepidium africanum**	1	200	EX								1			30-49	0
*Sonchus oleraceus**	0.1	5	EX								0.1			20-29	No
Sclerolaena stelligera	0.2	20	SG			0.2								10-19	No
Alternanthera nana	0.2	100	FG					0.2						5-9	No
Atriplex leptocarpa	0.4	100	SG			0.4								<5	No
Spergularia brevifolia	0.1	10	FG					0.1						Hollows	0
Marsilea drummondii	0.8	1000	EG						0.8					Length logs (m)	0
Chloris truncata	0.1	10	GG				0.1								
Rytidosperma caespitosum	0.1	10	GG				0.1							Attributes 1x1 plot (%)	
Panicum decompositum	0.5	20	GG				0.5							Litter (%)	0
Oxalis perennans	0.1	10	FG					0.1							
Portulaca oleracea	0.1	1	FG					0.1							
*Conyza bonariensis**	0.1	1	EX								0.1				
*Echium plantagineum**	0.1	5	EX								0.1				
*Avena sp.**	0.1	5	EX								0.1				
Euphorbia drummondii	0.1	20	FG					0.1							
Chenopodium nitrariaceum	1	2	SG			1									

VNI_DR81

Date	17/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55	Easting	365316
Plot Name	VNI_DR81		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count		Northing	6120723
PCT	17		24	14	0	3	6	4	1	0	10	0		Orientation	115
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum		Plot size	20 X 20 X 50
Species	Cover	Abundance	82.8	37	0	28.2	7.8	0.4	0.6	0	45.8	0		Attributes 20x50m plot	
Duma florulenta	25	30	SG			25								Stem classes	
Chenopodium nitrariaceum	3	5	SG			3								80+	N/A
*Vulpia myuros**	20	1000	EX								20			50-79	N/A
*Echium plantagineum**	5	40	EX								5			30-49	N/A
*Trifolium arvense**	3	1000	EX								3			20-29	N/A
*Lolium perenne**	15	1000	EX								15			10-19	N/A
Austrostipa scabra subsp. scabra	5	200	GG				5							5-9	N/A
Rhagodia spinescens	0.2	1	SG			0.2								<5	N/A
Marsilea drummondii	0.6	200	EG						0.6					Hollows	N/A
Rhodanthe corymbiflora	0.1	20	FG					0.1						Length logs (m)	N/A
Eleocharis pusilla	2	200	GG				2								
Juncus flavidus	0.2	5	GG				0.2							Attributes 1x1 plot (%)	
*Trifolium glomeratum**	0.8	40	EX								0.8			Litter (%)	N/A
Rytidosperma caespitosum	0.4	10	GG				0.4								
*Sonchus oleraceus**	0.1	5	EX								0.1				
*Hordeum leporinum**	0.7	20	EX								0.7				
Crassula sieberiana	0.1	20	FG					0.1							
Oxalis perennans	0.1	10	FG					0.1							
Lachnagrostis filiformis	0.1	5	GG				0.1								
*Aira cupaniana**	0.1	1	EX								0.1				
Ranunculus pentandrus var. platycarpu	0.1	5	FG					0.1							
*Medicago laciniata**	1	1000	EX								1				
Walwhalleya proluta	0.1	5	GG				0.1								
*Bromus rubens***	0.1	1	EX								0.1				

VNI_OZ34

Date	29/10/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Plot Name	VNI_OZ34		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
PCT	17		28	23	0	4	6	11	1	1	5	0
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
Species	Cover	Abundance	64.6	51.4	0	47.6	2.5	1.1	0.1	0.1	13.2	0
Duma florulenta	45	50	SG			45						
Chenopodium nitrariaceum	2	5	SG			2						
Sclerolaena muricata	0.5	20	SG			0.5						
Eleocharis spp.	1	1000	GG				1					
Romulea minutiflora	10	10000	EX								10	
Vittadinia cuneata	0.1	10	FG					0.1				
Convolvulus spp.	0.1	5	OG							0.1		
Lolium perenne	1	100	EX								1	
Enteropogon acicularis	1	20	GG				1					
Rumex brownii	0.1	2	FG					0.1				
Alternanthera nana	0.1	5	FG					0.1				
Oxalis perennans	0.1	10	FG					0.1				
Rhodanthe corymbiflora	0.1	10	FG					0.1				
Arctotheca calendula	0.1	20	EX								0.1	
Erodium cicutarium	0.1	10	FG					0.1				
Marselea drummondii	0.1	10	EG						0.1			
Juncus flavidus	0.1	10	GG				0.1					
Medicago laciniata	2	200	EX								2	
Calotis scabiosifolia	0.1	20	FG					0.1				
Rytidosperma setaceum	0.1	5	GG				0.1					
Polygonum plebeium	0.1	2	FG					0.1				
Trifolium arvense	0.1	20	EX								0.1	
Walwhalleya proluta	0.2	5	GG				0.2					
Einadia nutans	0.1	2	FG					0.1				
Salsola australis	0.1	1	SG			0.1						
Goodenia spp.	0.1	1	FG					0.1				
Teucrium racemosum	0.1	2	FG					0.1				
Juncus spp.	0.1	1	GG				0.1					

Easting	-35.06034833
Northing	145.82083
Orientation	210
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

D2.5 PCT 20 – Buloke – Moonah – Black Box open woodland on sandy rises of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (Derived_No Offset)

VNI_DR67

Date	2/09/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55	Easting	268298
Plot Name	VNI_DR67		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count		Northing	6126417
PCT	20		9	3	0	1	0	2	0	0	6	0		Orientation	243
Condition	Derived_No offset		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum		Plot size	20 X 20 X 50
Species	Cover	Abundance	67.5	1.5	0	0.3	0	1.2	0	0	66	0		Attributes 20x50m plot	
*Schismus barbatus**	20	3000	EX								20			Stem classes	
*Echium plantagineum**	20	500	EX								20			80+	0
*Hordeum leporinum**	15	100	EX								15			50-79	0
Erodium crinitum	1	50	FG					1						30-49	0
*Trifolium arvense**	5	2000	EX								5			20-29	No
*Medicago praecox**	5	2000	EX								5			10-19	No
*Vulpia myuros**	1	100	EX								1			5-9	No
Crassula sieberiana	0.2	100	FG					0.2						<5	No
Enchylaena tomentosa	0.3	2	SG			0.3								Hollows	0
														Length logs (m)	0
														Attributes 1x1 plot (%)	
														Litter (%)	0

VNI_DR103

Date	24/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55	Easting	268707
Plot Name	VNI_DR103		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count		Northing	6126358
PCT	20		15	11	0	4	2	5	0	0	4	0		Orientation	166
Condition	Derived_No offset		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum		Plot size	20 X 20 X 50
Species	Cover	Abundance	64.9	22.8	0	1.4	20.4	1	0	0	42.1	0		Attributes 20x50m plot	
Austrostipa scabra subsp. scabra	20	1000	GG				20							Stem classes	
*Medicago laciniata**	25	10000	EX								25			80+	0
*Vulpia myuros**	15	5000	EX								15			50-79	0
*Hordeum leporinum**	2	50	EX								2			30-49	0
Crassula sieberiana	0.2	1000	FG					0.2						20-29	No
Sida corrugata	0.4	20	FG					0.4						10-19	No
Oxalis perennans	0.2	20	FG					0.2						5-9	No
Rytidosperma setaceum	0.4	20	GG				0.4							<5	No
Enchylaena tomentosa	1	10	SG			1								Hollows	0
Sclerolaena muricata var. semiglabra	0.1	5	SG			0.1								Length logs (m)	0
Atriplex semibaccata	0.2	10	SG			0.2									
Spergularia brevifolia	0.1	10	FG					0.1						Attributes 1x1 plot (%)	
Sclerolaena muricata var. villosa	0.1	2	SG			0.1								Litter (%)	0
*Aira cupaniana**	0.1	5	EX								0.1				
Solanum esuriale	0.1	5	FG					0.1							

D2.6 PCT 20 – Buloke – Moonah – Black Box open woodland on sandy rises of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (Thinned)

VNI_DR104

Date	24/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR104		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	20		24	15	1	6	2	5	0	1	9	0	
Condition	Thinned		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	46.8	29.5	5	21.8	1.1	0.6	0	1	17.3	0	
Alectryon oleifolius subsp. canescens	5	2	TG		5								
Atriplex eardleyae	0.4	20	SG			0.4							
Enchylaena tomentosa	10	100	SG			10							
Maireana pyramidata	1	1	SG			1							
Rhagodia spinescens	5	20	SG			5							
Salsola australis	0.4	20	SG			0.4							
Sclerolaena diacantha	5	50	SG			5							
Lysiana exocarpi	1	5	OG							1			
Austrostipa scabra subsp. scabra	1	200	GG				1						
Chloris truncata	0.1	5	GG				0.1						
Crassula sieberiana	0.1	30	FG					0.1					
Einadia nutans subsp. nutans	0.2	10	FG					0.2					
Oxalis perennans	0.1	10	FG					0.1					
Rhodanthe corymbiflora	0.1	1	FG					0.1					
Tetragonia eremaea	0.1	5	FG					0.1					
*Aira cupaniana**	0.1	10	EX								0.1		
*Echium plantagineum**	0.1	5	EX								0.1		
*Hordeum leporinum**	1	30	EX								1		
*Hypochaeris radicata**	0.1	10	EX								0.1		
*Lamarckia aurea**	1	30	EX								1		
*Medicago laciniata**	3	5000	EX								3		
*Schismus barbatus**	2	2000	EX								2		
*Trifolium arvense**	5	10000	EX								5		
*Vulpia myuros**	5	1000	EX								5		

Easting	267190
Northing	6126611
Orientation	105
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	Yes
10-19	No
5-9	No
<5	Yes
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	4

D2.7 PCT 23 – Yarran tall open shrubland of the sandplains and plains of the semi-arid (warm) and arid climate zones (Derived)

VNI_DR65

Date	31/08/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR65		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	23		32	22	1	11	2	8	0	0	10	0	
Condition	Derived		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	54	22.1	0.6	12.3	3.4	5.8	0	0	31.9	0	
Acacia melvillei	0.6	1	TG		0.6								
Sclerolaena muricata var. semiglabra	4	20	SG			4							
*Hordeum leporinum**	25	2000	EX								25		
Rhagodia spinescens	2	10	SG			2							
*Medicago praecox**	2	1000	EX								2		
Austrostipa scabra subsp. scabra	3	100	GG				3						
Oxalis perennans	1	500	FG					1					
Rhodanthe corymbiflora	2	2000	FG					2					
Sclerolaena brachyptera	0.4	10	SG			0.4							
Rhodanthe pygmaea	2	2000	FG					2					
*Cotula bipinnata**	1	1000	EX								1		
*Vulpia myuros**	2	1000	EX								2		
Maireana decalvans	1	10	SG			1							
*Malva parviflora**	0.1	5	EX								0.1		
*Echium plantagineum**	0.1	10	EX								0.1		
Crassula sieberiana	0.2	1000	FG					0.2					
*Medicago laciniata**	1	1000	EX								1		
*Erodium cicutarium**	0.5	30	EX								0.5		
Enteropogon acicularis	0.4	10	GG				0.4						
Calotis hispidula	0.1	10	FG					0.1					
Salsola australis	0.1	5	SG			0.1							
*Lamarckia aurea**	0.1	1	EX								0.1		
Erodium crinitum	0.2	10	FG					0.2					
*Sonchus oleraceus**	0.1	5	EX								0.1		
Maireana pentagona	0.1	10	FG					0.1					
Sclerolaena stelligera	0.1	5	SG			0.1							
Atriplex semibaccata	0.2	10	SG			0.2							
Plantago turrifera	0.2	50	FG					0.2					
Sida intricata	0.5	10	SG			0.5							
Maireana brevifolia	0.6	5	SG			0.6							
Maireana aphylla	3	5	SG			3							
Nitraria billardierei	0.4	1	SG			0.4							

Easting	232660
Northing	6121419
Orientation	60
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	Yes
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_DR105

Date	24/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR105		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	23		14	9	0	5	2	2	0	0	5	0	
Condition	Derived		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	51.2	4.7	0	2	2.2	0.5	0	0	46.5	0	
*Medicago minima**	20	10000	EX								20		
*Hordeum leporinum**	25	5000	EX								25		
Austrostipa scabra subsp. scabra	2	200	GG				2						
Crassula sieberiana	0.1	100	FG					0.1					
Enteropogon acicularis	0.2	10	GG				0.2						
Enchylaena tomentosa	1	10	SG			1							
Atriplex eardleyae	0.3	30	SG			0.3							
Rhagodia spinescens	0.4	1	SG			0.4							
Atriplex semibaccata	0.2	10	SG			0.2							
Salsola australis	0.1	5	SG			0.1							
Cucumis myriocarpus subsp. Leptodermis	0.1	10	EX								0.1		
*Schismus barbatus**	1	100	EX								1		
*Vulpia myuros**	0.4	50	EX								0.4		
Einadia nutans subsp. nutans	0.4	1	FG					0.4					

Easting	266033
Northing	6126889
Orientation	285
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_GL05

Date	24/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_GL05		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	23		15	10	0	6	3	1	0	0	5	0	
Condition	Derived		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	72.7	27.4	0	2	25.2	0.2	0	0	45.3	0	
Austrostipa scabra	25	10000	GG				25						
*Hordeum leporinum**	15	8000	EX								15		
*Vulpia myuros**	10	10000	EX								10		
*Medicago laciniata**	20	10000	EX								20		
Crassula sieberiana	0.2	200	FG					0.2					
*Medicago minima**	0.1	200	EX								0.1		
Sclerolaena muricata var. semiglabra	1	5	SG			1							
Enchylaena tomentosa	0.5	2	SG			0.5							
Chloris truncata	0.1	1	GG				0.1						
*Marrubium vulgare**	0.2	20	EX								0.2		
Rytidosperma caespitosum	0.1	5	GG				0.1						
Atriplex eardleyae	0.1	5	SG			0.1							
Atriplex leptocarpa	0.1	1	SG			0.1							
Salsola australis	0.1	1	SG			0.1							
Rhagodia spinescens	0.2	1	SG			0.2							

Easting	266516
Northing	6126781
Orientation	137
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_GL06

Date	24/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_GL06		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	23		22	14	0	8	3	3	0	0	8	0	
Condition	Derived		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	50.1	14.4	0	10.8	3.2	0.4	0	0	35.7	0	
*Medicago laciniata**	15	15000	EX								15		
*Vulpia myuros**	5	5000	EX								5		
*Hordeum leporinum**	15	5000	EX								15		
Rhagodia spinescens	10	30	SG			10							
Crassula sieberiana	0.2	500	FG					0.2					
Atriplex eardleyae	0.1	5	SG			0.1							
*Medicago minima**	0.2	200	EX								0.2		
*Emex australis**	0.1	2	EX								0.1		
Austrostipa scabra	3	500	GG				3						
Sida intricata	0.1	1	SG			0.1							
Sclerolaena muricata var. villosa	0.1	1	SG			0.1							
Daucus glochidiatus	0.1	3	FG					0.1					
Maireana pyramidata	0.1	1	SG			0.1							
Salsola australis	0.1	5	SG			0.1							
*Schismus barbatus**	0.2	100	EX								0.2		
Juncus flavidus	0.1	5	GG				0.1						
Sida corrugata	0.1	1	FG					0.1					
Sclerolaena muricata var. semiglabra	0.1	1	SG			0.1							
Sporobolus caroli	0.1	2	GG				0.1						
*Echium plantagineum**	0.1	1	EX								0.1		
Enchylaena tomentosa	0.2	1	SG			0.2							
Cucumis myriocarpus subsp myriocarpus	0.1	1	EX								0.1		

Easting	265671
Northing	6126947
Orientation	43
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNIOZ_16

Date	24/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNIOZ_16		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	23		26	20	0	4	2	14	0	0	6	0	
Condition	Derived		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	64.3	50.8	0	8.2	40.1	2.5	0	0	13.5	0	
Rytidosperma caespitosum	40	10000	GG				40						
Podolepis muelleri	1	1000	FG					1					
*Medicago laciniata**	3	3000	EX								3		
Crassula sieberiana	0.1	200	FG					0.1					
Maireana pentagona	0.2	200	FG					0.2					
*Vulpia myuros**	10	5000	EX								10		
Rhodanthe pygmaea	0.1	200	FG					0.1					
*Medicago minima**	0.1	50	EX								0.1		
Enchylaena tomentosa	5	20	SG			5							
Maireana aphylla	3	5	SG			3							
Sida intricata	0.1	1	SG			0.1							
*Hordeum leporinum**	0.1	100	EX								0.1		
Triptilodiscus pygmaeus	0.1	500	FG					0.1					
Goodenia spp.	0.1	5	FG					0.1					
Plantago turrifera	0.1	50	FG					0.1					
Calotis hispidula	0.1	20	FG					0.1					
Myriocephalus rhizocephalus	0.1	100	FG					0.1					
Spergularia brevifolia	0.2	100	FG					0.2					
*Cotula bipinnata**	0.1	1	EX								0.1		
*Limonium lobatum**	0.2	50	EX								0.2		
Sclerolaena diacantha	0.1	1	SG			0.1							
Austrostipa scabra	0.1	10	GG				0.1						
Ptilotus spathulatus f. spathulatus	0.1	2	FG					0.1					
Solanum esuriale	0.1	10	FG					0.1					
Sida trichopoda	0.1	1	FG					0.1					
Rhodanthe corymbiflora	0.1	2	FG					0.1					

Easting	269426
Northing	6126239
Orientation	202
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNIOZ_17

Date	24/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNIOZ_17		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	23		33	27	0	8	4	15	0	0	6	1	
Condition	Derived		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	63.3	54.6	0	11.5	40.2	2.9	0	0	8.7	1	
Austrostipa scabra	30	1000	GG				30						
Rytidosperma caespitosum	10	700	GG				10						
Maireana aphylla	3	10	SG			3							
Rhagodia spinescens	5	10	SG			5							
*Lolium perenne**	2	200	EX								2		
Juncus flavidus	0.1	3	GG				0.1						
Oxalis perennans	0.1	5	FG					0.1					
*Medicago laciniata**	0.5	500	EX								0.5		
Sida trichopoda	0.1	1	FG					0.1					
Crassula sieberiana	0.1	1000	FG					0.1					
Plantago turrifera	0.1	20	FG					0.1					
Rhodanthe pygmaea	0.1	100	FG					0.1					
Enchylaena tomentosa	2	20	SG			2							
Eriochlamys squamata	1	200	FG					1					
Enteropogon acicularis	0.1	1	GG				0.1						
Calotis hispidula	0.1	20	FG					0.1					
Goodenia spp.	0.1	50	FG					0.1					
*Vulpia myuros**	5	5000	EX								5		
*Lycium ferocissimum**	1	2	HT									1	
*Medicago minima**	0.1	50	EX								0.1		
Podolepis muelleri	0.5	500	FG					0.5					
*Hordeum leporinum**	0.1	100	EX								0.1		
Solanum esuriale	0.1	10	FG					0.1					
Nitraria billardierei	1	1	SG			1							
Atriplex eardleyae	0.2	5	SG			0.2							
Maireana pentagona	0.2	100	FG					0.2					
Salsola australis	0.1	5	SG			0.1							
Rhodanthe corymbiflora	0.1	3	FG					0.1					
Plantago cunninghamii	0.1	1	FG					0.1					
Atriplex leptocarpa	0.1	3	SG			0.1							
Vittadinia cuneata	0.1	1	FG					0.1					
Sida corrugata	0.1	1	FG					0.1					
Sclerolaena muricata var. semiglabra	0.1	1	SG			0.1							

Easting	268808
Northing	6126464
Orientation	62
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

D2.8 PCT 23 – Yarran tall open shrubland of the sandplains and plains of the semi-arid (warm) and arid climate zones (Moderate_good)

VNI_DR101

Date	24/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR101		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	23		34	30	1	14	5	10	0	0	4	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	63.4	59.2	3	32.3	21.6	2.3	0	0	4.2	0	
Acacia melvillei	3	3	TG		3								
Rhagodia spinescens	15	30	SG			15							
Austrostipa scabra subsp. scabra	15	1000	GG				15						
Sclerolaena muricata var. semiglabra	1	30	SG			1							
Enchylaena tomentosa	10	100	SG			10							
*Medicago praecox**	3	2000	EX								3		
Einadia nutans subsp. nutans	1	40	FG					1					
Atriplex semibaccata	1	30	SG			1							
*Vulpia myuros**	1	500	EX								1		
Oxalis perennans	0.4	40	FG					0.4					
Enteropogon acicularis	0.5	20	GG				0.5						
Spergularia brevifolia	0.2	40	FG					0.2					
Crassula sieberiana	0.1	10	FG					0.1					
Sclerolaena diacantha	0.7	20	SG			0.7							
Rytidosperma setaceum	5	200	GG				5						
Teucrium racemosum	0.1	20	FG					0.1					
Sida trichopoda	0.1	10	FG					0.1					
Vittadinia gracilis	0.1	5	FG					0.1					
Juncus flavidus	0.1	20	GG				0.1						
Maireana aphylla	0.8	5	SG			0.8							
Alternanthera nana	0.1	10	FG					0.1					
Salsola australis	0.1	10	SG			0.1							
Sclerolaena muricata var. villosa	1	20	SG			1							
Atriplex eardleyae	0.4	20	SG			0.4							
Solanum esuriale	0.1	20	FG					0.1					
Nitraria billardierei	1	1	SG			1							
Euphorbia drummondii	0.1	5	FG					0.1					
*Lepidium africanum**	0.1	10	EX								0.1		
Atriplex leptocarpa	0.1	5	SG			0.1							
Sporobolus caroli	1	20	GG				1						
Sclerolaena stelligera	0.1	5	SG			0.1							
*Lolium perenne**	0.1	10	EX								0.1		
Maireana pyramidata	1	1	SG			1							
Sida intricata	0.1	5	SG			0.1							

Easting	269222
Northing	6126330
Orientation	37
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	Yes
10-19	Yes
5-9	No
<5	No
Hollows	0
Length logs (m)	8
Attributes 1x1 plot (%)	
Litter (%)	24

VNI_DR102

Date	24/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR102		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	23		27	20	1	10	2	7	0	0	7	1	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	49.9	41.6	10	20.2	5.7	5.7	0	0	8.3	1	
Acacia melvillei	10	10	TG		10								
Enchylaena tomentosa	15	50	SG			15							
Maireana pyramidata	1	3	SG			1							
Einadia nutans subsp. nutans	5	60	FG					5					
*Lycium ferocissimum**	1	2	HT									1	
Austrostipa scabra subsp. scabra	5	400	GG				5						
*Schismus barbatus**	4	1000	EX								4		
Salsola australis	0.2	20	SG			0.2							
Sida corrugata	0.1	10	FG					0.1					
*Medicago laciniata**	0.8	400	EX								0.8		
Sclerolaena muricata var. villosa	0.6	20	SG			0.6							
*Hordeum leporinum**	0.4	30	EX								0.4		
Oxalis perennans	0.2	40	FG					0.2					
Rytidosperma setaceum	0.7	50	GG				0.7						
Sclerolaena diacantha	1	30	SG			1							
Crassula sieberiana	0.1	10	FG					0.1					
Solanum esuriale	0.1	5	FG					0.1					
Tetragonia eremaea	0.1	10	FG					0.1					
*Lamarckia aurea**	0.1	20	EX								0.1		
Maireana aphylla	1	5	SG			1							
Spergularia brevifolia	0.1	20	FG					0.1					
Atriplex eardleyae	0.2	30	SG			0.2							
*Vulpia myuros**	1	500	EX								1		
Atriplex vesicaria	0.1	1	SG			0.1							
Rhagodia spinescens	1	2	SG			1							
*Sisymbrium orientale**	1	30	EX								1		
Malacocera tricornis	0.1	5	SG			0.1							

Easting	268926
Northing	6126358
Orientation	185
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	1
20-29	Yes
10-19	Yes
5-9	Yes
<5	No
Hollows	0
Length logs (m)	26
Attributes 1x1 plot (%)	
Litter (%)	21

VNIOZ_18

Date	24/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNIOZ_18		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	23		25	21	1	13	2	5	0	0	4	1	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	62.1	61.6	10	50.8	0.2	0.6	0	0	0.5	0.2	
Acacia melvillei	10	4	TG		10								
Rhagodia spinescens	40	50	SG			40							
Rytidosperma caespitosum	0.1	50	GG				0.1						
Austrostipa scabra	0.1	20	GG				0.1						
Atriplex nummularia	0.5	1	SG			0.5							
Enchylaena tomentosa	5	30	SG			5							
Sclerolaena diacantha	2	40	SG			2							
Maireana pentagona	0.1	100	FG					0.1					
Einadia nutans	0.2	20	FG					0.2					
*Lycium ferocissimum**	0.2	1	HT									0.2	
Salsola australis	0.1	3	SG			0.1							
*Lamarckia aurea**	0.1	50	EX								0.1		
*Hordeum leporinum**	0.1	10	EX								0.1		
Crassula sieberiana	0.1	100	FG					0.1					
Spergularia brevifolia	0.1	5	FG					0.1					
Atriplex leptocarpa	2	20	SG			2							
Sclerolaena brachyptera	0.2	20	SG			0.2							
Atriplex semibaccata	0.2	20	SG			0.2							
Atriplex spp.	0.1	1	SG			0.1							
Osteocarpum acropterum var. acropterum	0.1	20	SG			0.1							
Oxalis perennans	0.1	1	FG					0.1					
Atriplex eardleyae	0.2	20	SG			0.2							
Maireana aphylla	0.2	1	SG			0.2							
*Schismus barbatus**	0.1	1	EX								0.1		
Sclerolaena muricata var. semiglabra	0.2	2	SG			0.2							

Easting	266851
Northing	6126696
Orientation	115
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	3
20-29	Yes
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	15
Attributes 1x1 plot (%)	
Litter (%)	18

D2.9 PCT 24 – Canegrass swamp tall grassland wetland of drainage depressions, lakes and pans of the inland plains (Moderate_good)

VNI_DR36

Date	4/05/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR36		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	24		10	10	0	4	4	1	1	0	0	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	72.4	72.4	0	5.4	56.4	0.6	10	0	0	0	
Eragrostis australasica	55	50	GG				55						
Chenopodium nitrariaceum	3	2	SG			3							
Marsilea drummondii	10	1000	EG						10				
Enteropogon acicularis	1	20	GG				1						
Duma florulenta	1	5	SG			1							
Nitraria billardierei	1	1	SG			1							
Einadia nutans	0.6	5	FG					0.6					
Sclerolaena muricata var. semiglabra	0.4	2	SG			0.4							
Juncus flavidus	0.1	5	GG				0.1						
Lachnagrostis filiformis	0.3	10	GG				0.3						

Easting	301854
Northing	6113670
Orientation	150
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

VNI_DR90

Date	20/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR90		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	24		21	17	0	3	6	8	0	0	4	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	35.5	34.2	0	11.1	20.9	2.2	0	0	1.3	0	
Eragrostis australasica	15	60	GG				15						
Maireana aphylla	10	50	SG			10							
Rytidosperma caespitosum	5	100	GG				5						
*Lolium perenne**	1	1000	EX								1		
Calocephalus sonderi	1	1000	FG					1					
Cressa australis	0.4	500	FG					0.4					
Brachyscome lineariloba	0.1	50	FG					0.1					
Goodenia pinnatifida	0.2	100	FG					0.2					
Eleocharis obicis	0.5	20	GG				0.5						
Rhodanthe corymbiflora	0.2	200	FG					0.2					
Plantago turrifera	0.1	30	FG					0.1					
Juncus flavidus	0.1	2	GG				0.1						
Maireana pentagona	0.1	20	FG					0.1					
*Sonchus oleraceus**	0.1	5	EX								0.1		
*Spergularia rubra**	0.1	5	EX								0.1		
Einadia nutans	0.1	5	FG					0.1					
Chloris truncata	0.1	10	GG				0.1						
Sclerolaena muricata var. semiglabra	0.1	5	SG			0.1							
Nitraria billardierei	1	1	SG			1							
*Medicago praecox**	0.1	20	EX								0.1		
Enteropogon acicularis	0.2	5	GG				0.2						

Easting	289033
Northing	6115617
Orientation	300
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

VNI_DR98

Date	22/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR98		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	24		50	42	0	6	13	22	1	0	8	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	68.7	55.2	0	9.2	31.9	13.6	0.5	0	13.5	0	
Eragrostis australasica	20	50	GG				20						
Maireana aphylla	5	20	SG			5							
Leiocarpa leptolepis	5	100	FG					5					
Rytidosperma caespitosum	5	300	GG				5						
*Lolium perenne**	5	1000	EX								5		
Rhodanthe corymbiflora	0.5	100	FG					0.5					
Calotis scabiosifolia var. scabiosifolia	4	200	FG					4					
Calocephalus sonderi	0.4	500	FG					0.4					
*Medicago sp.**	2	2000	EX								2		
Oxalis perennans	0.5	300	FG					0.5					
*Vulpia myuros**	5	2000	EX								5		
Plantago turrifera	0.2	50	FG					0.2					
Solanum esuriale	0.1	10	FG					0.1					
Tricoryne elatior	0.1	10	FG					0.1					
*Sonchus oleraceus**	0.1	10	EX								0.1		
Brachyscome lineariloba	0.2	50	FG					0.2					
Vittadinia cuneata	0.2	20	FG					0.2					
Alternanthera nana	0.1	20	FG					0.1					
Enteropogon acicularis	1	20	GG				1						
Einadia nutans	1	20	FG					1					
Nitraria billardierei	2	1	SG			2							
Lachnagrostis filiformis	0.1	10	GG				0.1						
Chenopodium nitrariaceum	1	1	SG			1							
Myriocephalus rhizocephalus	0.2	50	FG					0.2					
Marsilea drummondii	0.5	500	EG						0.5				
Daucus glochidiatus	0.1	50	FG					0.1					
Juncus flavidus	0.4	20	GG				0.4						
Eleocharis pusilla	1	100	GG				1						
Rytidosperma setaceum	1	40	GG				1						
Pycnosorus globosus	0.1	5	FG					0.1					
Senecio runcinifolius	0.3	20	FG					0.3					
*Hypochaeris radicata**	0.1	10	EX								0.1		
Walwhalleya proluta	1	20	GG				1						
*Bromus hordeaceus**	0.2	10	EX								0.2		
*Avena sp.**	0.1	10	GG				0.1						
*Phalaris paradoxa**	0.1	10	EX								0.1		
Chloris truncata	1	20	GG				1						
*Hordeum leporinum**	1	30	EX								1		
Eragrostis dielsii	1	20	GG				1						
Eleocharis obicis	0.1	10	GG				0.1						
Austrostipa scabra subsp. scabra	0.2	10	GG				0.2						
Goodenia fascicularis	0.1	20	FG					0.1					
Duma florulenta	1	5	SG			1							
Teucrium racemosum	0.1	20	FG					0.1					
Haloragis glauca f. glauca	0.1	10	FG					0.1					
Asperula conferta	0.1	20	FG					0.1					
Crassula sieberiana	0.1	20	FG					0.1					
Sclerolaena muricata var. semiglabra	0.1	5	SG			0.1							
Sclerolaena stelligera	0.1	5	SG			0.1							
Podolepis muelleri	0.1	5	FG					0.1					

Easting	297242
Northing	6114114
Orientation	58
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

VNIOZ_03

Date	30/08/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNIOZ_03		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	24		17	13	0	1	2	9	1	0	4	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	54.7	48.5	0	15	30	3.4	0.1	0	6.2	0	
Eragrostis australasica	20	50	GG				20						
Rytidosperma caespitosum	10	200	GG				10						
Maireana aphylla	15	50	SG			15							
*Lolium perenne**	5	1000	EX								5		
Rhodanthe corymbiflora	2	1000	FG					2					
*Medicago sp.**	1	1000	EX								1		
*Erodium cicutarium**	0.1	100	EX								0.1		
Marsilea drummondii	0.1	200	EG						0.1				
Plantago turrifera	0.2	200	FG					0.2					
*Sonchus oleraceus**	0.1	20	EX								0.1		
Ranunculus pentandrus	0.5	200	FG					0.5					
Crassula sieberiana	0.1	500	FG					0.1					
Goodenia spp.	0.1	10	FG					0.1					
Cotula australis	0.2	200	FG					0.2					
Oxalis perennans	0.1	500	FG					0.1					
Swainsona procumbens	0.1	1	FG					0.1					
Brachyscome lineariloba	0.1	100	FG					0.1					

Easting	288578
Northing	6115650
Orientation	150
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

VNIOZ_13

Date	22/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNIOZ_13		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	24		17	12	0	1	6	4	1	0	5	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	84.5	59	0	3	55.4	0.4	0.2	0	25.5	0	
Eragrostis australasica	30	50	GG				30						
Chenopodium nitrariaceum	3	1	SG			3							
Eleocharis plana	25	10000	GG				25						
Marsilea drummondii	0.2	1000	EG						0.2				
*Lolium perenne**	25	10000	EX								25		
*Phalaris paradoxa**	0.2	200	EX								0.2		
Cressa australis	0.1	3	FG					0.1					
Amphibromus neesii	0.1	1	GG				0.1						
*Vulpia myuros**	0.1	100	EX								0.1		
Juncus spp.	0.1	1	GG				0.1						
Rhodanthe corymbiflora	0.1	10	FG					0.1					
Walwhalleya proluta	0.1	1	GG				0.1						
*Medicago laciniata**	0.1	10	EX								0.1		
Rytidosperma caespitosum	0.1	3	GG				0.1						
Rumex brownii	0.1	3	FG					0.1					
*Romulea minutiflora**	0.1	5	EX								0.1		
Stellaria angustifolia	0.1	1	FG					0.1					

Easting	301051
Northing	6113751
Orientation	135
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

D2.10 PCT 26 – Weeping Myall open woodland of the Riverina Bioregion and NSW Southwestern Slopes Bioregion (Derived)

VNI_DR01

Date	28/11/2023		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Plot Name	VNI_DR01		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
PCT	26		25	22	0	7	8	7	0	0	3	0
Condition	Derived		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
Species	Cover	Abundance	76.9	75.9	0	2.8	71.5	1.6	0	0	1	0
Enteropogon acicularis	30	500	GG				30					
Rytidosperma caespitosum	15	500	GG				15					
*Lolium perenne**	0.5	20	EX								0.5	
Maireana pentagona	0.5	100	FG					0.5				
*Medicago laciniata**	0.4	100	EX								0.4	
Crassula sieberiana	0.1	10	FG					0.1				
Chloris truncata	10	500	GG				10					
Maireana excavata	0.8	20	SG			0.8						
Panicum decompositum	0.2	10	GG				0.2					
Salsola australis	0.1	20	SG			0.1						
Austrostipa scabra s ubsp. scabra	15	500	GG				15					
*Avena barbata**	0.1	10	EX								0.1	
Ptilotus spathulatus	0.4	30	FG					0.4				
Atriplex semibaccata	1	20	SG			1						
Vittadinia gracilis	0.1	10	FG					0.1				
Enchylaena tomentosa	0.2	20	SG			0.2						
Sida trichopoda	0.1	10	FG					0.1				
Maireana decalvans	0.1	10	SG			0.1						
Sclerolaena muricata var. semiglabra	0.5	2	SG			0.5						
Leiocarpa websteri	0.1	10	FG					0.1				
Juncus flavidus	0.1	2	GG				0.1					
Sporobolus caroli	0.2	20	GG				0.2					
Rytidosperma setaceum	1	20	GG				1					
Leucochrysum molle	0.3	40	FG					0.3				
Maireana aphylla	0.1	1	SG			0.1						

55

Easting	300103
Northing	6113777
Orientation	150
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	8

VNI_DR05

Date	31/01/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Plot Name	VNI_DR05		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
PCT	26		21	21	1	5	7	8	0	0	0	0
Condition	Derived		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
Species	Cover	Abundance	62.8	62.8	1	2.7	58	1.1	0	0	0	0
Acacia pendula	1	1	TG		1							
Enteropogon acicularis	20	200	GG				20					
Austrostipa scabra subsp. scabra	15	200	GG				15					
Rytidosperma caespitosum	5	100	GG				5					
Sporobolus caroli	15	200	GG				15					
Sida trichopoda	0.2	50	FG					0.2				
Salsola australis	0.5	50	SG			0.5						
Atriplex semibaccata	1	10	SG			1						
Sclerolaena diacantha	0.6	50	SG			0.6						
Rytidosperma setaceum	1	100	GG				1					
Goodenia fascicularis	0.2	30	FG					0.2				
Chloris truncata	1	50	GG				1					
Solanum esuriale	0.1	10	FG					0.1				
Maireana decalvans	0.4	5	SG			0.4						
Panicum decompositum	1	50	GG				1					
Sclerolaena muricata var. semiglabr	0.2	2	SG			0.2						
Vittadinia cuneata	0.1	5	FG					0.1				
Oxalis perennans	0.1	5	FG					0.1				
Sida corrugata	0.1	5	FG					0.1				
Leiocarpa websteri	0.2	1	FG					0.2				
Euphorbia drummondii	0.1	5	FG					0.1				

55

Easting	370125
Northing	6122584
Orientation	260
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	0
10-19	no
5-9	no
<5	yes
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	1

VNI_DR28

Date	2/05/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Plot Name	VNI_DR28		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
PCT	26		18	17	0	4	6	7	0	0	1	0
Condition	Derived		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
Species	Cover	Abundance	44.5	44.2	0	10.4	31.2	2.6	0	0	0.3	0
Walwhalleya proluta	15	500	GG				15					
Maireana aphylla	10	50	SG			10						
Chloris truncata	0.2	20	GG				0.2					
Rytidosperma caespitosum	10	500	GG				10					
Enteropogon acicularis	5	80	GG				5					
*Medicago laciniata**	0.3	2000	EX								0.3	
Sida corrugata	0.1	10	FG					0.1				
Maireana pentagona	0.1	10	FG					0.1				
Sida trichopoda	0.1	10	FG					0.1				
Solanum esuriale	0.1	10	FG					0.1				
Sclerolaena diacantha	0.1	1	SG			0.1						
Calotis scabiosifolia var. scabiosifolia	0.1	5	FG					0.1				
Leiocarpa panaetioides	2	30	FG					2				
Atriplex semibaccata	0.2	1	SG			0.2						
Austrostipa scabra subsp. scabra	0.4	20	GG				0.4					
Sclerolaena muricata var. semiglabra	0.1	1	SG			0.1						
Oxalis perennans	0.1	50	FG					0.1				
Sporobolus caroli	0.6	20	GG				0.6					

55

Easting	360894
Northing	6119109
Orientation	80
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	no
10-19	no
5-9	no
<5	no
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_DR57

Date	28/08/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR57		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	26		33	25	0	4	4	17	0	0	8	0	
Condition	Derived		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	62.7	55.1	0	2.1	48	5	0	0	7.6	0	
Sporobolus caroli	30	800	GG				30						
Enteropogon acicularis	5	200	GG				5						
Austrostipa aristiglumis	10	200	GG				10						
Austrostipa scabra subsp. scabra	3	100	GG				3						
*Medicago laciniata**	1	1000	EX								1		
Rhodanthe corymbiflora	2	500	FG					2					
*Cotula bipinnata**	1	100	EX								1		
Maireana excavata	0.5	50	SG			0.5							
Maireana humillima	0.5	50	SG			0.5							
Erodium crinitum	0.1	100	FG					0.1					
Crassula sieberiana	0.1	200	FG					0.1					
Goodenia pusilliflora	0.1	10	FG					0.1					
*Lolium perenne**	2	200	EX								2		
Chrysocephalum apiculatum	1	50	FG					1					
Oxalis perennans	0.1	200	FG					0.1					
Calotis scabiosifolia var. scabiosifolia	0.2	100	FG					0.2					
Wurmbea dioica subsp. dioica	0.1	50	FG					0.1					
Sida corrugata	0.1	20	FG					0.1					
Ptilotus seminudus	0.1	5	FG					0.1					
*Erodium cicutarium**	0.1	10	EX								0.1		
*Arctotheca calendula**	3	200	EX								3		
Tricoryne elatior	0.1	20	FG					0.1					
Teucrium racemosum	0.1	20	FG					0.1					
Vittadinia cuneata var. cuneata	0.5	10	FG					0.5					
*Erodium botrys**	0.1	20	EX								0.1		
Isoetopsis graminifolia	0.1	10	FG					0.1					
*Sonchus oleraceus**	0.3	50	EX								0.3		
Vittadinia cuneata var. hirsuta	0.1	10	FG					0.1					
Salsola tragus	0.1	20	SG			0.1							
Ptilotus spathulatus f. spathulatus	0.1	5	FG					0.1					
*Echium plantagineum**	0.1	10	EX								0.1		
Sclerolaena muricata var. semiglabra	1	3	SG			1							
Asperula scoparia	0.1	5	FG					0.1					

Easting	382000
Northing	6124183
Orientation	60
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	6
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_DR119

Date	9/04/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR119		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	26		21	20	1	4	5	10	0	0	1	0	
Condition	Derived		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	24.8	24.6	0.1	0.5	22.8	1.2	0	0	0.2	0	
Acacia pendula	0.1	1	TG		0.1								
Enteropogon acicularis	5	70	GG				5						
Austrostipa scabra subsp. scabra	2	50	GG				2						
*Medicago spp.**	0.2	1000	EX								0.2		
Erodium crinitum	0.1	30	FG					0.1					
Maireana pentagona	0.2	1000	FG					0.2					
Goodenia heteromera	0.1	20	FG					0.1					
Teucrium racemosum	0.1	30	FG					0.1					
Walwhalleya proluta	10	100	GG				10						
Goodenia fascicularis	0.1	20	FG					0.1					
Euphorbia drummondii	0.1	30	FG					0.1					
Maireana decalvans	0.1	5	SG			0.1							
Sida corrugata	0.2	30	FG					0.2					
Maireana aphylla	0.2	3	SG			0.2							
Salsola australis	0.1	5	SG			0.1							
Rytidosperma caespitosum	5	100	GG				5						
Solanum esuriale	0.1	10	FG					0.1					
Sida trichopoda	0.1	20	FG					0.1					
Chloris truncata	0.8	30	GG				0.8						
Sclerolaena muricata var. semiglabra	0.1	1	SG			0.1							
Leiocarpa spp.	0.1	1	FG					0.1					

Easting	378606
Northing	6124136
Orientation	80
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	Yes
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	7

VNI_MP02

Date	28/08/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_MP02		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	26		19	12	0	1	2	9	0	0	7	1	
Condition	Derived		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	20.95	13.65	0	0.15	5.1	8.4	0	0	7.3	1	
*Arctotheca calendula**	0.1	1	EX								0.1		
*Medicago praecox**	2	100	EX								2		
Enterpogon acicularis	5	100	GG				5						
Tricoryne elatior	1	20	FG					1					
Pseudognaphalium luteoalbum	2	200	FG					2					
*Lolium rigidum**	3	100	EX								3		
Erodium crinitum	3	100	FG					3					
*Erodium sp.**	0.1	5	EX								0.1		
Asperula conferta	1	5	FG					1					
Romulea rosea	1	1	HT									1	
Oxalis perennans	0.1	0.1	FG					0.1					
Leucochrysum molle	1	25	FG					1					
Maireana brevifolia	0.15	1	SG			0.15							
Crassula colorata	0.1	5	FG					0.1					
*Hordeum leporinum**	1	1	EX								1		
Goodenia pinnatifida	0.1	2	FG					0.1					
*Vulpia myuros**	0.1	1	EX								0.1		
Walwhalleya proluta	0.1	1	GG				0.1						
Swainsona phacoides	0.1	1	FG					0.1					

Easting	376517
Northing	6123085
Orientation	202
Plot size	20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	1

VNI_MP20

Date	10/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_MP20		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	26		12	5	0	2	2	1	0	0	7	1	
Condition	Derived		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	76	7.7	0	5.5	2.1	0.1	0	0	68.3	0.1	
Atriplex nummularia (planted)	5	3	SG			5							
Sclerolaena muricata	0.5	10	SG			0.5							
*Lolium rigidum**	60	250	EX								60		
Rytidosperma caespitosum	2	100	GG				2						
*Avena fatua**	0.1	20	EX								0.1		
*Medicago praecox**	6	200	EX								6		
*Hordeum leporinum**	1	100	EX								1		
Rhodanthe corymbiflora	0.1	20	FG					0.1					
Chloris truncata	0.1	1	GG				0.1						
*Echium plantagineum**	0.1	1	EX								0.1		
*Vulpia myuros**	1	100	EX								1		
*Romulea rosea**	0.1	5	HT									0.1	

Easting	358656
Northing	6118456
Orientation	195
Plot size	20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_MP21

Date	10/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_MP21		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	26		16	11	0	4	4	3	0	0	5	0	
Condition	Derived		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	66.2	27.1	0	3.2	23.6	0.3	0	0	39.1	0	
Austrostipa scabra	15	100	GG				15						
Maireana aphylla	1	5	SG			1							
Enteropogon acicularis	0.5	10	GG				0.5						
*Lolium rigidum**	5	100	EX								5		
Rytidosperma caespitosum	8	100	GG				8						
*Arctotheca calendula**	1	10	EX								1		
Maireana ciliata	0.1	10	FG					0.1					
Sclerolaena muricata	2	15	SG			2							
*Trifolium angustifolium**	0.1	10	EX								0.1		
Rhodanthe corymbiflora	0.1	1	FG					0.1					
*Hordeum leporinum**	3	50	EX								3		
Atriplex semibaccata	0.1	5	SG			0.1							
Vittadinia cuneata	0.1	5	FG					0.1					
Mariana brevifolia	0.1	1	SG			0.1							
*Medicago praecox**	30	100	EX								30		
Chloris truncata	0.1	1	GG				0.1						

Easting	358775
Northing	6118594
Orientation	150
Plot size	20x50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_OZ32

Date	28/10/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Plot Name	VNI_OZ32		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
PCT	26		25	21	1	5	5	9	0	1	4	0
Condition	Derived		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
Species	Cover	Abundance	56.5	15.9	0.2	5.6	7.8	2.2	0	0.1	40.6	0
Austrostipa aristiglumis	5	100	GG				5					
Acacia pendula	0.2	1	TG		0.2							
Sclerolaena muricata	5	10	SG			5						
Lolium perenne	25	5000	EX								25	
Enteropogon acicularis	2	10	GG				2					
Medicago laciniata	15	5000	EX								15	
Rhodanthe corymbiflora	1	100	FG					1				
Alternanthera nana	0.1	2	FG					0.1				
Maireana excavata	0.1	5	SG			0.1						
Maireana decalvans	0.2	20	SG			0.2						
Hordeum leporinum	0.5	50	EX								0.5	
Vittadinia cuneata	0.1	5	FG					0.1				
Maireana enchylaenoides	0.5	20	FG					0.5				
Maireana pentagona	0.1	5	SG			0.1						
Avena barbata	0.1	5	EX								0.1	
Convolvulus spp.	0.1	5	OG							0.1		
Sclerolaena diacantha	0.2	20	SG			0.2						
Rytidosperma caespitosum	0.5	50	GG				0.5					
Ptilotus exaltatus var. semilanatus	0.1	5	FG					0.1				
Juncus flavidus	0.1	1	GG				0.1					
Oxalis perennans	0.1	1	FG					0.1				
Austrostipa scabra subsp. scabra	0.2	20	GG				0.2					
Euphorbia drummondii	0.1	5	FG					0.1				
Sida trichopoda	0.1	3	FG					0.1				
Zaleya spp.	0.1	3	FG					0.1				

Easting	-35.05818333
Northing	145.80523
Orientation	132
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	Yes
Hollows	0
Length logs (m)	2
Attributes 1x1 plot (%)	
Litter (%)	2.2

D2.11 PCT 26 – Weeping Myall open woodland of the Riverina Bioregion and NSW Southwestern Slopes Bioregion (Moderate_good)

VNI_DR02

Date	28/11/2023		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR02		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	26		24	21	1	7	7	6	0	0	3	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	49.2	48.1	5	6.5	35.7	0.9	0	0	1.1	0	
Acacia pendula	5	2	TG		5								
Rhagodia spinescens	1	10	SG			1							
Atriplex semibaccata	3	20	SG			3							
Rytidosperma setaceum	0.4	30	GG				0.4						
Salsola australis	0.3	20	SG			0.3							
Maireana excavata	0.8	30	SG			0.8							
*Lolium perenne**	0.4	30	EX								0.4		
Sida trichopoda	0.1	10	FG					0.1					
Maireana pentagona	0.2	30	FG					0.2					
Austrostipa scabra subsp. *scabra*	15	500	GG				15						
*Medicago laciniata**	0.6	100	EX								0.6		
Enteropogon acicularis	15	500	GG				15						
Chloris truncata	1	50	GG				1						
Chrysocephalum apiculatum	0.3	20	FG					0.3					
Enchylaena tomentosa	0.1	10	SG			0.1							
Maireana decalvans	0.3	20	SG			0.3							
Maireana enchylaenoides	0.1	30	FG					0.1					
Panicum decompositum	1	20	GG				1						
Vittadinia gracilis	0.1	10	FG					0.1					
Sporobolus caroli	0.3	30	GG				0.3						
Sclerolaena muricata var. *semiglabra*	1	2	SG			1							
*Avena sp.**	0.1	2	EX								0.1		
Rytidosperma caespitosum	3	100	GG				3						
Ptilotus spathulatus	0.1	10	FG					0.1					

Easting	376139
Northing	6123574
Orientation	190
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	Yes
10-19	Yes
5-9	No
<5	Yes
Hollows	0
Length logs (m)	10
Attributes 1x1 plot (%)	
Litter (%)	19

VNI_DR07

Date	31/01/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThrea	55
Plot Name	VNI_DR07		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	26		20	20	1	9	4	6	0	0	0	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	71	71	20	33.6	15.9	1.5	0	0	0	0	
Acacia pendula	20	13	TG		20								
Rhagodia spinescens	25	100	SG			25							
Enteropogon acicularis	10	300	GG				10						
Salsola australis	0.5	50	SG			0.5							
Austrostipa scabra subsp. *scabra*	5	50	GG				5						
Enchylaena tomentosa	1	50	SG			1							
Rytidosperma setaceum	0.8	40	GG				0.8						
Maireana decalvans	1	50	SG			1							
Atriplex semibaccata	3	20	SG			3							
Sclerolaena muricata var. *muricata*	1	10	SG			1							
Maireana aphylla	2	5	SG			2							
Leiocarpa websteri	0.1	10	FG					0.1					
Sida corrugata	0.1	10	FG					0.1					
Oxalis perennans	0.1	10	FG					0.1					
Vittadinia cuneata	0.1	5	FG					0.1					
Teucrium racemosum	0.1	5	FG					0.1					
Carex inversa	0.1	5	GG				0.1						
Einadia nutans	1	20	FG					1					
Senna artemisioides subsp. *filifolia*	0.1	1	SG			0.1							
Sclerolaena diacantha			SG			0							

Easting	363968
Northing	6120787
Orientation	85
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	yes
10-19	yes
5-9	yes
<5	yes
Hollows	0
Length logs (m)	13
BAM Attributes 1x1 plot (%)	
Litter (%)	18

VNI_DR08

Date	31/01/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR08		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	26		29	23	2	10	6	4	0	1	5	1	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	51.1	46.6	10	21.9	14	0.6	0	0.1	4.3	0.2	
Acacia pendula	7	5	TG		7								
Acacia oswaldii	3	1	TG		3								
Rhagodia spinescens	8	20	SG			8							
Sclerolaena muricata var. *semiglabra*	2	20	SG			2							
Maireana aphylla	5	10	SG			5							
Teucrium racemosum	0.2	20	FG					0.2					
Enteropogon acicularis	5	50	GG				5						
Atriplex semibaccata	3	20	SG			3							
Austrostipa scabra subsp. *scabra*	2	30	GG				2						
Enchylaena tomentosa	0.3	20	SG			0.3							
Sclerolaena diacantha	1	50	SG			1							
Maireana decalvans	1	20	SG			1							
Salsola australis	0.3	20	SG			0.3							
*Spergularia rubra**	0.1	5	EX								0.1		
Chloris truncata	1	30	GG				1						
Maireana pentatropis	1	100	SG			1							
Rytidosperma caespitosum	1	30	GG				1						
Convolvulus erubescens	0.1	1	OG							0.1			
Sida corrugata	0.2	20	FG					0.2					
*Medicago sp.**	0.1	5	EX								0.1		
*Heliotropium europaeum**	2	20	EX								2		
*Marrubium vulgare**	2	10	EX								2		
Alternanthera nana	0.1	5	FG					0.1					
Rumex spp.	0.1	1	FG					0.1					
Carex inversa	2	30	GG				2						
Eriochloa crebra	3	30	GG				3						
*Lepidium africanum**	0.1	5	EX								0.1		
Atriplex leptocarpa	0.3	20	SG			0.3							
*Lycium ferocissimum**	0.2	3	HT									0.2	

Easting	363993
Northing	6120712
Orientation	250
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	2
20-29	yes
10-19	yes
5-9	no
<5	yes
Hollows	0
Length logs (m)	55
BAM Attributes 1x1 plot (%)	
Litter (%)	22.6

VNI_DR62

Date	29/08/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR62		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	26		27	27	1	7	1	16	1	1	2	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	55.3	55.1	20	28	0.1	4.9	0.1	2	0.2	0	
Acacia pendula	20	8	TG		20								
Amyema quandang var. *quandang*	2	4	OG							2			
Rhagodia spinescens	20	50	SG			20							
Maireana aphylla	5	15	SG			5							
Swainsona procumbens	0.1	10	FG					0.1					
Maireana pentagona	0.2	50	FG					0.2					
Oxalis perennans	0.1	50	FG					0.1					
Calotis scabiosifolia var. *scabiosifolia*	0.2	100	FG					0.2					
Rhodanthe corymbiflora	3	500	FG					3					
Atriplex semibaccata	2	5	SG			2							
Hyalosperma glutinosum subsp. *glutinc*	0.1	20	FG					0.1					
Alternanthera nana	0.1	20	FG					0.1					
Rytidosperma caespitosum	0.1	20	GG				0.1						
Sclerolaena stelligera	0.2	50	SG			0.2							
Sida corrugata	0.1	50	FG					0.1					
Bulbine semibarbata	0.1	10	FG					0.1					
Teucrium racemosum	0.1	10	FG					0.1					
Euphorbia drummondii	0.1	10	FG					0.1					
Sclerolaena muricata var. *semiglabra*	0.2	20	SG			0.2							
*Lolium perenne**	0.1	50	EX								0.1		
Salsola australis	0.1	20	SG			0.1							
Crassula sieberiana	0.2	200	FG					0.2					
Sida trichopoda	0.2	100	FG					0.2					
Daucus glochidiatus	0.1	10	FG					0.1					
Cotula australis	0.1	10	FG					0.1					
Plantago turrifera	0.1	50	FG					0.1					
*Alopecurus geniculatus**	0.1	20	EX								0.1		
Marsilea drummondii	0.1	50	EG						0.1				
Maireana decalvans	0.5	50	SG			0.5							

Easting	3466742
Northing	6114558
Orientation	75
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	Yes
10-19	Yes
5-9	No
<5	Yes
Hollows	0
Length logs (m)	15
Attributes 1x1 plot (%)	
Litter (%)	32

VNI_DR73

Date	12/09/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR73		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	26		20	15	1	6	3	5	0	0	5	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	34.7	31	3	10.5	16	1.5	0	0	3.7	0	
Acacia pendula	3	4	TG		3								
Maireana aphylla	4	10	SG			4							
Rhagodia spinescens	1	3	SG			1							
Sclerolaena muricata var. *semiglabra*	1	20	SG			1							
Salsola australis	0.5	20	SG			0.5							
*Lolium perenne**	2	100	EX								2		
Rhodanthe corymbiflora	1	200	FG					1					
Sida corrugata	0.1	5	FG					0.1					
Sclerolaena diacantha	2	50	SG			2							
Rytidosperma caespitosum	1	40	GG				1						
*Medicago sp.**	1	200	EX								1		
Crassula sieberiana	0.2	2000	FG					0.2					
Atriplex semibaccata	2	30	SG			2							
Vittadinia cuneata var. *cuneata*	0.1	5	FG					0.1					
*Arctotheca calendula**	0.4	5	EX								0.4		
Austrostipa scabra subsp. scabra	10	70	GG				10						
*Cotula bipinnata**	0.1	10	EX								0.1		
Enteropogon acicularis	5	20	GG				5						
*Echium plantagineum**	0.2	20	EX								0.2		
Erodium crinitum	0.1	5	FG					0.1					

Easting	368087
Northing	6121369
Orientation	240
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	1
20-29	Yes
10-19	Yes
5-9	No
<5	Yes
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	21

VNI_DR82

Date	17/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR82		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	26		38	34	1	6	6	18	2	1	4	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	50.8	40.6	3	13	16.3	7.9	0.2	0.2	10.2	0	
Acacia pendula	3	4	TG		3								
Maireana aphylla	10	20	SG			10							
Rhagodia spinescens	1	5	SG			1							
Rhodanthe corymbiflora	2	500	FG					2					
Sclerolaena muricata var. semiglabra	0.5	5	SG			0.5							
*Medicago laciniata**	5	200	EX								5		
Salsola australis	1	50	SG			1							
Sida trichopoda	0.1	10	FG					0.1					
Crassula sieberiana	0.1	50	FG					0.1					
Bulbine bulbosa	0.1	10	FG					0.1					
Atriplex leptocarpa	0.4	20	SG			0.4							
*Lolium perenne**	5	100	EX								5		
Rytidosperma caespitosum	10	60	GG				10						
Oxalis perennans	0.2	30	FG					0.2					
Einadia nutans	1	5	FG					1					
Goodenia pusilliflora	0.1	10	FG					0.1					
Enteropogon acicularis	1	20	GG				1						
Calocephalus sonderi	1	200	FG					1					
*Cotula bipinnata**	0.1	20	EX								0.1		
Austrostipa scabra	5	100	GG				5						
Maireana pentagona	1	30	FG					1					
Amyema quandang	0.2	1	OG							0.2			
Sporobolus caroli	0.1	5	GG				0.1						
Vittadinia cuneata	0.1	5	FG					0.1					
*Spergularia rubra**	0.1	10	EX								0.1		
Ptilotus semilanatus	0.1	2	FG					0.1					
Wurmbea dioica subsp. dioica	0.1	5	FG					0.1					
Swainsona procumbens	0.1	10	FG					0.1					
Chloris truncata	0.1	5	GG				0.1						
Calotis scabiosifolia var. scabiosifolia	0.6	20	FG					0.6					
Myriocephalus rhizocephalus	1	200	FG					1					
Pilularia novae-hollandiae	0.1	50	EG						0.1				
Euphorbia drummondii	0.1	10	FG					0.1					
Alternanthera nana	0.1	10	FG					0.1					
Marsilea drummondii	0.1	10	EG						0.1				
Triptilodiscus pygmaeus	0.1	5	FG					0.1					
Juncus usitatus	0.1	5	GG				0.1						
Enchylaena tomentosa	0.1	1	SG			0.1							

Easting	365990
Northing	6120976
Orientation	266
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	Yes
10-19	Yes
5-9	Yes
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	1

VNI_DR85

Date	17/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR84		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	26		28	25	1	8	4	11	0	1	3	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	41.2	38.1	5	9.7	20	2.4	0	1	3.1	0	
Acacia pendula	5	11	TG		5								
Rhagodia spinescens	4	20	SG			4							
Amyema quandang var. quandang	1	1	OG							1			
Rhodanthe corymbiflora	0.1	30	FG					0.1					
Rytidosperma caespitosum	10	200	GG				10						
Rytidosperma setaceum	5	200	GG				5						
*Lolium perenne**	2	300	EX								2		
Salsola australis	0.2	10	SG			0.2							
*Medicago sp.**	1	1000	EX								1		
Enchylaena tomentosa	1	30	SG			1							
Sclerolaena muricata var. semiglabra	1	10	SG			1							
Sida corrugata	0.5	10	FG					0.5					
Atriplex semibaccata	1	20	SG			1							
Einadia nutans	1	20	FG					1					
Austrostipa scabra subsp. scabra	1	40	GG				1						
Sclerolaena stelligera	0.1	10	SG			0.1							
*Lepidium africanum**	0.1	5	EX								0.1		
Maireana aphylla	2	20	SG			2							
Enteropogon acicularis	4	40	GG				4						
Maireana enchylaenoides	0.1	10	FG					0.1					
Sclerolaena diacantha	0.4	30	SG			0.4							
Arthropodium minus	0.1	10	FG					0.1					
Vittadinia cuneata var. cuneata	0.1	10	FG					0.1					
Sida trichopoda	0.1	10	FG					0.1					
Bulbine bulbosa	0.1	10	FG					0.1					
Zygophyllum glaucum	0.1	5	FG					0.1					
Euphorbia drummondii	0.1	5	FG					0.1					
Chrysocephalum apiculatum	0.1	5	FG					0.1					

Easting	374315
Northing	6123358
Orientation	80
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	Yes
10-19	Yes
5-9	No
<5	Yes
Hollows	0
Length logs (m)	2
Attributes 1x1 plot (%)	
Litter (%)	5

D2.12 PCT 26 – Weeping Myall open woodland of the Riverina Bioregion and NSW Southwestern Slopes Bioregion (Thinned)

VNI_DR29

Date	2/05/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR29		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	26		15	13	1	4	4	4	0	0	2	1	
Condition	Thinned		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	58.7	56.6	2	26	28.1	0.5	0	0	2.1	2	
Acacia pendula	2	2	TG		2								
Maireana aphylla	25	100	SG			25							
Enteropogon acicularis	20	500	GG				20						
Austrostipa scabra subsp. scabra	5	100	GG				5						
Rytidosperma caespitosum	3	50	GG				3						
*Medicago laciniata**	0.1	1000	EX								0.1		
Sclerolaena diacantha	0.2	10	SG			0.2							
Einadia nutans	0.1	1	FG					0.1					
Sida corrugata	0.2	20	FG					0.2					
Maireana pentagona	0.1	20	FG					0.1					
Sporobolus caroli	0.1	20	GG				0.1						
Salsola australis	0.2	20	SG			0.2							
Solanum esuriale	0.1	5	FG					0.1					
*Lycium ferocissimum**	2	1	HT									2	
Rhagodia spinescens	0.6	1	SG			0.6							

Easting	361679
Northing	6119448
Orientation	170
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	1
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	6
Attributes 1x1 plot (%)	
Litter (%)	12

VNI_DR30

Date	2/05/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR30		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	26		27	25	1	7	6	10	1	0	2	0	
Condition	Thinned		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	32.5	31.9	2	21.5	6.3	2	0.1	0	0.6	0	
Acacia pendula	2	15	TG		2								
Maireana aphylla	20	100	SG			20							
Enteropogon acicularis	5	100	GG				5						
Sclerolaena muricata var. semiglabra	0.8	10	SG			0.8							
*Spergularia rubra**	0.1	5	EX								0.1		
Atriplex semibaccata	0.2	10	SG			0.2							
Sida corrugata	0.1	10	FG					0.1					
Rytidosperma setaceum	0.3	10	GG				0.3						
Teucrium racemosum	0.1	5	FG					0.1					
Juncus usitatus	0.2	20	GG				0.2						
Boerhavia coccinea	0.1	5	FG					0.1					
Einadia nutans	0.2	20	FG					0.2					
Marsilea drummondii	0.1	30	EG						0.1				
Salsola australis	0.1	10	SG			0.1							
Rhagodia spinescens	0.2	10	SG			0.2							
Eleocharis pusilla	0.1	20	GG				0.1						
Alternanthera nana	0.4	50	FG					0.4					
Oxalis perennans	0.2	20	FG					0.2					
Maireana decalvans	0.1	1	SG			0.1							
Sclerolaena stelligera	0.1	5	SG			0.1							
Erodium crinitum	0.6	50	FG					0.6					
*Echium plantagineum**	0.5	50	EX								0.5		
Rytidosperma caespitosum	0.5	20	GG				0.5						
Solanum esuriale	0.1	10	FG					0.1					
Goodenia pinnatifida	0.1	5	FG					0.1					
Vittadinia cuneata	0.1	5	FG					0.1					
Austrostipa scabra subsp. scabra	0.2	10	GG				0.2						

Easting	359970
Northing	6118763
Orientation	70
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	1
20-29	no
10-19	yes
5-9	yes
<5	yes
Hollows	0
Length logs (m)	4
Attributes 1x1 plot (%)	
Litter (%)	4

VNI_DR61

Date	29/08/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR61		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	26		19	7	1	4	0	2	0	0	12	1	
Condition	Thinned		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	67.3	24.3	5	18.1	0	1.2	0	0	43	1	
Eucalyptus camaldulensis	5	1	TG		5								
Rhagodia spinescens	15	30	SG			15							
*Lycium ferocissimum**	1	1	HT									1	
*Hordeum leporinum**	20	1000	EX								20		
*Echium plantagineum**	5	100	EX								5		
*Marrubium vulgare**	5	50	EX								5		
*Medicago laciniata**	5	2000	EX								5		
Erodium crinitum	1	50	FG					1					
Salsola australis	0.1	10	SG			0.1							
*Malva parviflora**	1	20	EX								1		
Atriplex semibaccata	2	20	SG			2							
*Urtica dioica**	2	100	EX								2		
*Sonchus oleraceus**	0.3	30	EX								0.3		
Enchylaena tomentosa	1	10	SG			1							
*Sisymbrium officinale**	2	70	EX								2		
Einadia nutans	0.2	10	FG					0.2					
*Amsinckia intermedia**	0.2	10	EX								0.2		
*Lepidium africanum**	0.5	50	EX								0.5		
*Schismus barbatus**	1	200	EX								1		

Easting	347370
Northing	6114813
Orientation	175
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	1
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	1
Length logs (m)	10
Attributes 1x1 plot (%)	
Litter (%)	16

VNI_DR83

Date	17/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR83		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	26		27	19	1	5	3	9	0	1	8	0	
Condition	Thinned		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	63.5	34.1	2	2.2	27	2.8	0	0.1	29.4	0	
Acacia pendula	2	9	TG		2								
*Medicago laciniata**	20	4000	EX								20		
*Lolium perenne**	5	1000	EX								5		
*Vulpia myuros**	2	500	EX								2		
Enteropogon acicularis	20	100	GG				20						
Austrostipa scabra subsp. scabra	2	60	GG				2						
Sida corrugata	2	100	FG					2					
Crassula sieberiana	0.1	5	FG					0.1					
Rhodanthe corymbiflora	0.1	20	FG					0.1					
Erodium crinitum	0.1	5	FG					0.1					
Rytidosperma caespitosum	5	100	GG				5						
*Echium plantagineum**	1	40	EX								1		
Enchylaena tomentosa	1	10	SG			1							
*Avena sp.**	0.4	20	EX								0.4		
*Sonchus oleraceus**	0.1	5	EX								0.1		
Leucochrysum molle	0.1	20	FG					0.1					
Boerhavia coccinea	0.1	5	FG					0.1					
Atriplex leptocarpa	0.1	5	SG			0.1							
Vittadinia cuneata var. hirsuta	0.1	2	FG					0.1					
Sclerolaena muricata var. semiglabra	0.7	10	SG			0.7							
*Hordeum leporinum**	0.8	30	EX								0.8		
Atriplex semibaccata	0.3	5	SG			0.3							
Sclerolaena diacantha	0.1	5	SG			0.1							
Convolvulus erubescens	0.1	5	OG							0.1			
Solanum esuriale	0.1	10	FG					0.1					
*Arctotheca calendula**	0.1	5	EX								0.1		
Ptilotus semilanatus	0.1	5	FG					0.1					

Easting	369488
Northing	6121499
Orientation	355
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	Yes
5-9	Yes
<5	Yes
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	1

VNI_DR84

Date	17/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR84		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	26		20	17	1	6	3	7	0	0	3	0	
Condition	Thinned		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	31.1	19.7	2	5.4	11	1.3	0	0	11.4	0	
Acacia pendula	2	13	TG		2								
*Lolium perenne**	10	400	EX								10		
Walwhalleya proluta	3	50	GG				3						
Atriplex semibaccata	2	30	SG			2							
Sclerolaena muricata var. semiglabra	1	20	SG			1							
*Medicago laciniata**	1	500	EX								1		
Einadia nutans	0.2	10	FG					0.2					
Sclerolaena diacantha	1	50	SG			1							
Enchylaena tomentosa	1	20	SG			1							
Teucrium racemosum	0.3	20	FG					0.3					
*Avena sp.**	0.4	30	EX								0.4		
Sclerolaena stelligera	0.2	20	SG			0.2							
Vittadinia cuneata var. cuneata	0.2	30	FG					0.2					
Enteropogon acicularis	5	30	GG				5						
Sida trichopoda	0.2	20	FG					0.2					
Maireana enchylaenoides	0.1	10	FG					0.1					
Rytidosperma caespitosum	3	50	GG				3						
Leiocarpa panaetioides	0.2	1	FG					0.2					
Sclerolaena muricata var. muricata	0.2	5	SG			0.2							
Calotis scabiosifolia var. scabiosifolia	0.1	5	FG					0.1					

Easting	371524
Northing	6122481
Orientation	200
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	Yes
5-9	Yes
<5	Yes
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	3

VNI_MP19

Date	10/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_MP19		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	26		19	16	1	3	5	7	0	0	3	0	
Condition	Thinned		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	96.7	78.6	10	35.5	31.2	1.9	0	0	18.1	0	
Acacia pendula	10	3	TG		10								
Maireana aphylla	30	50	SG			30							
Rytidosperma caespitosum	8	200	GG				8						
Enchylaena tomentosa	0.1	10	GG				0.1						
Rytidosperma spp	8	100	GG				8						
Austrostipa scabra	15	100	GG				15						
Crassula sieberiana	0.1	1	FG					0.1					
Rhodanthe corymbiflora	0.5	20	FG					0.5					
Vittadinia cuneata	0.5	5	FG					0.5					
*Medicago praecox**	10	100	EX								10		
Sporobolus caroli	0.1	10	GG				0.1						
Leiocarpa panaetioides	0.1	1	FG					0.1					
Side corrugata	0.1	5	FG					0.1					
Einadia nutans	0.1	2	FG					0.1					
Rhagodia spinescens	5	30	SG			5							
*Lolium rigidum**	8	20	EX								8		
Maireana ciliata	0.5	10	FG					0.5					
Atriplex semibaccata	0.5	10	SG			0.5							
*Romulea rosea**	0.1	1	EX								0.1		

Easting	356007
Northing	6118174
Orientation	122
Plot size	20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	Yes
10-19	Yes
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	4.6

D2.13 PCT 26 – Weeping Myall open woodland of the Riverina Bioregion and NSW Southwestern Slopes Bioregion (Planted Native Vegetation)

VNI_DR120

Date	10/04/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR120		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	26		10	10	1	4	2	2	1	0	0	0	
Condition	Planted Native Vegetation		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	13.3	13.3	2	9	2	0.2	0.1	0	0	0	
Eucalyptus spp.	2	1	TG		2								
Atriplex nummularia	2	4	SG			2							
Chenopodium nitrariaceum	5	20	SG			5							
Atriplex semibaccata	1	50	SG			1							
Austrostipa scabra subsp. scabra	1	50	GG				1						
Erodium crinitum	0.1	20	FG					0.1					
Marsilea drummondii	0.1	50	EG						0.1				
Enteropogon acicularis	1	30	GG				1						
Sclerolaena muricata var. semiglabra	1	20	SG			1							
Solanum esuriale	0.1	10	FG					0.1					

Easting	356799
Northing	6118518
Orientation	95
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	1
30-49	5
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	4
Attributes 1x1 plot (%)	
Litter (%)	2

D2.14 PCT 28 – White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone (Derived)

VNI_DR27

Date	1/05/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR27		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	28		16	16	0	6	5	4	0	1	0	0	
Condition	Derived		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	48.1	48.1	0	3.7	43	1.3	0	0.1	0	0	
Enteropogon ramosus	15	200	GG				15						
Sporobolus caroli	15	200	GG				15						
Austrostipa scabra subsp. scabra	10	200	GG				10						
Solanum esuriale	0.7	50	FG					0.7					
Vittadinia cuneata	0.4	50	FG					0.4					
Sclerolaena diacantha	0.8	20	SG			0.8							
Sida intricata	0.2	10	SG			0.2							
Chloris truncata	2	50	GG				2						
Convolvulus erubescens	0.1	5	OG							0.1			
Maireana decalvans	0.1	5	SG			0.1							
Rytidosperma caespitosum	1	100	GG				1						
Sida trichopoda	0.1	20	FG					0.1					
Einadia nutans	0.1	10	FG					0.1					
Enchylaena tomentosa	2	20	SG			2							
Rhagodia spinescens	0.3	1	SG			0.3							
Maireana georgei	0.3	10	SG			0.3							

Easting	769417
Northing	6119756
Orientation	125
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	no
10-19	no
5-9	no
<5	no
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_DR42

Date	5/05/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR42		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	28		13	13	0	4	5	3	0	1	0	0	
Condition	Derived		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	30.6	30.6	0	3	27.2	0.3	0	0.1	0	0	
Austrostipa scabra subsp. scabra	10	200	GG				10						
Enteropogon acicularis	15	200	GG				15						
Sida intricata	0.4	5	SG			0.4							
Salsola australis	0.1	5	SG			0.1							
Sporobolus caroli	1	40	GG				1						
Chloris truncata	1	60	GG				1						
Sclerolaena muricata var. semiglabra	2	20	SG			2							
Solanum esuriale	0.1	5	FG					0.1					
Eragrostis parviflora	0.2	10	GG				0.2						
Sida corrugata	0.1	5	FG					0.1					
Dysphania pumilio	0.1	5	FG					0.1					
Rhagodia spinescens	0.5	1	SG			0.5							
Convolvulus erubescens	0.1	5	OG							0.1			

Easting	293858
Northing	6114652
Orientation	230
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	no
10-19	no
5-9	no
<5	no
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_DR44

Date	5/05/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR44		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	28		19	18	0	6	6	5	0	1	1	0	
Condition	Derived		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	33.2	33.1	0	3.1	29.3	0.6	0	0.1	0.1	0	
Austrostipa scabra subsp. scabra	25	500	GG				25						
Sclerolaena muricata var. villosa	1	2	SG			1							
Salsola australis	0.4	20	SG			0.4							
Enteropogon acicularis	1	30	GG				1						
Eragrostis parviflora	2	30	GG				2						
Maireana aphylla	0.4	2	SG			0.4							
Sida intricata	1	20	SG			1							
Rytidosperma caespitosum	0.6	20	GG				0.6						
Oxalis perennans	0.1	5	FG					0.1					
Eriochlamys behrii	0.2	100	FG					0.2					
Euphorbia drummondii	0.1	5	FG					0.1					
Sida corrugata	0.1	5	FG					0.1					
*Medicago laciniata**	0.1	5	EX								0.1		
Maireana pentagona	0.1	5	FG					0.1					
Sclerolaena tricuspis	0.2	1	SG			0.2							
Fimbristylis dichotoma	0.1	5	GG				0.1						
Chloris truncata	0.6	10	GG				0.6						
Convolvulus erubescens	0.1	5	OG							0.1			
Sclerolaena brachyptera	0.1	5	SG			0.1							

Easting	291109
Northing	6115580
Orientation	35
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	no
10-19	no
5-9	no
<5	no
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_DR55

Date	27/08/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR55		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	28		9	4	0	0	2	2	0	0	5	0	
Condition	Derived		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	75.1	11.1	0	0	6	5.1	0	0	64	0	
*Hordeum leporinum**	45	2000	EX								45		
Erodium crinitum	5	200	FG					5					
*Echium plantagineum**	15	200	EX								15		
Austrostipa scabra subsp. scabra	1	20	GG				1						
Sporobolus caroli	5	30	GG				5						
Crassula sieberiana	0.1	100	FG					0.1					
*Medicago laciniata**	1	2000	EX								1		
*Vulpia myuros**	2	1000	EX								2		
*Arctotheca calendula**	1	20	EX								1		

Easting	364852
Northing	6120581
Orientation	245
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_DR58

Date	29/08/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR58		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	28		9	4	0	0	1	3	0	0	5	0	
Condition	Derived		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	73.7	32.7	0	0	30	2.7	0	0	41	0	
Enteropogon acicularis	30	200	GG				30						
*Hordeum leporinum**	15	1000	EX								15		
*Medicago laciniata**	10	2000	EX								10		
*Echium plantagineum**	10	500	EX								10		
*Vulpia myuros**	5	1000	EX								5		
Erodium crinitum	2	100	FG					2					
*Hypochaeris radicata**	1	50	EX								1		
Sida corrugata	0.5	100	FG					0.5					
Oxalis perennans	0.2	100	FG					0.2					

Easting	348152
Northing	6115195
Orientation	180
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	0
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	2
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_DR60

Date	29/08/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR60		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	28		10	5	0	0	0	5	0	0	5	0	
Condition	Derived		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	64.4	17.4	0	0	0	17.4	0	0	47	0	
*Echium plantagineum**	15	500	EX								15		
Erodium crinitum	15	1000	FG					15					
*Medicago laciniata**	20	5000	EX								20		
Crassula sieberiana	2	1000	FG					2					
*Hordeum leporinum**	5	500	EX								5		
*Vulpia myuros**	2	100	EX								2		
*Urtica urens**	5	1000	EX								5		
Calotis hispidula	0.2	100	FG					0.2					
Sida corrugata	0.1	50	FG					0.1					
Oxalis perennans	0.1	100	FG					0.1					

Easting	347604
Northing	6114923
Orientation	250
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	2
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_DR91

Date	20/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR91		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	28		26	19	0	5	4	9	1	0	7	0	
Condition	Derived		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	56.8	36.3	0	7.2	27	2	0.1	0	20.5	0	
Austrostipa scabra subsp. scabra	20	1000	GG				20						
Maireana aphylla	2	20	SG			2							
Enteropogon acicularis	5	40	GG				5						
*Vulpia myuros**	15	3000	EX								15		
Cheilanthes sieberi	0.1	20	EG						0.1				
*Medicago laciniata**	5	3000	EX								5		
Crassula sieberiana	0.1	50	FG					0.1					
Rytidosperma setaceum	1	40	GG				1						
Sida corrugata	0.2	10	FG					0.2					
Calotis hispidula	0.1	10	FG					0.1					
Hyalosperma glutinosum subsp. glutinc	0.1	5	FG					0.1					
Salsola australis	0.1	10	SG			0.1							
Sclerolaena muricata var. villosa	2	20	SG			2							
*Spergularia rubra**	0.1	5	EX								0.1		
Maireana pentagona	1	200	FG					1					
Rytidosperma caespitosum	1	30	GG				1						
Einadia nutans	0.2	10	FG					0.2					
Sida intricata	3	30	SG			3							
*Echium plantagineum**	0.1	10	EX								0.1		
Rhodanthe corymbiflora	0.1	10	FG					0.1					
Oxalis perennans	0.1	5	FG					0.1					
*Hordeum leporinum**	0.1	10	EX								0.1		
Vittadinia cuneata	0.1	5	FG					0.1					
Atriplex spp.	0.1	5	SG			0.1							
*Cotula bipinnata**	0.1	5	EX								0.1		
*Medicago minima**	0.1	20	EX								0.1		

Easting	291249
Northing	6115116
Orientation	22
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_NM08

Date	7/09/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThrea	54
Plot Name	VNI_NM08		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	28		31	22	1	9	3	9	0	0	9	0	
Condition	Derived		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	74	65	3	41	7	14	0	0	9	0	
Rhagodia spinescens	15	100	SG			15							
Eremophila longifolia	5	50	SG			5							
Crassula colorata	5	50	FG					5					
Maireana brevifolia	1	50	SG			1							
Maireana spp.	1	20	SG			1							
Calandrinia eremaea	1	50	FG					1					
*Hordeum leporinum**	1	100	EX								1		
*Lolium rigidum**	1	300	EX								1		
Rhodanthe corymbiflora	1	50	FG					1					
*Vulpia bromoides**	1	200	EX								1		
Calotis hispidula	1	50	FG					1					
Austrostipa scabra	1	50	GG				1						
Vittadinia cuneata	2	100	FG					2					
Calocephalus sonderi	1	300	FG					1					
*Medicago praecox**	1	500	EX								1		
Brachyscome lineariloba	1	500	FG					1					
Dodonaea viscosa	10	20	SG			10							
*Schismus barbatus**	1	20	EX								1		
*Arctotheca calendula**	1	20	EX								1		
Enchylaena tomentosa	5	50	SG			5							
Oxalis perennans	1	50	FG					1					
*Echium plantagineum**	1	50	EX								1		
Dissocarpus paradoxus	1	10	SG			1							
Austrostipa nitida	5	50	GG				5						
*Limonium sinuatum**	1	20	EX								1		
*Sisymbrium irio**	1	10	EX								1		
Acacia oswaldii	3	1	TG		3								
Sclerolaena tricuspis	1	20	SG			1							
Nitraria billardierei	2	5	SG			2							
Austrostipa elegantissima	1	10	GG				1						
Einadia nutans	1	10	FG					1					

Easting	218008
Northing	6117028
Orientation	288
Plot size	20 X 20 X 50
ttributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m	0
ttributes 1x1 plot (%)	
Litter (%)	0

VNI_OZ01

Date	30/08/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_OZ01		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	28		12	8	0	2	2	4	0	0	4	0	
Condition	Derived		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	72.5	52.3	0	15	35	2.3	0	0	20.2	0	
Enteropogon acicularis	20	200	GG				20						
Maireana aphylla	5	10	SG			5							
*Medicago sp.**	10	1000	EX								10		
Crassula sieberiana	1	500	FG					1					
Oxalis perennans	0.1	200	FG					0.1					
Calotis scabiosifolia	0.2	200	FG					0.2					
Erodium crinitum	1	100	FG					1					
*Hordeum leporinum**	10	1000	EX								10		
Sida intricata	10	50	SG			10							
*Sonchus oleraceus**	0.1	30	EX								0.1		
*Lolium perenne**	0.1	200	EX								0.1		
Austrostipa scabra	15	500	GG				15						

Easting	293008
Northing	6114667
Orientation	330
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNIOZ_12

Date	20/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNIOZ_12		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	28		16	11	0	5	2	4	0	0	5	0	
Condition	Derived		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	67.1	43.9	0	33.2	10.2	0.5	0	0	23.2	0	
Maireana aphylla	5	5	SG			5							
Sclerolaena muricata var. semiglabra	25	100	SG			25							
Enteropogon acicularis	10	500	GG				10						
*Vulpia myuros**	20	9000	EX								20		
*Hordeum leporinum**	2	200	EX								2		
*Medicago laciniata**	1	1000	EX								1		
Sida intricata	3	50	SG			3							
Crassula sieberiana	0.2	500	FG					0.2					
Calotis hispidula	0.1	50	FG					0.1					
Austrostipa scabra	0.2	200	GG				0.2						
*Echium plantagineum**	0.1	20	EX								0.1		
Chenopodium desertorum subsp. virosum	0.1	1	SG			0.1							
Enchylaena tomentosa	0.1	1	SG			0.1							
*Trifolium arvense**	0.1	50	EX								0.1		
Rhodanthe corymbiflora	0.1	5	FG					0.1					
Oxalis perennans	0.1	2	FG					0.1					

Easting	292396
Northing	6114844
Orientation	163
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

D2.15 PCT 28 – White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone (Derived_TS)

VNI_DR41

Date	5/05/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR41		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	28		21	14	0	9	3	2	0	0	7	1	
Condition	Derived Tall Shrubland		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	18.8	16.2	0	14.3	1.6	0.3	0	0	2.6	1	
Hakea tephrosperma	5	8	SG			5							
Rhagodia spinescens	5	15	SG			5							
Atriplex leptocarpa	0.4	20	SG			0.4							
Enchylaena tomentosa	3	10	SG			3							
Sporobolus caroli	0.4	30	GG				0.4						
*Schismus barbatus**	0.5	50	EX								0.5		
Atriplex eardleyae	0.2	10	SG			0.2							
*Marrubium vulgare**	0.3	5	EX								0.3		
*Lycium ferocissimum**	1	1	HT									1	
*Cucumis myriocarpus**	0.1	5	EX								0.1		
*Heliotropium europaeum**	0.2	10	EX								0.2		
*Chenopodium album**	0.4	20	EX								0.4		
Salsola australis	0.1	5	SG			0.1							
Atriplex vesicaria	0.2	1	SG			0.2							
Sida intricata	0.1	5	SG			0.1							
Austrostipa scabra subsp. scabra	0.2	20	GG				0.2						
Einadia nutans	0.2	5	FG					0.2					
Enteropogon acicularis	1	20	GG				1						
*Chondrilla juncea**	0.1	5	EX								0.1		
Dysphania pumilio	0.1	5	FG					0.1					
Atriplex semibaccata	0.3	5	SG			0.3							

Easting	293944
Northing	6114695
Orientation	115
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	yes
10-19	yes
5-9	no
<5	yes
Hollows	0
Length logs (m)	34
Attributes 1x1 plot (%)	
Litter (%)	6

VNI_DR92

Date	20/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR92		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	28		23	16	1	10	3	2	0	0	7	0	
Condition	Derived Tall shrubland		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	52.8	35.4	1	20.1	12.2	2.1	0	0	17.4	0	
Hakea tephrosperma	5	30	SG			5							
Acacia oswaldii	1	2	TG		1								
Rhagodia spinescens	3	5	SG			3							
Enteropogon acicularis	10	50	GG				10						
Salsola australis	0.1	5	SG			0.1							
*Echium plantagineum**	1	30	EX								1		
*Hordeum leporinum**	10	100	EX								10		
*Medicago laciniata**	2	3000	EX								2		
*Lolium perenne**	2	1000	EX								2		
Austrostipa scabra subsp. scabra	2	100	GG				2						
Atriplex semibaccata	3	50	SG			3							
Atriplex leptocarpa	1	60	SG			1							
Sida intricata	2	30	SG			2							
Sclerolaena muricata var. villosa	1	10	SG			1							
Crassula sieberiana	0.1	100	FG					0.1					
Sclerolaena muricata var. semiglabra	1	5	SG			1							
Sporobolus caroli	0.2	20	GG				0.2						
*Sisymbrium orientale**	0.3	20	EX								0.3		
Einadia nutans	2	20	FG					2					
Nitraria billardierei	2	1	SG			2							
Atriplex eardleyae	2	40	SG			2							
*Lamarckia aurea**	0.1	10	EX								0.1		
*Vulpia myuros**	2	500	EX								2		

Easting	292505
Northing	6114742
Orientation	168
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	3
Attributes 1x1 plot (%)	
Litter (%)	1

VNI_MP01

Date	27/08/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_MP01		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	28		13	6	1	3	0	2	0	0	7	1	
Condition	Derived Tall Shrubland		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	64.3	31.1	20	8.1	0	3	0	0	33.2	2	
Alectryon oleifolius	20	7	TG		20								
Rhagodia spinescens	5	6	SG			5							
*Hordeum leporinum**	25	5	EX								25		
*Lycium ferocissimum**	2	3	HT									2	
*Urtica urens**	1	50	EX								1		
*Amsinckia intermedia**	3	50	EX								3		
*Malva parviflora**	2	5	EX								2		
Erodium crinitum	2	5	FG					2					
*Echium plantagineum**	0.1	10	EX								0.1		
*Arctotheca calendula**	0.1	1	EX								0.1		
Maireana brevifolia	3	15	SG			3							
Crassula colorata	1	25	FG					1					
Enchylaena tomentosa	0.1	2	SG			0.1							

Easting	364690
Northing	6120588
Orientation	180
Plot size	20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	3.6

D2.16 PCT 28 – White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone (Thinned)

VNI_DR43

Date	5/05/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR43		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	28		14	12	1	6	2	3	0	0	2	0	
Condition	Thinned		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	19.9	19.6	3	4	12	0.6	0	0	0.3	0	
Callitris glaucophylla	3	1	TG		3								
Enteropogon acicularis	10	50	GG				10						
Scleroloena muricata var. semiglabra	2	5	SG			2							
Austrostipa scabra subsp. scabra	2	50	GG				2						
Enchylaena tomentosa	1	5	SG			1							
Sida intricata	0.3	10	SG			0.3							
Rhagodia spinescens	0.4	1	SG			0.4							
Einadia nutans	0.4	5	FG					0.4					
*Chenopodium album**	0.2	10	EX								0.2		
Atriplex semibaccata	0.2	10	SG			0.2							
Dysphania pumilio	0.1	5	FG					0.1					
*Schismus barbatus**	0.1	10	EX								0.1		
Salsola australis	0.1	5	SG			0.1							
Sida corrugata	0.1	5	FG					0.1					

Easting	292685
Northing	6115084
Orientation	70
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	1
20-29	no
10-19	no
5-9	no
<5	no
Hollows	0
Length logs (m)	5
Attributes 1x1 plot (%)	
Litter (%)	3

VNI_DR59

Date	29/08/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR59		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	28		15	7	1	1	0	5	0	0	8	1	
Condition	Thinned		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	66.5	15.3	5	5	0	5.3	0	0	51.2	2	
Callitris glaucophylla	5	1	TG		5								
Rhagodia spinescens	5	15	SG			5							
*Lycium ferocissimum**	2	4	HT									2	
Erodium crinitum	2	100	FG					2					
*Urtica urens**	2	20	EX								2		
*Hordeum leporinum**	20	1000	EX								20		
*Sisymbrium orientale**	2	50	EX								2		
*Malva parviflora**	5	50	EX								5		
*Echium plantagineum**	10	100	EX								10		
Sida corrugata	1	50	FG					1					
Crassula sieberiana	0.2	100	FG					0.2					
*Medicago laciniata**	10	5000	EX								10		
Stuartina muelleri	2	500	FG					2					
*Mesembryanthemum nodiflorum**	0.2	10	EX								0.2		
Calotis hispidula	0.1	10	FG					0.1					

Easting	347759
Northing	6114941
Orientation	320
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	1
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	1
Attributes 1x1 plot (%)	
Litter (%)	1

VNIOZ_07

Date	17/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNIOZ_07		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	28		16	7	1	1	2	3	0	0	9	1	
Condition	Thinned		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	53.8	11.3	5	2	4	0.3	0	0	42.5	0.1	
Callitris glaucophylla	5	1	TG		5								
Rhagodia spinescens	2	3	SG			2							
*Hordeum leporinum**	40	10000	EX								40		
Sida corrugata	0.1	10	FG					0.1					
*Medicago praecox**	0.5	1000	EX								0.5		
*Echium plantagineum**	0.2	100	EX								0.2		
*Trifolium arvense**	0.2	100	EX								0.2		
*Vulpia myuros**	0.2	200	EX								0.2		
*Schismus barbatus**	1	100	EX								1		
Austrostipa scabra	1	20	GG				1						
Enteropogon acicularis	3	100	GG				3						
*Lolium perenne**	0.2	200	EX								0.2		
*Lycium ferocissimum**	0.1	2	HT									0.1	
*Arctotheca calendula**	0.1	5	EX								0.1		
Erodium crinitum	0.1	2	FG					0.1					
Boerhavia coccinea	0.1	10	FG					0.1					

Easting	364974
Northing	6120597
Orientation	179
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	1
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	8
Attributes 1x1 plot (%)	
Litter (%)	0

D2.17 PCT 44 – Forb–rich Spear grass – Windmill Grass – White Top grassland of the Riverina Bioregion (Moderate_good)

VNI_DR14

Date	4/02/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR14		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	44		19	18	0	4	5	9	0	0	1	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	68.9	68.8	0	6.4	61.3	1.1	0	0	0.1	0	
Austrostipa scabra subsp. scabra	35	1000	GG				35						
Enteropogon acicularis	25	500	GG				25						
Maireana aphylla	5	10	SG			5							
Sida trichopoda	0.1	10	FG					0.1					
Alternanthera nana	0.1	5	FG					0.1					
Vittadinia cuneata	0.1	5	FG					0.1					
Solanum esuriale	0.2	20	FG					0.2					
Sclerolaena stelligera	0.3	30	SG			0.3							
Teucrium racemosum	0.2	20	FG					0.2					
Euphorbia drummondii	0.1	5	FG					0.1					
Chrysocephalum apiculatum	0.1	5	FG					0.1					
Maireana excavata	0.1	5	SG			0.1							
Oxalis perennans	0.1	5	FG					0.1					
Sclerolaena diacantha	1	40	SG			1							
Rytidosperma setaceum	1	60	GG				1						
Portulaca oleracea	0.1	1	FG					0.1					
Chloris truncata	0.2	10	GG				0.2						
*Sonchus oleraceus**	0.1	1	EX								0.1		
Juncus spp.	0.1	1	GG				0.1						

Easting	325943
Northing	6112105
Orientation	215
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_DR32

Date	3/05/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR32		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	44		11	10	0	3	4	3	0	0	1	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	32.9	32.8	0	3.7	27	2.1	0	0	0.1	0	
Rytidosperma caespitosum	20	500	GG				20						
Sporobolus caroli	5	100	GG				5						
Enteropogon acicularis	1	20	GG				1						
Maireana aphylla	2	5	SG			2							
Maireana pentagona	1	1000	FG					1					
Atriplex leptocarpa	0.7	30	SG			0.7							
Chloris truncata	1	30	GG				1						
Goodenia pinnatifida	0.1	1	FG					0.1					
Leiocarpa panaetioides	1	5	FG					1					
Atriplex semibaccata	1	20	SG			1							
*Medicago laciniata**	0.1	20	EX								0.1		

Easting	314004
Northing	6114080
Orientation	140
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

VNI_DR34

Date	3/05/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR34		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	44		17	16	0	4	4	8	0	0	1	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	48.9	48.8	0	2.7	45	1.1	0	0	0.1	0	
Austrostipa scabra subsp. scabra	20	300	GG				20						
Rytidosperma caespitosum	15	200	GG				15						
Sporobolus caroli	5	50	GG				5						
Eriochlamys behrii	0.3	100	FG					0.3					
Chloris truncata	5	200	GG				5						
Salsola australis	0.1	10	SG			0.1							
*Medicago laciniata**	0.1	10	EX								0.1		
Sida trichopoda	0.1	5	FG					0.1					
Maireana pentagona	0.2	100	FG					0.2					
Leiocarpa panaetioides	0.1	5	FG					0.1					
Maireana aphylla	2	10	SG			2							
Maireana excavata	0.2	20	SG			0.2							
Chrysocephalum apiculatum	0.1	5	FG					0.1					
Teucrium racemosum	0.1	5	FG					0.1					
Atriplex semibaccata	0.4	10	SG			0.4							
Pycnosorus thompsonianus	0.1	10	FG					0.1					
Plantago turrifera	0.1	10	FG					0.1					

Easting	316718
Northing	6114191
Orientation	205
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

VNI_DR63

Date	29/08/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR63		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	44		28	22	0	2	3	17	0	0	6	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	51.9	48.5	0	1.5	40	7	0	0	3.4	0	
Austrostipa scabra subsp. scabra	25	200	GG				25						
Enteropogon acicularis	5	50	GG				5						
Rhodanthe corymbiflora	0.3	50	FG					0.3					
Maireana excavata	1	50	SG			1							
Leucochrysum molle	1	50	FG					1					
*Medicago laciniata**	2	1000	EX								2		
Crassula sieberiana	0.1	100	FG					0.1					
Rytidosperma caespitosum	10	100	GG				10						
Goodenia pusilliflora	1	100	FG					1					
Swainsona phacoides	0.4	30	FG					0.4					
Wurmbea dioica subsp. dioica	0.1	100	FG					0.1					
*Lolium perenne**	1	60	EX								1		
Tricoryne elatior	0.1	20	FG					0.1					
Goodenia fascicularis	1	100	FG					1					
Rhodanthe pygmaea	0.4	100	FG					0.4					
Calotis scabiosifolia var. scabiosifolia	1	50	FG					1					
Maireana aphylla	0.5	1	SG			0.5							
*Romulea minutiflora**	0.1	5	EX								0.1		
Hyalosperma glutinosum subsp. glutinc	1	200	FG					1					
Erodium crinitum	0.1	5	FG					0.1					
Ptilotus spathulatus f. spathulatus	0.1	5	FG					0.1					
*Vulpia myuros**			EX								0		
Leiocarpa panaetioides	0.1	2	FG					0.1					
Daucus glochidiatus	0.1	5	FG					0.1					
Vittadinia cuneata	0.1	1	FG					0.1					
*Hypochaeris radicata**	0.2	10	EX								0.2		
Calotis hispidula	0.1	5	FG					0.1					
*Sonchus oleraceus**	0.1	5	EX								0.1		

Easting	343236
Northing	6113453
Orientation	95
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

VNI_DR89

Date	19/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR89		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	44		30	25	0	4	5	16	0	0	5	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	64.1	63.3	0	5.1	52.2	6	0	0	0.8	0	
Austrostipa scabra subsp. scabra	40	1000	GG				40						
Austrostipa elegantissima	0.2	5	GG				0.2						
Rytidosperma caespitosum	10	400	GG				10						
Enteropogon acicularis	1	50	GG				1						
Maireana aphylla	1	5	SG			1							
Chrysocephalum apiculatum	3	50	FG					3					
*Medicago laciniata**	0.4	200	EX								0.4		
Crassula sieberiana	0.1	100	FG					0.1					
*Romulea minutiflora**	0.1	30	EX								0.1		
Maireana pentagona	1	50	FG					1					
Maireana humillima	2	100	SG			2							
Goodenia pinnatifida	0.4	20	FG					0.4					
Hyalosperma glutinosum subsp. glutinc	0.4	100	FG					0.4					
Sclerolaena diacantha	2	100	SG			2							
Swainsona murrayana	0.1	5	FG					0.1					
*Vulpia myuros**	0.1	20	EX								0.1		
Rhodanthe corymbiflora	0.1	10	FG					0.1					
Wurmbea dioica subsp. dioica	0.1	5	FG					0.1					
Sida trichopoda	0.1	5	FG					0.1					
Brachyscome lineariloba	0.1	5	FG					0.1					
*Lolium perenne**	0.1	10	EX								0.1		
Teucrium racemosum	0.1	5	FG					0.1					
Bulbine bulbosa	0.1	5	FG					0.1					
Daucus glochidiatus	0.1	5	FG					0.1					
Plantago turrifera	0.1	5	FG					0.1					
Calandrinia eremaea	0.1	5	FG					0.1					
*Avena barbata**	0.1	10	EX								0.1		
Rytidosperma setaceum	1	30	GG				1						
Abutilon halophilum	0.1	5	SG			0.1							
Vittadinia cuneata var. cuneata	0.1	5	FG					0.1					

Easting	324274
Northing	6112395
Orientation	119
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

VNI_DR99

Date	22/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR99		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	44		18	14	0	1	3	10	0	0	4	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	49.5	47.6	0	1	40	6.6	0	0	1.9	0	
Rytidosperma setaceum	35	2000	GG				35						
Podolepis muelleri	1	2000	FG					1					
Maireana pentagona	2	3000	FG					2					
*Hordeum leporinum**	0.5	20	EX								0.5		
Sporobolus caroli	2	1000	GG				2						
Daucus glochidiatus	0.2	2000	FG					0.2					
Brachyscome lineariloba	0.2	1000	FG					0.2					
Cressa australis	0.8	500	FG					0.8					
Rhodanthe corymbiflora	0.1	20	FG					0.1					
*Vulpia myuros**	1	500	EX								1		
*Medicago sp.**	0.1	50	EX								0.1		
Minuria cunninghamii	2	40	FG					2					
*Lolium perenne**	0.3	50	EX								0.3		
Plantago turrifera	0.1	20	FG					0.1					
Calocephalus sonderi	0.1	10	FG					0.1					
Rytidosperma caespitosum	3	200	GG				3						
Maireana aphylla	1	1	SG			1							
Goodenia fascicularis	0.1	20	FG					0.1					

Easting	298635
Northing	6113906
Orientation	210
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

VNI_DR100

Date	23/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR100		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	44		27	23	0	7	2	14	0	0	4	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	44.3	42.1	0	3.4	20.1	18.6	0	0	2.2	0	
Austrostipa scabra subsp. scabra	0.1	30	GG				0.1						
Rytidosperma setaceum	20	3000	GG				20						
Hyalosperma glutinosum subsp. glutinc	10	9000	FG					10					
Eriochlamys behrii	5	6000	FG					5					
Salsola australis	1	40	SG			1							
Sida corrugata	0.5	30	FG					0.5					
Goodenia fascicularis	0.2	20	FG					0.2					
Crassula sieberiana	0.1	30	FG					0.1					
Maireana pentagona	2	500	FG					2					
Atriplex semibaccata	0.5	10	SG			0.5							
*Vulpia myuros**	1	200	EX								1		
Maireana humillima	0.7	30	SG			0.7							
*Medicago spp.**	0.1	30	EX								0.1		
*Spergularia rubra**	0.1	5	EX								0.1		
Teucrium racemosum	0.1	5	FG					0.1					
Maireana aphylla	0.4	5	SG			0.4							
Sclerolaena diacantha	0.1	5	SG			0.1							
Chrysocephalum apiculatum	0.1	5	FG					0.1					
Rhagodia spinescens	0.2	2	SG			0.2							
Atriplex leptocarpa	0.5	30	SG			0.5							
Brachyscome lineariloba	0.1	10	FG					0.1					
*Hordeum leporinum**	1	200	EX								1		
Vittadinia cuneata	0.1	5	FG					0.1					
Calocephalus sonderi	0.1	10	FG					0.1					
Plantago turrifera	0.1	5	FG					0.1					
Wurmbea dioica subsp. dioica	0.1	5	FG					0.1					
Rhodanthe corymbiflora	0.1	5	FG					0.1					

Easting	307850
Northing	6113883
Orientation	54
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

D2.18 PCT 46 – Curly Windmill Grass – spear grass – wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion (Moderate_good)

VNI_DR10

Date	4/02/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR10		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	46		0	20	0	4	6	9	0	1	2	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	0	72.5	0	1.6	68.6	2.2	0	0.1	0.2	0	
Enteropogon acicularis	60	1000	GG				60						
Austrostipa scabra subsp. *scabra*	5	100	GG				5						
Rytidosperma caespitosum	1	100	GG				1						
*Avena sp.**	0.1	5	EX								0.1		
Panicum decompositum	1	20	GG				1						
Sida trichopoda	0.3	30	FG					0.3					
Sclerolaena muricata var. *semiglabr*	0.1	2	SG			0.1							
Leiocarpa websteri	0.2	5	FG					0.2					
Asperula conferta	0.1	20	FG					0.1					
Euphorbia drummondii	0.1	20	FG					0.1					
Einadia nutans	1	20	FG					1					
Maireana aphylla	0.2	1	SG			0.2							
Oxalis perennans	0.1	5	FG					0.1					
Sporobolus caroli	1	20	GG				1						
Solanum esuriale	0.2	20	FG					0.2					
Convolvulus erubescens	0.1	10	OG							0.1			
Maireana decalvans	0.3	5	SG			0.3							
Atriplex semibaccata	1	10	SG			1							
Rytidosperma setaceum	0.6	20	GG				0.6						
Vittadinia cuneata	0.1	10	FG					0.1					
*Sonchus oleraceus**	0.1	5	EX								0.1		
Calotis scabiosifolia var. *scabiosifoli*	0.1	5	FG					0.1					

Easting	335973
Northing	6111071
Orientation	285
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_DR64

Date	29/08/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR64		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	46		25	20	0	5	4	11	0	0	5	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	79.3	61.1	0	2.5	55.2	3.4	0	0	18.2	0	
Sporobolus caroli	25	200	GG				25						
Enteropogon acicularis	15	100	GG				15						
*Medicago laciniata**	2	2000	EX								2		
Calotis scabiosifolia var. scabiosifolia	1	100	FG					1					
Erodium crinitum	1	200	FG					1					
Rhodanthe corymbiflora	0.4	80	FG					0.4					
Maireana excavata	0.2	20	SG			0.2							
Oxalis perennans	0.2	100	FG					0.2					
*Lolium perenne**	15	200	EX								15		
Plantago turrifera	0.1	10	FG					0.1					
Sida trichopoda	0.1	5	FG					0.1					
Leiocarpa panaetioides	0.2	5	FG					0.2					
Austrostipa scabra subsp. scabra	0.2	10	GG				0.2						
Rytidosperma caespitosum	15	100	GG				15						
Tricoryne elatior	0.1	5	FG					0.1					
Atriplex semibaccata	1	5	SG			1							
Sclerolaena muricata var. muricata	1	5	SG			1							
Maireana pentagona	0.1	5	FG					0.1					
Goodenia pusilliflora	0.1	20	FG					0.1					
Sclerolaena stelligera	0.1	1	SG			0.1							
*Sonchus oleraceus**	0.1	5	EX								0.1		
Vittadinia cuneata	0.1	5	FG					0.1					
*Erodium cicutarium**	0.1	5	EX								0.1		
Maireana aphylla	0.2	1	SG			0.2							
*Avena sp.**	1	50	EX								1		

Easting	341338
Northing	6112700
Orientation	215
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

VNI_DR88

Date	19/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR88		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	46		15	12	0	3	5	4	0	0	3	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	73.4	56.4	0	2.7	51.8	1.9	0	0	17	0	
Enteropogon acicularis	10	200	GG				10						
Walwhalleya proluta	35	500	GG				35						
Rytidosperma caespitosum	5	100	GG				5						
*Avena barbata**	1	60	EX								1		
Rhodanthe corymbiflora	0.8	100	FG					0.8					
*Lolium perenne**	15	2000	EX								15		
*Medicago praecox**	1	1000	EX								1		
Leiocarpa panaetioides	0.3	5	FG					0.3					
Rytidosperma setaceum	0.8	30	GG				0.8						
Atriplex semibaccata	0.4	5	SG			0.4							
Austrostipa scabra subsp. scabra	1	40	GG				1						
Maireana pentagona	0.6	100	FG					0.6					
Maireana aphylla	2	5	SG			2							
Calotis scabiosifolia var. scabiosifolia	0.2	20	FG					0.2					
Sclerolaena muricata var. muricata	0.3	2	SG			0.3							

Easting	337730
Northing	6111463
Orientation	90
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

VNIOZ_11

Date	19/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNIOZ_11		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	46		21	16	0	4	3	9	0	0	5	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	79.4	67.7	0	0.4	65	2.3	0	0	11.7	0	
Enteropogon acicularis	30	1000	GG				30						
Walwhalleya proluta	30	1000	GG				30						
*Lolium perenne**	10	5000	EX								10		
Rytidosperma caespitosum	5	1000	GG				5						
*Avena barbata**	1	200	EX								1		
*Medicago laciniata**	0.5	500	EX								0.5		
Rhodanthe corymbiflora	1	200	FG					1					
Vittadinia cuneata	0.2	50	FG					0.2					
Leiocarpa panaetioides	0.1	5	FG					0.1					
Sclerolaena muricata var. muricata	0.1	5	SG			0.1							
*Sonchus oleraceus**	0.1	20	EX								0.1		
Calotis scabiosifolia var. scabiosifolia	0.5	50	FG					0.5					
Crassula sieberiana	0.1	100	FG					0.1					
Enchylaena tomentosa	0.1	1	SG			0.1							
*Spergularia rubra**	0.1	10	EX								0.1		
Plantago turrifera	0.1	20	FG					0.1					
Oxalis perennans	0.1	100	FG					0.1					
Maireana pentagona	0.1	5	FG					0.1					
Atriplex leptocarpa	0.1	5	SG			0.1							
Atriplex semibaccata	0.1	1	SG			0.1							
Goodenia pinnatifida	0.1	10	FG					0.1					

Easting	340269
Northing	6112367
Orientation	169
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

D2.19 PCT 58 – Black Oak – Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion (Thinned)

VNI_DR24

Date	1/05/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_DR24		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	58		22	22	2	13	2	5	0	0	0	0	
Condition	Thinned		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	41.3	41.3	7	29.9	1.1	3.3	0	0	0	0	
Casuarina pauper	4	7	TG		4								
Alectryon oleifolius subsp. canescens	3	1	TG		3								
Rhagodia spinescens	20	100	SG			20							
Maireana brevifolia	3	20	SG			3							
Atriplex lindleyi	2	100	FG					2					
Sclerolaena diacantha	0.2	20	SG			0.2							
Enteropogon ramosus	1	20	GG				1						
Salsola australis	1	50	SG			1							
Senna artemisioides subsp. coriacea	0.1	1	SG			0.1							
Einadia nutans	1	30	FG					1					
Atriplex leptocarpa	1	40	SG			1							
Spergularia brevifolia	0.1	10	FG					0.1					
Sclerolaena tricuspis	0.1	5	SG			0.1							
Sclerolaena brachyptera	0.8	20	SG			0.8							
Maireana decalvans	0.1	5	SG			0.1							
Enchylaena tomentosa	2	20	SG			2							
Atriplex semibaccata	1	20	SG			1							
Sclerolaena muricata var. muricata	0.4	10	SG			0.4							
Austrostipa scabra subsp. scabra	0.1	5	GG				0.1						
Maireana georgei	0.2	5	SG			0.2							
Vittadinia cuneata	0.1	5	FG					0.1					
Sida corrugata	0.1	1	FG					0.1					

Easting	768816
Northing	6119450
Orientation	210
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	1
30-49	3
20-29	yes
10-19	yes
5-9	no
<5	no
Hollows	0
Length logs (m)	1
Attributes 1x1 plot (%)	
Litter (%)	21

VNI_NM21

Date	13/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_NM021		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	58		20	16	1	6	3	6	0	0	4	0	
Condition	Thinned		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	76.3	55.1	10	21.2	21.1	2.8	0	0	21.2	0	
Casuarina pauper	10	4	TG		10								
Rhodanthe corymbiflora	0.5	100	FG					0.5					
Maireana brevifolia	5	50	SG			5							
Einadia nutans	1	50	FG					1					
Enteropogon acicularis	20	300	GG				20						
Rytidosperma setaceum	1	50	GG				1						
Nitraria billardierei	5	20	SG			5							
Enchylaena tomentosa	10	50	SG			10							
Austrostipa scabra	0.1	20	GG				0.1						
Malacocera tricornis	1	20	SG			1							
Sclerolaena muricata	0.1	10	SG			0.1							
Atriplex lindleyi	1	50	FG					1					
Sclerolaena tricuspis	0.1	1	SG			0.1							

Easting	222343
Northing	6119149
Orientation	76
Plot size	20 X 50
AM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	1
30-49	0
20-29	No
10-19	Yes
5-9	No
<5	No
Hollows	2
Length logs (m)	5
Litter (%)	35

D2.20 PCT 157 – Black Oak – Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion (Moderate_good)

VNI_DR09

Date	3/02/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR09		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	157		20	19	0	5	7	7	0	0	1	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	54.8	54.7	0	23.7	29	2	0	0	0.1	0	
Atriplex vesicaria	15	50	SG			15							
Sporobolus caroli	10	100	GG				10						
Rytidosperma caespitosum	5	50	GG				5						
Rytidosperma setaceum	2	100	GG				2						
Austrostipa scabra	2	50	GG				2						
Chloris truncata	5	100	GG				5						
Enteropogon acicularis	2	30	GG				2						
Sida trichopoda	0.1	20	FG					0.1					
Minuria cunninghamii	0.5	1	FG					0.5					
Panicum decompositum	3	30	GG				3						
Leiocarpa websteri	1	10	FG					1					
Maireana aphylla	5	20	SG			5							
Goodenia heteromera	0.1	10	FG					0.1					
*Sonchus oleraceus**	0.1	5	EX								0.1		
Nitraria billardierei	1	2	SG			1							
Abutilon halophilum	0.7	3	SG			0.7							
Rhagodia spinescens	2	1	SG			2							
Einadia nutans	0.1	1	FG					0.1					
Euphorbia drummondii	0.1	5	FG					0.1					
Teucrium racemosum	0.1	10	FG					0.1					

Easting	295989
Northing	6114185
Orientation	250
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	0
10-19	no
5-9	no
<5	no
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	0

VNI_DR26

Date	1/05/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR26		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	157		13	13	0	6	4	3	0	0	0	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	41.8	41.8	0	33.2	8	0.6	0	0	0	0	
Atriplex vesicaria	25	100	SG			25							
Nitraria billardierei	5	10	SG			5							
Sporobolus caroli	2	20	GG				2						
Rytidosperma caespitosum	2	50	GG				2						
Chloris truncata	3	100	GG				3						
Austrostipa scabra subsp. scabra	1	20	GG				1						
Einadia nutans	0.3	10	FG					0.3					
Enchylaena tomentosa	1	20	SG			1							
Sclerolaena tricuspis	0.1	10	SG			0.1							
Malacocera tricornis	2	20	SG			2							
Sida trichopoda	0.2	20	FG					0.2					
Salsola australis	0.1	10	SG			0.1							
Vittadinia cuneata	0.1	5	FG					0.1					

Easting	230078
Northing	6120647
Orientation	250
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

VNI_DR40

Date	5/05/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR40		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	157		10	10	0	4	4	1	1	0	0	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	63.5	63.5	0	38.4	24	0.1	1	0	0	0	
Atriplex vesicaria	35	100	SG			35							
Maireana aphylla	3	10	SG			3							
Chloris truncata	15	300	GG				15						
Marsilea drummondii	1	100	EG						1				
Sporobolus caroli	5	200	GG				5						
Enteropogon acicularis	1	20	GG				1						
Rytidosperma caespitosum	3	200	GG				3						
Cressa australis	0.1	20	FG					0.1					
Rhagodia spinescens	0.3	1	SG			0.3							
Sclerolaena tricuspis	0.1	2	SG			0.1							

Easting	294740
Northing	6114330
Orientation	215
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

VNI_DR49

Date	6/05/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR49		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	157		11	10	0	2	5	3	0	0	1	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	66.7	66.5	0	40.1	25.2	1.2	0	0	0.2	0	
Atriplex vesicaria	40	100	SG			40							
Sporobolus caroli	15	800	GG				15						
Chloris truncata	5	200	GG				5						
Rytidosperma caespitosum	5	200	GG				5						
Leiocarpa panaetioides	1	40	FG					1					
Sclerolaena tricuspis	0.1	5	SG			0.1							
*Sonchus oleraceus**	0.2	20	EX								0.2		
Euphorbia drummondii	0.1	1	FG					0.1					
Enteropogon acicularis	0.1	5	GG				0.1						
Walwhalleya proluta	0.1	10	GG				0.1						
Einadia nutans	0.1	2	FG					0.1					

Easting	300103
Northing	6113777
Orientation	100
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

VNI_DR52

Date	7/05/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR52		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	157		13	11	0	6	2	3	0	0	2	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	48.4	48.2	0	47.6	0.2	0.4	0	0	0.2	0	
Atriplex vesicaria	45	100	SG			45							
Nitraria billardierei	1	5	SG			1							
Sporobolus caroli	0.1	5	GG				0.1						
Atriplex leptocarpa	0.1	10	SG			0.1							
Rytidosperma caespitosum	0.1	5	GG				0.1						
*Lolium perenne**	0.1	10	EX								0.1		
Sclerolaena tricuspis	0.1	5	SG			0.1							
Maireana aphylla	1	5	SG			1							
Cressa australis	0.2	50	FG					0.2					
*Hordeum leporinum**	0.1	10	EX								0.1		
Malacocera tricornis	0.4	10	SG			0.4							
Maireana pentagona	0.1	50	FG					0.1					
Vittadinia cuneata	0.1	1	FG					0.1					

Easting	234061
Northing	6121375
Orientation	70
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

VNI_MP23

Date	11/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_MP23		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	157		21	14	0	4	2	8	0	0	7	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	67.1	59.3	0	50.3	6	3	0	0	7.8	0	
Atriplex vesicaria	50	500	SG			50							
Rytidosperma caespitosum	5	150	GG				5						
*Hordeum leporinum**	5	250	EX								5		
Rhodanthe corymbiflora	1	200	FG					1					
*Lolium rigidum**	1	150	EX								1		
*Vulpia myuros**	0.1	100	EX								0.1		
*Medicago praecox**	1	150	EX								1		
Pseudognaphalium luteoalbum	0.1	50	FG					0.1					
Rytidosperma carphoides	1	50	GG				1						
Arthropodium minus	0.1	1	FG					0.1					
Plantago turrifera	1	100	FG					1					
*Sonchus oleraceus**	0.1	10	EX								0.1		
Cotula bipinnata	0.5	50	EX								0.5		
Disphyma crassifolium	0.1	1	FG					0.1					
*Medicago sp.**	0.1	1	EX								0.1		
Malacocera tricornis	0.1	1	SG			0.1							
Vittadinia cuneata	0.1	1	FG					0.1					
Sclerolaena tricuspis	0.1	1	SG			0.1							
Calotis scabiosifolia	0.5	25	FG					0.5					
Sclerolaena brachyptera	0.1	10	SG			0.1							
Goodenia spp.	0.1	1	FG					0.1					

Easting	276976
Northing	6120140
Orientation	119
Plot size	20 X 20
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

VNI_NM06

Date	7/09/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_NM06		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	157		26	22	0	3	3	16	0	0	4	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	42.8	34.7	0	12.1	1.2	21.4	0	0	8.1	0	
Atriplex vesicaria	10	50	SG			10							
Minuria cunninghamii	10	100	FG					10					
*Cotula bipinnata**	5	500	EX								5		
Chrysocephalum apiculatum	5	300	FG					5					
Rytidosperma spp.	1	100	GG				1						
*Medicago minima**	1	500	EX								1		
Brachyscome spp.	0.2	100	FG					0.2					
Leiocarpa leptolepis	0.1	20	FG					0.1					
Brachyscome lineariloba	5	300	FG					5					
*Lolium rigidum**	2	500	EX								2		
Rhodanthe pygmaea	0.1	100	FG					0.1					
Nitraria billardierei	2	20	SG			2							
Pogonolepis muelleriana	0.1	100	FG					0.1					
Maireana pentagona	0.1	100	FG					0.1					
Crassula colorata	0.1	100	FG					0.1					
Calandrinia eremaea	0.1	50	FG					0.1					
Sclerochlamys brachyptera	0.1	100	FG					0.1					
Senecio glossanthus	0.1	20	FG					0.1					
Daucus glochidiatus	0.1	20	FG					0.1					
Maireana aphylla	0.1	10	SG			0.1							
Rhodanthe corymbiflora	0.1	20	FG					0.1					
*Vulpia bromoides**	0.1	100	EX								0.1		
Sporobolus caroli	0.1	20	GG				0.1						
Atriplex lindleyi	0.1	10	FG					0.1					
Austrostipa nitida	0.1	10	GG				0.1						
Plantago turrifera	0.1	20	FG					0.1					

Easting	218269
Northing	6117141
Orientation	300
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

D2.21 PCT 159 – Old Man Saltbush shrubland mainly of the semi-arid (warm) climate zone (south western NSW) (Moderate_good)

VNI_DR127

Date	25/09/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR127		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	159		24	17	0	7	3	7	0	0	7	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	32	21.9	0	19.7	0.5	1.7	0	0	10.1	0	
Atriplex nummularia	10	10	SG			10							
Maireana aphylla	1	10	SG			1							
Atriplex vesicaria subsp. *vesicaria*	5	20	SG			5							
Podolepis muelleri	1	300	FG					1					
*Medicago spp.**	2	1000	EX								2		
*Vulpia myuros**	2	1000	EX								2		
Rhodanthe corymbiflora	0.2	20	FG					0.2					
Hyalosperma spp.	0.1	20	FG					0.1					
Crassula sieberiana	0.1	100	FG					0.1					
Sida corrugata	0.1	5	FG					0.1					
Cotula bipinnata	1	500	EX								1		
*Hordeum leporinum**	1	300	EX								1		
Malacocera tricornis	0.5	20	SG			0.5							
Enchylaena tomentosa	2	20	SG			2							
*Lolium perenne**	1	80	EX								1		
Sonchus oleraceus	0.1	5	EX								0.1		
Austrostipa scabra subsp. *scabra*	0.1	5	GG				0.1						
Bromus hordeaceus	3	400	EX								3		
Maireana pentagona	0.1	20	FG					0.1					
Maireana georgei	0.2	10	SG			0.2							
Tricoryne elatior	0.1	5	FG					0.1					
Rytidosperma caespitosum	0.1	10	GG				0.1						
Austrostipa elegantissima	0.3	40	GG				0.3						
Rhagodia spinescens	1	5	SG			1							

Easting	271175
Northing	6124992
Orientation	105
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

D2.22 PCT 160 – Nitre Goosefoot shrubland wetland on clays of the inland floodplains (Moderate_good)

VNI_DR12

Date	4/02/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR12		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	160		14	13	0	4	3	5	1	0	1	1	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	38	37.9	0	26.4	10.9	0.5	0.1	0	0.1	0.1	
Chenopodium nitrariaceum	25	15	SG			25							
Eragrostis australasica	10	10	GG				10						
Eleocharis plana	0.8	1000	GG				0.8						
Sclerolaena stelligera	0.2	50	SG			0.2							
Sclerolaena muricata var.	0.2	10	SG			0.2							
Marsilea drummondii	0.1	50	EG						0.1				
Oxalis perennans	0.1	10	FG					0.1					
Atriplex semibaccata	1	5	SG			1							
Euchiton spp.	0.1	5	FG					0.1					
Juncus spp.	0.1	1	GG				0.1						
Vittadinia cuneata	0.1	5	FG					0.1					
Centipeda minima	0.1	20	FG					0.1					
*Xanthium spinosum**	0.1	1	HT									0.1	
Alternanthera sp. A	0.1	10	FG					0.1					

Easting	333611
Northing	6111386
Orientation	200
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_DR35

Date	4/05/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR35		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	160		20	16	0	5	8	2	1	0	4	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	26.6	26.2	0	19.2	1.8	0.2	5	0	0.4	0	
Chenopodium nitrariaceum	7	10	SG			7							
Duma florulenta	2	5	SG			2							
Sclerolaena muricata var. semiglabra	10	50	SG			10							
Marsilea drummondii	5	3000	EG						5				
Enteropogon acicularis	1	20	GG				1						
*Heliotropium europaeum**	0.1	10	EX								0.1		
*Medicago laciniata**	0.1	2000	EX								0.1		
*Lolium perenne**	0.1	500	EX								0.1		
Rytidosperma caespitosum	0.1	200	GG				0.1						
Salsola tragus	0.1	5	SG			0.1							
Juncus flavidus	0.1	1	GG				0.1						
Sporobolus caroli	0.1	10	GG				0.1						
Pycnosorus thompsonianus	0.1	1	FG					0.1					
Chloris truncata	0.2	50	GG				0.2						
Lachnagrostis filiformis	0.1	3	GG				0.1						
Sida corrugata	0.1	5	FG					0.1					
Atriplex semibaccata	0.1	1	SG			0.1							
Austrostipa scabra	0.1	5	GG				0.1						
Walwhalleya proluta	0.1	2	GG				0.1						
*Cirsium vulgare**	0.1	1	EX								0.1		

Easting	304631
Northing	6113814
Orientation	220
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

VNI_DR38

Date	4/05/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR38		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	160		27	23	0	10	6	6	1	0	4	2	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	41.4	39.3	0	34.1	3.8	0.8	0.6	0	2.1	1.8	
Chenopodium nitrariaceum	10	20	SG			10							
Sclerolaena muricata var. semiglabra	10	30	SG			10							
Salsola australis	1	20	SG			1							
*Lycium ferocissimum**	1	1	HT									1	
Nitraria billardierei	5	5	SG			5							
Rytidosperma caespitosum	0.4	20	GG				0.4						
Chloris truncata	0.1	10	GG				0.1						
Maireana aphylla	2	10	SG			2							
Atriplex semibaccata	3	30	SG			3							
*Xanthium spinosum**	0.8	20	HT									0.8	
Sida corrugata	0.1	5	FG					0.1					
Maireana decalvans	0.6	20	SG			0.6							
*Medicago laciniata**	0.1	10	EX								0.1		
Enteropogon acicularis	2	20	GG				2						
Vittadinia cuneata	0.2	20	FG					0.2					
Rhagodia spinescens	1	1	SG			1							
Leiocarpa panaetioides	0.1	5	FG					0.1					
Einadia nutans	0.2	5	FG					0.2					
Sporobolus caroli	0.4	10	GG				0.4						
Sclerolaena tricuspis	0.5	5	SG			0.5							
Solanum esuriale	0.1	5	FG					0.1					
Austrostipa scabra subsp. scabra	0.2	20	GG				0.2						
Marsilea drummondii	0.6	50	EG						0.6				
Duma florulenta	1	1	SG			1							
*Heliotropium europaeum**	0.2	20	EX								0.2		
Euphorbia drummondii	0.1	5	FG					0.1					
Walwhalleya proluta	0.7	10	GG				0.7						

Easting	299607
Northing	6113870
Orientation	195
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

VNI_MP17

Date	10/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_MP17		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	160		6	16	0	5	4	7	0	0	5	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	51.7	42.4	0	37.3	2.7	2.4	0	0	9.3	0	
Nitraria billardierei	30	50	SG			30							
Duma florulenta	7	20	SG			7							
*Lolium rigidum**	2	500	EX								2		
*Medicago praecox**	7	500	EX								7		
*Avena fatua**	0.1	1	EX								0.1		
*Hordeum leporinum**	0.1	1	EX								0.1		
Rhodanthe corymbiflora	0.5	50	FG					0.5					
Bothriochloa macra	0.1	2	GG				0.1						
Rytidosperma caespitosum	0.5	25	GG				0.5						
Oxalis perennans	0.1	20	FG					0.1					
Sporobolus caroli	2	100	GG				2						
Senecio quadridentatus	0.5	25	FG					0.5					
Marsilea drummondii	1	200	FG					1					
Eleocharis pallens	0.1	10	GG				0.1						
Erodium crinitum	0.1	5	FG					0.1					
Sclerolaena stelligera	0.1	1	SG			0.1							
*Sonchus oleraceus**	0.1	5	EX								0.1		
Atriplex leptocarpa	0.1	2	SG			0.1							
Calotis scabiosifolia	0.1	10	FG					0.1					
Alternanthera spp.	0.1	5	FG					0.1					
Sclerolaena muricata	0.1	1	SG			0.1							

Easting	352716
Northing	6116971
Orientation	60
Plot size	20 X 20
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNIOZ_15

Date	22/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNIOZ_15		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	160		21	15	0	6	1	7	1	0	6	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	97.4	50.2	0	27.4	22	0.7	0.1	0	47.2	0	
Chenopodium nitrariaceum	25	30	SG			25							
Rytidosperma caespitosum	22	2000	GG				22						
*Lolium perenne**	22	5000	EX								22		
*Vulpia myuros**	22	6000	EX								22		
*Medicago praecox**	1	1000	EX								1		
Rhodanthe corymbiflora	0.1	10	FG					0.1					
Sclerolaena stelligera	0.2	15	SG			0.2							
Sclerolaena tricuspis	1	5	SG			1							
Sclerolaena muricata var. semiglabra	1	10	SG			1							
Oxalis perennans	0.1	10	FG					0.1					
Einadia nutans	0.1	10	FG					0.1					
Enchylaena tomentosa	0.1	1	SG			0.1							
Atriplex leptocarpa	0.1	1	SG			0.1							
*Sisymbrium erysimoides**	0.1	30	EX								0.1		
*Sonchus oleraceus**	0.1	2	EX								0.1		
Cressa australis	0.1	2	FG					0.1					
Marsilea drummondii	0.1	10	EG						0.1				
Plantago cunninghamii	0.1	10	FG					0.1					
Calocephalus sonderi	0.1	2	FG					0.1					
Brachyscome lineariloba	0.1	5	FG					0.1					
*Hordeum leporinum**	2	500	EX								2		

Easting	299015
Northing	6113968
Orientation	153
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

VNI_OZ31

Date	28/10/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Plot Name	VNI_OZ31		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
PCT	160		25	21	1	8	8	4	0	0	4	0
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
Species	Cover	Abundance	61.3	35.3	0.1	30.6	4.2	0.4	0	0	26	0
Chenopodium nitrariaceum	15	30	SG			15						
Duma florulenta	10	30	SG			10						
Sclerolaena muricata	5	50	SG			5						
Acacia pendula	0.1	1	TG		0.1							
Lolium perenne	15	5000	EX								15	
Medicago praecox	2	100	EX								2	
Rytidosperma setaceum	0.5	20	GG				0.5					
Walwhalleya proluta	3	30	GG				3					
Rhodanthe corymbiflora	0.1	5	FG					0.1				
Hordeum leporinum	1	50	EX								1	
Medicago laciniata	8	500	EX								8	
Atriplex semibaccata	0.2	20	SG			0.2						
Juncus flavidus	0.1	10	GG				0.1					
Eleocharis spp.	0.1	100	GG				0.1					
Juncus spp.	0.1	10	GG				0.1					
Maireana decalvans	0.1	1	SG			0.1						
Rytidosperma spp.	0.1	1	GG				0.1					
Sclerolaena stelligera	0.1	10	SG			0.1						
Austrostipa aristiglumis	0.2	2	GG				0.2					
Atriplex leptocarpa	0.1	3	SG			0.1						
Erodium cicutarium	0.1	1	FG					0.1				
Einadia nutans	0.1	2	FG					0.1				
Salsola australis	0.1	1	SG			0.1						
Enteropogon acicularis	0.1	2	GG				0.1					
Vittadinia cuneata	0.1	1	FG					0.1				

Easting	-35.05625167
Northing	145.8040367
Orientation	94
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

D2.23 PCT 163 – Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones (Moderate_good)

VNI_NM07

Date	7/09/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	at	54
Plot Name	VNI_NM07		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	163		27	22	0	4	4	14	0	0	5	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	51.6	38.3	0	16	5	17.3	0	0	13.3	0	
*Medicago minima**	2	100	EX								2		
Rhodanthe corymbiflora	5	500	FG					5					
Nitraria billardierei	5	50	SG			5							
*Erodium cicutarium**	1	20	EX								1		
Senecio glossanthus	1	100	FG					1					
Malacocera tricornis	5	50	SG			5							
Plantago turrifera	2	200	FG					2					
*Lolium rigidum**	10	1000	EX								10		
Leiocarpa leptolepis	2	30	FG					2					
Einadia nutans	0.1	20	FG					0.1					
*Hordeum leporinum**	0.2	50	EX								0.2		
Crassula colorata	0.1	100	FG					0.1					
Daucus glochidiatus	0.1	20	FG					0.1					
Rytidosperma spp.	2	50	GG				2						
Brachyscome lineariloba	1	50	FG					1					
*Sonchus oleraceus**	0.1	20	EX								0.1		
Sclerolaena tricuspis	5	50	SG			5							
Leontodon rhagalioloides	1	10	FG					1					
Sporobolus caroli	1	50	GG				1						
Geranium retrorsum	1	50	FG					1					
Sclerochlamys brachyptera	1	50	FG					1					
Calotis scabiosifolia	1	50	FG					1					
Atriplex lindleyi	1	10	FG					1					
Maireana aphylla	1	10	SG			1							
Enteropogon ramosus	1	10	GG				1						
Ranunculus pentandrus	1	10	FG					1					
Walwhalleya proluta	1	10	GG				1						

Easting	218360
Northing	6117181
Orientation	284
Plot size	20 X 20
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
BAM Attributes 1x1 plot (%)	
Litter (%)	N/A

VNIOZ_14

Date	22/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNIOZ_14		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	163		22	16	0	3	1	12	0	0	6	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	54.4	47.8	0	25.4	15	7.4	0	0	6.6	0	
Nitraria billardierei	25	14	SG			25							
Rytidosperma caespitosum	15	6000	GG				15						
*Cotula bipinnata**	0.2	200	EX								0.2		
*Hordeum leporinum**	5	3000	EX								5		
Daucus glochidiatus	0.1	100	FG					0.1					
Minuria cunninghamii	5	100	FG					5					
Podolepis muelleri	0.5	500	FG					0.5					
Triptilodiscus pygmaeus	0.1	500	FG					0.1					
Maireana pentagona	1	500	FG					1					
*Medicago minima**	0.1	20	EX								0.1		
Rhodanthe corymbiflora	0.1	5	FG					0.1					
Plantago turrifera	0.1	30	FG					0.1					
Crassula sieberiana	0.1	100	FG					0.1					
*Lolium perenne**	0.2	200	EX								0.2		
Brachyscome lineariloba	0.1	200	FG					0.1					
Einadia nutans	0.1	2	FG					0.1					
Sclerolaena muricata var. semiglabra	0.2	2	SG			0.2							
Erodium crinitum	0.1	1	FG					0.1					
*Vulpia myuros**	1	500	EX								1		
Goodenia spp.	0.1	10	FG					0.1					
*Medicago laciniata**	0.1	50	EX								0.1		
Maireana aphylla	0.2	1	SG			0.2							

Easting	297692
Northing	6113986
Orientation	137
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

VNI_DR13

Date	4/02/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR13		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	163		22	17	0	5	5	6	0	1	5	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	49.2	47.6	0	42.1	4	1.4	0	0.1	1.6	0	
Nitraria billardierei	25	20	SG			25							
Sclerolaena muricata var. *muricata*	15	20	SG			15							
Austrostipa scabra subsp. *scabra*	2	200	GG				2						
Enteropogon acicularis	0.6	20	GG				0.6						
Sida trichopoda	0.4	40	FG					0.4					
Panicum decompositum	0.8	20	GG				0.8						
*Heliotropium europaeum**	1	50	EX								1		
Atriplex semibaccata	1	20	SG			1							
*Marrubium vulgare**	0.3	5	EX								0.3		
Rytidosperma setaceum	0.2	20	GG				0.2						
*Sonchus oleraceus**	0.1	5	EX								0.1		
*Medicago sp.**	0.1	5	EX								0.1		
Euphorbia drummondii	0.1	10	FG					0.1					
Leiocarpa websteri	0.1	1	FG					0.1					
Convolvulus graminetinus	0.1	5	OG							0.1			
Vittadinia cuneata	0.1	5	FG					0.1					
Sporobolus caroli	0.4	20	GG				0.4						
Einadia nutans	0.6	10	FG					0.6					
Atriplex leptocarpa	0.1	5	SG			0.1							
Solanum esuriale	0.1	10	FG					0.1					
Maireana aphylla	1	5	SG			1							
*Avena sp.**	0.1	5	EX								0.1		

Easting	332184
Northing	6111447
Orientation	220
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_DR25

Date	1/05/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_DR25		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	163		12	12	0	5	5	2	0	0	0	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	15.4	15.4	0	11.3	2.8	1.3	0	0	0	0	
Nitraria billardierei	10	20	SG			10							
Sclerolaena diacantha	0.2	50	SG			0.2							
Maireana pentagona	0.3	100	FG					0.3					
Rytidosperma setaceum	0.2	20	GG				0.2						
Malacocera tricornis	0.2	20	SG			0.2							
Sporobolus caroli	1	30	GG				1						
Enteropogon ramosus	1	20	GG				1						
Sclerolaena tricuspis	0.7	10	SG			0.7							
Chloris truncata	0.4	10	GG				0.4						
Atriplex lindleyi	1	20	FG					1					
Atriplex pseudocampanulata	0.2	20	SG			0.2							
Rytidosperma caespitosum	0.2	10	GG				0.2						

Easting	770585
Northing	6119900
Orientation	45
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

VNI_DR39

Date	4/05/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR39		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	163		10	10	0	5	3	2	0	0	0	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	69.8	69.8	0	7.4	62	0.4	0	0	0	0	
Nitraria billardierei	6	5	SG			6							
Maireana aphylla	1	5	SG			1							
Rytidosperma caespitosum	35	200	GG				35						
Sporobolus caroli	25	300	GG				25						
Chloris truncata	2	100	GG				2						
Maireana pentagona	0.3	100	FG					0.3					
Sclerolaena tricuspis	0.1	5	SG			0.1							
Sclerolaena muricata var. semiglabra	0.2	5	SG			0.2							
Einadia nutans	0.1	5	FG					0.1					
Sclerolaena brachyptera	0.1	5	SG			0.1							

Easting	296576
Northing	6114123
Orientation	150
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

VNI_DR50

Date	7/05/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR50		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	163		13	13	0	9	2	2	0	0	0	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	33.5	33.5	0	33.1	0.2	0.2	0	0	0	0	
Maireana aphylla	10	30	SG			10							
Nitraria billardierei	20	20	SG			20							
Malacocera tricornis	2	100	SG			2							
Atriplex leptocarpa	0.3	100	SG			0.3							
Sclerolaena brachyptera	0.1	50	SG			0.1							
Sclerolaena tricuspis	0.2	100	SG			0.2							
Rytidosperma caespitosum	0.1	10	GG				0.1						
Rhagodia spinescens	0.1	1	SG			0.1							
Einadia nutans	0.1	5	FG					0.1					
Maireana decalvans	0.1	10	SG			0.1							
Maireana pentagona	0.1	50	FG					0.1					
Sporobolus caroli	0.1	5	GG				0.1						
Atriplex pseudocampanulata	0.3	40	SG			0.3							

Easting	236282
Northing	6121816
Orientation	350
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

VNI_DR51

Date	7/05/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR51		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	163		22	18	0	10	3	4	1	0	4	1	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	34.1	33.7	0	32.8	0.4	0.4	0.1	0	0.4	0.1	
Nitraria billardierei	20	30	SG			20							
Maireana aphylla	10	30	SG			10							
Sclerolaena tricuspis	1	50	SG			1							
Atriplex pseudocampanulata	0.2	10	SG			0.2							
Malacocera tricornis	1	50	SG			1							
Rytidosperma caespitosum	0.2	80	GG				0.2						
Einadia nutans	0.1	20	FG					0.1					
Sclerolaena stelligera	0.1	3	SG			0.1							
Atriplex leptocarpa	0.1	3	SG			0.1							
Atriplex vesicaria	0.1	5	SG			0.1							
*Xanthium spinosum**	0.1	1	HT									0.1	
Sporobolus caroli	0.1	10	GG				0.1						
Vittadinia cuneata	0.1	2	FG					0.1					
*Spergularia rubra**	0.1	1	EX								0.1		
Rhagodia spinescens	0.2	2	SG			0.2							
*Hordeum leporinum**	0.1	5	EX								0.1		
Marsilea drummondii	0.1	500	EG						0.1				
Maireana pentagona	0.1	20	FG					0.1					
*Lolium perenne**	0.1	3	EX								0.1		
Chloris truncata	0.1	5	GG				0.1						
Sida trichopoda	0.1	3	FG					0.1					
Sclerolaena brachyptera	0.1	1	SG			0.1							

Easting	235188
Northing	6121642
Orientation	30
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

VNI_DR106

Date	24/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR106		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	163		35	25	0	11	4	9	1	0	10	1	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	63.9	60.5	0	23.4	31.2	5.8	0.1	0	3.4	0.2	
Nitraria billardierei	15	30	SG			15							
Rytidosperma caespitosum	20	3000	GG				20						
Rytidosperma setaceum	10	2000	GG				10						
Rhodanthe corymbiflora	1	400	FG					1					
Rhagodia spinescens	2	10	SG			2							
Maireana pentagona	1	200	FG					1					
Podolepis muelleri	0.4	50	FG					0.4					
*Medicago praecox**	0.4	300	EX								0.4		
Rhodanthe pygmaea	0.1	50	FG					0.1					
Plantago turrifera	0.1	20	FG					0.1					
Enchylaena tomentosa	1	20	SG			1							
*Sonchus oleraceus**	0.1	10	EX								0.1		
*Lolium perenne**	1	50	EX								1		
*Medicago laciniata**	0.6	70	EX								0.6		
Minuria cunninghamii	2	30	FG					2					
Austrostipa scabra subsp. scabra	1	50	GG				1						
Malacocera tricornis	2	30	SG			2							
Sclerolaena brachyptera	0.8	20	SG			0.8							
Crassula sieberiana	0.1	50	FG					0.1					
Atriplex leptocarpa	0.1	20	SG			0.1							
*Vulpia myuros**	0.4	40	EX								0.4		
Einadia nutans subsp. nutans	1	20	FG					1					
Sporobolus caroli	0.2	20	GG				0.2						
Maireana aphylla	1	20	SG			1							
Atriplex vesicaria	1	5	SG			1							
Marsilea drummondii	0.1	20	EG						0.1				
*Lycium ferocissimum**	0.2	1	HT									0.2	
*Cotula bipinnata**	0.1	30	EX								0.1		
Atriplex semibaccata	0.3	10	SG			0.3							
Sclerolaena stelligera	0.1	5	SG			0.1							
*Erodium cicutarium**	0.2	30	EX								0.2		
Sida trichopoda	0.1	10	FG					0.1					
Sclerolaena tricuspis	0.1	1	SG			0.1							
*Hordeum leporinum**	0.2	20	EX								0.2		

Easting	264589
Northing	6126864
Orientation	350
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

D2.24 PCT 164 – Cotton Bush open shrubland of the semi-arid (warm) zone (Moderate_good)

VNI_DR11

Date	4/02/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR11		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	164		12	12	0	3	5	4	0	0	0	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	63	63	0	45.3	15.4	2.3	0	0	0	0	
Maireana aphylla	45	60	SG			45							
Enteropogon acicularis	10	300	GG				10						
Sporobolus caroli	2	50	GG				2						
Rytidosperma caespitosum	1	50	GG				1						
Rytidosperma setaceum	2	100	GG				2						
Maireana pentagona	2	500	FG					2					
Atriplex semibaccata	0.2	1	SG			0.2							
Solanum esuriale	0.1	10	FG					0.1					
Sida trichopoda	0.1	5	FG					0.1					
Einadia nutans	0.1	5	FG					0.1					
Chloris truncata	0.4	20	GG				0.4						
Atriplex leptocarpa	0.1	5	SG			0.1							

Easting	334390
Northing	6111299
Orientation	185
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_DR31

Date	3/05/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR31		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	164		12	12	0	2	6	4	0	0	0	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	58.5	58.5	0	55.2	2.9	0.4	0	0	0	0	
Maireana aphylla	55	100	SG			55							
Rytidosperma caespitosum	1	50	GG				1						
Sclerolaena muricata var. semiglabra	0.2	2	SG			0.2							
Enteropogon acicularis	1	20	GG				1						
Walwhalleya proluta	0.4	10	GG				0.4						
Einadia nutans	0.1	5	FG					0.1					
Solanum esuriale	0.1	5	FG					0.1					
Rytidosperma setaceum	0.2	10	GG				0.2						
Maireana pentagona	0.1	10	FG					0.1					
Austrostipa scabra subsp. scabra	0.1	5	GG				0.1						
Sporobolus caroli	0.2	10	GG				0.2						
Pycnosorus thompsonianus	0.1	5	FG					0.1					

Easting	313445
Northing	6114111
Orientation	85
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

VNI_DR33

Date	3/05/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR33		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	164		15	14	0	1	6	7	0	0	1	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	58	57.9	0	40	16.9	1	0	0	0.1	0	
Maireana aphylla	40	100	SG			40							
Rytidosperma caespitosum	15	200	GG				15						
Sporobolus caroli	0.5	50	GG				0.5						
Enteropogon acicularis	0.2	5	GG				0.2						
Teucrium racemosum	0.1	5	FG					0.1					
*Medicago laciniata**	0.1	10	EX								0.1		
Calocephalus sonderi	0.1	5	FG					0.1					
Einadia nutans	0.1	5	FG					0.1					
Leiocarpa panaetioides	0.4	10	FG					0.4					
Chloris truncata	0.6	20	GG				0.6						
Sida trichopoda	0.1	5	FG					0.1					
Goodenia pinnatifida	0.1	10	FG					0.1					
Juncus usitatus	0.4	10	GG				0.4						
Solanum esuriale	0.1	10	FG					0.1					
Austrostipa scabra subsp. scabra	0.2	10	GG				0.2						

Easting	319405
Northing	6113443
Orientation	60
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

VNI_DR37

Date	4/05/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR37		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	164		19	19	0	6	7	5	1	0	0	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	49.8	49.8	0	36.5	12.3	0.9	0.1	0	0	0	
Maireana aphylla	35	40	SG			35							
Enteropogon acicularis	5	30	GG				5						
Rytidosperma caespitosum	5	50	GG				5						
Eragrostis parviflora	0.3	10	GG				0.3						
Chloris truncata	0.7	20	GG				0.7						
Chenopodium nitrariaceum	0.4	1	SG			0.4							
Nitraria billardierei	0.6	2	SG			0.6							
Austrostipa scabra subsp. scabra	1	40	GG				1						
Eriochlamys behrii	0.2	50	FG					0.2					
Leiocarpa panaetioides	0.3	10	FG					0.3					
Chrysocephalum apiculatum	0.1	1	FG					0.1					
Scleroloaena muricata var. semiglabra	0.3	5	SG			0.3							
Marsilea drummondii	0.1	50	EG						0.1				
Juncus usitatus	0.1	5	GG				0.1						
Maireana pentagona	0.2	100	FG					0.2					
Alternanthera nana	0.1	10	FG					0.1					
Maireana cheelii	0.1	20	SG			0.1							
Scleroloaena tricuspis	0.1	1	SG			0.1							
Sporobolus caroli	0.2	40	GG				0.2						

Easting	301346
Northing	6113782
Orientation	205
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

VNI_MP03

Date	29/08/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_MP03		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	164		20	16	0	2	5	9	0	0	4	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	68	64.8	0	30.1	31.2	3.5	0	0	3.2	0	
Swainsona procumbens	0.1	7	FG					0.1					
Maireana aphylla	30	35	SG			30							
Rytidosperma caespitosum	25	40	GG				25						
*Lolium perenne**	2	500	EX								2		
*Medicago praecox**	1	50	EX								1		
Daucus glochidiatus	0.1	50	FG					0.1					
Calotis scabiosofolia	1	100	FG					1					
Goodenia spp.	0.5	100	FG					0.5					
*Moraea setifolia**	0.1	1	EX								0.1		
Leucochrysum molle	1	150	FG					1					
Sporobous caroli	0.1	1	GG				0.1						
Crassula sieberiana	0.5	100	FG					0.5					
Einadia nutans	0.1	3	FG					0.1					
Tricoryne elatior	0.1	1	FG					0.1					
Austrostipa scabra	0.1	5	GG				0.1						
Chloris truncata	1	2	GG				1						
Enteropogon acicularis	5	50	GG				5						
*Sonchus oleraceus**	0.1	3	EX								0.1		
Vittadinia cuneata	0.1	10	FG					0.1					
Rhagodia spinescens	0.1	2	SG			0.1							

Easting	309818
Northing	6113910
Orientation	112
Plot size	20x20
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_MP04

Date	1/09/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_MP04		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	164		25	20	0	1	6	13	0	0	5	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	54.1	50.2	0	25	16.7	8.5	0	0	3.9	0	
Maireana aphylla	25	100	SG			25							
Enteropogon acicularis	5	50	GG				5						
*Lolium perenne**	3	100	EX								3		
Rytidosperma caespitosum	10	100	GG				10						
Sporobous caroli	0.1	1	GG				0.1						
maireana ciliata	1	500	FG					1					
Podolepis muelleri	5	500	FG					5					
Goodenia pusilliflora	0.5	100	FG					0.5					
Rhodanthe corymbiflora	0.5	50	FG					0.5					
Crassula sieberiana	0.2	500	FG					0.2					
Plantago turrifera	0.5	100	FG					0.5					
*Vulpia myuros**	0.2	50	EX								0.2		
Austrostipa scabra	0.5	5	GG				0.5						
Swainsona murrayana	0.2	20	FG					0.2					
Daucus glochidiatus	0.1	50	FG					0.1					
*Medicago praecox**	0.5	200	EX								0.5		
*Sonchus oleraceus**	0.1	5	EX								0.1		
Rytidosperma spp.	1	5	GG				1						
*Cotula australis**	0.1	100	EX								0.1		
Brachyscome lineariloba	0.1	200	FG					0.1					
Calotis hispidula	0.1	50	FG					0.1					
Chloris truncata	0.1	5	GG				0.1						
Goodenia spp.	0.1	10	FG					0.1					
Tricoryne elatior	0.1	5	FG					0.1					
Calotis scabiosifolia var. scabiosifolia	0.1	1	FG					0.1					

Easting	286367
Northing	6116259
Orientation	115
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNIOZ_02

Date	30/08/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNIOZ_02		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	164		22	14	0	3	3	8	0	0	8	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	78.3	65.6	0	40.2	17.2	8.2	0	0	12.7	0	
Maireana aphylla	40	100	SG			40							
Austrostipa scabra	15	500	GG				15						
*Vulpia myuros**	5	2000	EX								5		
Enteropogon acicularis	2	50	GG				2						
*Heliotropium europaeum**	2	100	EX								2		
*Medicago sp.**	5	2000	EX								5		
Cotula australis	2	1000	FG					2					
Oxalis perennans	2	500	FG					2					
Crassula sieberiana	0.5	1000	FG					0.5					
Goodenia spp.	0.2	100	FG					0.2					
Maireana pentagona	0.2	100	FG					0.2					
Austrostipa nodosa	0.2	50	GG				0.2						
Rhodanthe pygmaea	3	1000	FG					3					
*Arctotheca calendula**	0.1	20	EX								0.1		
*Lolium perenne**	0.2	200	EX								0.2		
*Hypochaeris radicata**	0.1	100	EX								0.1		
*Erodium cicutarium**	0.1	50	EX								0.1		
Calotis hispidula	0.1	200	FG					0.1					
Sclerolaena tricuspis	0.1	2	SG			0.1							
*Hordeum leporinum**	0.2	200	EX								0.2		
Sida intricata	0.1	2	SG			0.1							
Goodenia spp.	0.2	100	FG					0.2					

Easting	291636
Northing	6115030
Orientation	70
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

VNIOZ_04

Plot Name	VNIOZ_04		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
PCT	164		29	22	0	9	3	10	0	0	7	0
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
Species	Cover	Abundance	66.9	62.9	0	50.5	5.2	7.2	0	0	4	0
Maireana aphylla	40	200	SG			40						
Atriplex vesicaria	2	50	SG			2						
Malacocera tricornis	2	50	SG			2						
Rhodanthe corymbiflora	0.8	1000	FG					0.8				
*Medicago praecox**	0.6	1000	EX								0.6	
*Erodium cicutarium**	0.1	10	EX								0.1	
*Sonchus oleraceus**	0.1	10	EX								0.1	
Plantago turrifera	0.2	100	FG					0.2				
Brachyscome lineariloba	0.6	1000	FG					0.6				
*Hordeum leporinum**	0.5	1000	EX								0.5	
Crassula sieberiana	0.1	1000	FG					0.1				
Rytidosperma caespitosum	5	800	GG				5					
Enteropogon acicularis	0.1	1	GG				0.1					
Atriplex lindleyi	5	50	FG					5				
*Lolium perenne**	2	500	EX								2	
Nitraria billardierei	1	2	SG			1						
Sporobolus caroli	0.1	5	GG				0.1					
Sclerolaena tricuspis	5	100	SG			5						
Einadia nutans	0.1	10	FG					0.1				
Vittadinia cuneata var. cuneata	0.1	1	FG					0.1				
Sclerolaena stelligera	0.1	1	SG			0.1						
Salsola australis	0.1	1	SG			0.1						
Daucus glochidiatus	0.1	20	FG					0.1				
Maireana pentagona	0.1	5	FG					0.1				
Calotis hispidula	0.1	10	FG					0.1				
*Medicago laciniata**	0.6	1000	EX								0.6	
Sclerolaena brachyptera	0.1	2	SG			0.1						
Rhagodia spinescens	0.2	1	SG			0.2						
*Spergularia rubra**	0.1	10	EX								0.1	

Northing	6121769
Orientation	295
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	N/A

D2.25 PCT 170 – Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones (Derived)

VNI_MP28

Date	13/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_MP28		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	170		9	6	0	3	1	2	0	0	3	0	
Condition	Derived		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	58.7	40.7	0	30.1	10	0.6	0	0	18	0	
*Hordeum leporinum**	15	250	EX								15		
Austrostipa scabra	10	280	GG				10						
*Medicago praecox**	2	250	EX								2		
*Marrubium vulgare**	1	50	EX								1		
Maireana brevifolia	25	50	SG			25							
Enchylaena tomentosa	5	25	SG			5							
Vittadinia cuneata	0.5	100	FG					0.5					
Calotis scabiosifolia	0.1	10	FG					0.1					
Dissocarpus paradoxus	0.1	5	SG			0.1							

Easting	769234
Northing	6119126
Orientation	226
Plot size	20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_MP29

Date	13/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_MP29		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	170		12	6	0	4	1	1	0	0	6	0	
Condition	Derived		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	87.9	42.1	0	41	1	0.1	0	0	45.8	0	
*Hordeum leporinum**	35	250	EX								35		
*Marrubium vulgare**	0.1	10	EX								0.1		
*Medicago praecox**	10	250	EX								10		
Rhagodia spinescens	0.5	5	SG			0.5							
Maireana brevifolia	25	100	SG			25							
*Sisymbrium irio**	0.1	15	EX								0.1		
*Lolium rigidum**	0.1	50	EX								0.1		
Enchylaena tomentosa	15	50	SG			15							
Erodium crinitum	0.1	25	FG					0.1					
Dissocarpus paradoxus	0.5	10	SG			0.5							
*Sonchus oleraceus**	0.5	30	EX								0.5		
Austrostipa scabra	1	100	GG				1						

Easting	769307
Northing	6119317
Orientation	73
Plot size	20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_MP30

Date	13/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
Plot Name	VNI_MP30		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	170		18	11	0	5	2	4	0	0	7	0	
Condition	Derived		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	65.4	41.5	0	12.2	26	3.3	0	0	23.9	0	
Abutilon spp.	0.1	5	FG					0.1					
Solanum esuriale	0.1	25	FG					0.1					
*Medicago praecox**	5	150	EX								5		
Vittadinia cuneata	3	150	FG					3					
Enteropogon acicularis	1	25	GG				1						
Maireana brevifolia	10	25	SG			10							
Maireana spp.	1	10	SG			1							
Dissocarpus paradoxus	0.1	5	SG			0.1							
*Limonium lobatum**	0.1	5	EX								0.1		
*Avena fatua**	0.5	50	EX								0.5		
*Marrubium vulgare**	0.1	5	EX								0.1		
Senna artemisioides	0.1	1	SG			0.1							
Rhagodia spinescens	1	10	SG			1							
*Hordeum leporinum**	18	200	EX								18		
Austrostipa scabra	25	150	GG				25						
*Lactuca serriola**	0.1	5	EX								0.1		
*Sonchus oleraceus**	0.1	10	EX								0.1		
Rhodanthe corymbiflora	0.1	5	FG					0.1					

Easting	222114
Northing	6119016
Orientation	80
Plot size	20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	1.4

D2.26 PCT 170 – Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones (Thinned)

VNI_NM19

Date	13/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54	Easting	221927
Plot Name	VNI_NM019		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count		Northing	6118906
PCT	170		12	9	2	4	0	3	0	0	3	0		Orientation	354
Condition	Thinned		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum		Plot size	20 X 50
Species	Cover	Abundance	71.8	60.8	10.1	45.5	0	5.2	0	0	11	0		Attributes 20x50m plot	
Rhagodia spinescens	20	50	SG			20								Stem classes	
*Schismus barbatus**	5	100	EX								5			80+	0
Maireana brevifolia	5	100	SG			5								50-79	0
Einadia nutans	5	100	FG					5						30-49	0
*Marrubium vulgare**	1	50	EX								1			20-29	2
Enchylaena tomentosa	20	100	SG			20								10-19	0
Salsola tragus	0.5	50	SG			0.5								5-9	0
Vittadinia cuneata	0.1	10	FG					0.1						<5	0
Eucalyptus socialis	10	2	TG		10									Hollows	0
Rhodanthe corymbiflora	0.1	1	FG					0.1						Length logs (m)	0
Alectryon oleifolius	0.1	5	TG		0.1										
*Hordeum leporinum**	5	100	EX								5			Attributes 1x1 plot (%)	
														Litter (%)	25

VNI_NM20

Date	13/10/2024		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55	Easting	222126
Plot Name	VNI_NM020		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count		Northing	6118965
PCT	170		15	10	1	6	0	3	0	0	5	0		Orientation	306
Condition	Thinned		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum		Plot size	20 X 50
Species	Cover	Abundance	82.8	56.6	10	45.4	0	1.2	0	0	26.2	0		Attributes 20x50m plot	
Eucalyptus socialis	10	1	TG		10									Stem classes	
Enchylaena tomentosa	30	50	SG			30								80+	0
Rhagodia spinescens	10	20	SG			10								50-79	0
Einadia nutans	1	50	FG					1						30-49	1
*Hordeum leporinum**	20	500	EX								20			20-29	1
*Medicago praecox**	0.1	50	EX								0.1			10-19	0
*Marrubium vulgare**	1	50	EX								1			5-9	0
*Schismus barbatus**	5	100	EX								5			<5	0
Salsola tragus	0.1	50	SG			0.1								Hollows	3
*Sisymbrium irio**	0.1	10	EX								0.1			Length logs (m)	41
Sclerolaena stelligera	0.1	20	SG			0.1									
Vittadinia spp.	0.1	10	FG					0.1						Attributes 1x1 plot (%)	
Nitraria billardierei	0.2	1	SG			0.2								Litter (%)	25
Atriplex lindleyi	0.1	20	FG					0.1							
Maireana brevifolia	5	100	SG			5									

D2.27 PCT 216 – Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion (Moderate_good)

VNI_OZ26

Date	10/04/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_OZ26		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	216		16	16	0	8	3	5	0	0	0	0	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	43.4	43.4	0	40.7	2.2	0.5	0	0	0	0	
Sclerolaena muricata var. muricata	20	100	SG			20							
Sclerolaena muricata var. semiglabra	20	100	SG			20							
Atriplex semibaccata	0.2	50	SG			0.2							
Sclerolaena stelligera	0.1	20	SG			0.1							
Oxalis perennans	0.1	20	FG					0.1					
Erodium crinitum	0.1	20	FG					0.1					
Enteropogon acicularis	2	500	GG				2						
Sida trichopoda	0.1	100	FG					0.1					
Maireana decalvans	0.1	10	SG			0.1							
Alternanthera nana	0.1	5	FG					0.1					
Walwhalleya proluta	0.1	50	GG				0.1						
Solanum esuriale	0.1	100	FG					0.1					
Rytidosperma spp.	0.1	1	GG				0.1						
Maireana aphylla	0.1	1	SG			0.1							
Enchylaena tomentosa	0.1	1	SG			0.1							
Rhagodia spinescens	0.1	3	SG			0.1							

Easting	356809
Northing	6118331
Orientation	74
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	N/A
50-79	N/A
30-49	N/A
20-29	N/A
10-19	N/A
5-9	N/A
<5	N/A
Hollows	N/A
Length logs (m)	N/A
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_OZ33

Date	29/10/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Plot Name	VNI_OZ33		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
PCT	216		23	19	0	4	5	9	1	0	4	0
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
Species	Cover	Abundance	45.9	18.8	0	15.2	2.5	1	0.1	0	27.1	0
Sclerolaena muricata var. semiglabra	10	40	SG			10						
Duma florulenta	5	10	SG			5						
Lolium perenne	15	3000	EX								15	
Rhodanthe corymbiflora	0.2	20	FG					0.2				
Medicago laciniata	10	5000	EX								10	
Calotis scabiosifolia	0.1	5	FG					0.1				
Eleocharis spp.	0.1	100	GG				0.1					
Enteropogon acicularis	0.2	15	GG				0.2					
Medicago praecox	2	200	EX								2	
Walwhalleya proluta	2	20	GG				2					
Juncus spp.	0.1	2	GG				0.1					
Erodium cicutarium	0.1	1	FG					0.1				
Juncus flavidus	0.1	2	GG				0.1					
Euphorbia drummondii	0.1	5	FG					0.1				
Solanum esuriale	0.1	1	FG					0.1				
Alternanthera nana	0.1	2	FG					0.1				
Atriplex semibaccata	0.1	5	SG			0.1						
Sclerolaena stelligera	0.1	5	SG			0.1						
Hordeum leporinum	0.1	20	EX								0.1	
Rumex brownii	0.1	1	FG					0.1				
Oxalis perennans	0.1	3	FG					0.1				
Polygonum plebeium	0.1	1	FG					0.1				
Marselea drummondii	0.1	1	EG						0.1			

Easting	-35.0585
Northing	145.8197483
Orientation	245
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

D3 Inland Slopes IBRA

D3.1 PCT 266 – White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion (Moderate-good)

VNI_DR108

Date	24/02/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR108		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	266		31	14	2	0	8	4	0	0	17	2	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	46.6	35.1	10.2	0	20.4	4.5	0	0	11.5	1.2	
Eucalyptus albens	10	10	TG		10								
Dysphania pumilio	2	50	FG					2					
*Malva parviflora**	1	20	EX								1		
Panicum effusum	3	10	GG				3						
*Avena spp.**	0.1	5	EX								0.1		
*Polygonum aviculare**	0.4	50	EX								0.4		
*Tribulus terrestris**	0.8	20	EX								0.8		
Xanthium spinosum	0.2	5	HT									0.2	
*Solanum nigrum**	3	20	EX								3		
Einadia nutans	2	40	FG					2					
Paspalidium constrictum	3	30	GG				3						
*Sonchus oleraceus**	0.1	10	EX								0.1		
Bothriochloa macra	3	60	GG				3						
Austrostipa scabra	5	100	GG				5						
Rytidosperma setaceum	5	200	GG				5						
*Lepidium africanum**	0.5	50	EX								0.5		
Portulaca oleracea	0.4	5	FG					0.4					
*Solanum elaeagnifolium**	1	30	HT									1	
*Digitaria sanguinalis**	0.4	10	EX								0.4		
Cucumis myriocarpus subsp. Leptoderm	0.2	10	EX								0.2		
*Cirsium vulgare**	0.2	10	EX								0.2		
*Amaranthus retroflexus**	1	20	EX								1		
*Hordeum leporinum**	0.2	50	EX								0.2		
Chloris truncata	1	50	GG				1						
Rumex brownii	0.1	5	FG					0.1					
Lomandra filiformis subsp. coriacea	0.2	10	GG				0.2						
*Modiola caroliniana**	1	20	EX								1		
Enteropogon acicularis	0.2	5	GG				0.2						
*Eleusine indica**	0.4	10	EX								0.4		
*Setaria parviflora**	1	30	EX								1		
Eucalyptus blakelyi	0.2	1	TG		0.2								

Easting	536616
Northing	6102765
Orientation	164
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	3
50-79	5
30-49	2
20-29	Yes
10-19	No
5-9	Yes
<5	Yes
Hollows	5
Length logs (m)	42
Attributes 1x1 plot (%)	
Litter (%)	39

D3.2 PCT 266 – White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion (Thinned)

VNI_DR110

Date	24/02/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR110		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	266		36	14	2	0	8	4	0	0	22	4	
Condition	Thinned		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	71.3	33.4	6	0	25.2	2.2	0	0	37.9	16.2	
Eucalyptus albens	3	1	TG		3								
Callitris glaucophylla	3	1	TG		3								
Dysphania pumilio	1	50	FG					1					
*Lepidium africanum**	1	100	EX								1		
*Echium plantagineum**	5	100	EX								5		
Portulaca oleracea	1	50	FG					1					
*Malva parviflora**	3	500	EX								3		
Cynodon dactylon	10	500	GG				10						
*Plantago lanceolata**	1	20	EX								1		
*Solanum elaeagnifolium**	5	70	HT									5	
Panicum effusum	5	100	GG				5						
*Cirsium vulgare**	2	20	EX								2		
Eriochloa pseudoacrotricha	3	100	GG				3						
Dactyloctenium radulans	3	100	GG				3						
*Alternanthera pungens**	1	50	HT									1	
*Heliotropium europaeum**	2	50	EX								2		
Euphorbia drummondii	0.1	10	FG					0.1					
Bothriochloa macra	1	40	GG				1						
*Marrubium vulgare**	1	20	EX								1		
*Xanthium spinosum**	10	10	HT									10	
*Echinochloa crus-galli**	3	100	EX								3		
*Rumex crispus**	0.4	20	EX								0.4		
*Sonchus oleraceus**	0.1	10	EX								0.1		
*Hypochaeris radicata**	0.8	30	EX								0.8		
*Modiola caroliniana**	0.2	30	EX								0.2		
*Polygonum aviculare**	0.1	20	EX								0.1		
*Tribulus terrestris**	0.8	20	EX								0.8		
*Setaria parviflora**	1	50	EX								1		
*Hordeum leporinum**	0.1	10	EX								0.1		
Chloris truncata	0.2	10	GG				0.2						
Paspalidium spp.	1	30	GG				1						
*Cyperus eragrostis**	0.2	10	HT									0.2	
Oxalis perennans	0.1	10	FG					0.1					
*Conyza sp.**	0.1	5	EX								0.1		
Enteropogon acicularis	2	30	GG				2						
*Centaurea solstitialis**	0.1	10	EX								0.1		

Easting	536930
Northing	6102731
Orientation	110
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	1
50-79	2
30-49	0
20-29	no
10-19	no
5-9	no
<5	no
Hollows	1
Length logs (m)	2
Attributes 1x1 plot (%)	
Litter (%)	2

D3.3 PCT 277 – Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion (Derived_No Offset)

VNI_DR109

Date	24/02/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR109		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	277		18	11	0	0	7	4	0	0	7	1	
Condition	Derived_No offset		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	64.8	43.4	0	0	41.8	1.6	0	0	21.4	1	
Panicum effusum	15	400	GG				15						
Cynodon dactylon	15	500	GG				15						
*Medicago spp.**	0.1	5	EX								0.1		
*Hypochaeris radicata**	15	1000	EX								15		
Chloris truncata	5	300	GG				5						
Paspalidium constrictum	1	40	GG				1						
Eragrostis elongata	3	50	GG				3						
Erodium crinitum	0.4	30	FG					0.4					
*Echium plantagineum**	5	50	EX								5		
Eragrostis parviflora	0.8	15	GG				0.8						
Bothriochloa macra	2	100	GG				2						
Dysphania pumilio	1	100	FG					1					
Euphorbia drummondii	0.1	10	FG					0.1					
*Acetosa sagittata**	1	40	HT									1	
*Conyza spp.**	0.1	5	EX								0.1		
Portulaca oleracea	0.1	5	FG					0.1					
*Modiola caroliniana**	0.1	5	EX								0.1		
*Cirsium vulgare**	0.1	5	EX								0.1		

Easting	536805
Northing	6102788
Orientation	112
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_DR111

Date	25/02/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR111		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	277		24	10	0	0	7	3	0	0	14	2	
Condition	Derived_No offset		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	58.7	30.7	0	0	28.2	2.5	0	0	28	5.1	
*Digitaria sanguinalis**	5	200	EX								5		
Panicum effusum	10	500	GG				10						
*Hypochaeris radicata**	3	500	EX								3		
Portulaca oleracea	0.4	20	FG					0.4					
*Eragrostis cilianensis**	3	200	EX								3		
Dysphania pumilio	2	20	FG					2					
*Echium plantagineum**	5	100	EX								5		
*Acetosa sagittata**	5	200	HT									5	
*Polygonum aviculare**	0.2	20	EX								0.2		
*Amaranthus retroflexus**	0.3	10	EX								0.3		
*Modiola caroliniana**	5	20	EX								5		
*Avena spp.**	0.1	5	EX								0.1		
*Conyza spp.**	0.1	1	EX								0.1		
Eragrostis parviflora	1	40	GG				1						
Enteropogon acicularis	1	30	GG				1						
Chloris truncata	1	40	GG				1						
*Setaria parviflora**	1	1	EX								1		
Paspalidium distans	10	500	GG				10						
Cynodon dactylon	5	200	GG				5						
*Bromus molliformis**	0.1	5	EX								0.1		
Rumex brownii	0.1	5	FG					0.1					
Juncus spp.	0.2	2	GG				0.2						
*Xanthium spinosum**	0.1	1	HT									0.1	
*Tribulus terrestris**	0.1	1	EX								0.1		

Easting	543141
Northing	6097627
Orientation	293
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_DR113_PL

Date	25/02/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR113_PL		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	277		20	12	0	0	10	2	0	0	8	2	
Condition	Derived_No offset		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	76.4	57.8	0	0	57.6	0.2	0	0	18.6	5	
Panicum effusum	25	1000	GG				25						
Paspalum dilatatum	3	30	HT									3	
*Lolium perenne**	0.4	50	EX								0.4		
*Digitaria sanguinalis**	2	60	EX								2		
Juncus spp.	2	10	GG				2						
*Eragrostis cilianensis**	10	1000	EX								10		
Paspalidium constrictum	2	30	GG				2						
Chloris truncata	3	100	GG				3						
Cynodon dactylon	10	1000	GG				10						
Anthosachne scabra	1	30	GG				1						
Sporobolus creber	3	50	GG				3						
Enteropogon acicularis	10	200	GG				10						
*Hypochaeris radicata**	1	30	EX								1		
*Avena spp.**	0.1	10	EX								0.1		
Rytidosperma caespitosum	0.6	20	GG				0.6						
*Conyza spp.**	0.1	10	EX								0.1		
Portulaca oleracea	0.1	10	FG					0.1					
Dysphania pumilio	0.1	10	FG					0.1					
Eragrostis parviflora	1	20	GG				1						
Acetosa sagittata	2	100	HT									2	

Easting	539780
Northing	6099899
Orientation	135
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_OZ23

Date	27/02/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_OZ23		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	277		17	9	0	0	5	4	0	0	8	1	
Condition	Derived_No offset		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	89.5	82.9	0	0	81.2	1.7	0	0	6.6	0.1	
Cynodon dactylon	75	10000	GG				75						
*Eragrostis cilianensis**	5	500	EX								5		
*Acetosella vulgaris**	0.1	10	HT									0.1	
*Medicago sp.**	0.1	10	EX								0.1		
Austrostipa spp.	0.1	10	GG				0.1						
*Hypochaeris radicata**	0.5	20	EX								0.5		
Eragrostis spp.	0.1	10	GG				0.1						
Juncus spp.	1	3	GG				1						
Dysphania pumilio	1	200	FG					1					
Paspalidium distans	5	200	GG				5						
Portulaca oleracea	0.5	20	FG					0.5					
*Avena barbata**	0.1	5	EX								0.1		
*Echium plantagineum**	0.5	20	EX								0.5		
Oxalis spp.	0.1	10	FG					0.1					
Rumex brownii	0.1	2	FG					0.1					
*Cirsium vulgare**	0.1	1	EX								0.1		
Cucumis myriocarpus subsp myriocarpus*	0.2	1	EX								0.2		

Easting	539333
Northing	6100286
Orientation	272
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

D3.4 PCT 277 – Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion (Thinned)

VNI_DR113

Date	25/02/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR113		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	277		19	9	1	0	6	2	0	0	10	0	
Condition	Thinned		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	74.8	68.2	15	0	51.8	1.4	0	0	6.6	0	
Eucalyptus blakelyi	15	15	TG		15								
Paspalidium constrictum	1	20	GG				1						
*Bromus catharticus**	2	60	EX								2		
*Echium plantagineum**	1	50	EX								1		
*Digitaria sanguinalis**	1	20	EX								1		
*Solanum nigrum**	1	10	EX								1		
Anthosachne scabra	0.4	10	GG				0.4						
Portulaca oleracea	0.6	20	FG					0.6					
*Eleusine indica**	1	30	EX								1		
Pennisetum spp. (native)	10	200	GG				10						
Dysphania pumilio	0.8	20	FG					0.8					
Panicum effusum	5	50	GG				5						
*Marrubium vulgare**	0.1	5	EX								0.1		
*Cirsium vulgare**	0.1	5	EX								0.1		
Cynodon dactylon	35	2000	GG				35						
*Hypochaeris radicata**	0.1	10	EX								0.1		
*Malva parviflora**	0.2	10	EX								0.2		
*Amaranthus retroflexus**	0.1	5	EX								0.1		
Enteropogon acicularis	0.4	10	GG				0.4						

Easting	539777
Northing	6099976
Orientation	95
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	9
50-79	8
30-49	6
20-29	No
10-19	No
5-9	No
<5	No
Hollows	25
Length logs (m)	2
Attributes 1x1 plot (%)	
Litter (%)	49

VNI_OZ19

Date	24/02/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_OZ19		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	277		30	16	2	0	8	6	0	0	14	3	
Condition	Thinned		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	58.9	37.4	8	0	27.1	2.3	0	0	21.5	8	
Eucalyptus melliodora	5	1	TG		5								
Eucalyptus blakelyi	3	2	TG		3								
Panicum effusum	3	300	GG				3						
*Hypochaeris radicata**	5	500	EX								5		
*Acetosella vulgaris**	2	500	HT									2	
Chloris truncata	3	300	GG				3						
*Echium plantagineum**	1	100	EX								1		
Oxalis spp.	0.1	10	FG					0.1					
Eragrostis spp.	2	150	GG				2						
Vittadinia gracilis	0.5	15	FG					0.5					
Austrostipa spp.	3	200	GG				3						
*Vulpia myuros**	0.5	100	EX								0.5		
Portulaca oleracea	0.5	30	FG					0.5					
Rumex brownii	0.1	1	FG					0.1					
Cynodon dactylon	1	200	GG				1						
Dysphania pumilio	1	50	FG					1					
Cucumis myriocarpus subsp myriocarpus*	0.2	1	EX								0.2		
Eragrostis elongata	5	300	GG				5						
*Solanum nigrum**	1	20	EX								1		
*Euphorbia drummondii**	0.1	5	FG					0.1					
*Enteropogon acicularis**	10	500	GG				10						
*Xanthium spinosum**	3	100	HT									3	
*Solanum elaeagnifolium**	3	20	HT									3	
*Tribulus terrestris**	0.5	30	EX								0.5		
*Heliotropium europaeum**	0.2	2	EX								0.2		
*Centaurea solstitialis**	1	20	EX								1		
*Marrubium vulgare**	3	20	EX								3		
*Malva parviflora**	1	50	EX								1		
*Lepidium africanum**	0.1	1	EX								0.1		
Bothriochloa macra	0.1	3	GG				0.1						

Easting	536696
Northing	6102909
Orientation	28
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	1
50-79	1
30-49	1
20-29	No
10-19	No
5-9	No
<5	Yes
Hollows	1
Length logs (m)	1
Attributes 1x1 plot (%)	
Litter (%)	4.8

D3.5 PCT 319 – Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion (Derived_No Offset)

VNI_DR114

Date	25/02/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR114		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	319		23	17	0	0	11	5	1	0	6	2	
Condition	Derived_No offset		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	56.5	51.2	0	0	49.1	1.1	1	0	5.3	3.1	
Bothriochloa macra	25	600	GG				25						
Aristida ramosa	10	500	GG				10						
Paspalidium constrictum	0.4	20	GG				0.4						
*Romulea rosea var. australis**	0.1	10	HT									0.1	
Digitaria brownii	1	30	GG				1						
Digitaria divaricatissima	1	20	GG				1						
Cheilanthes sieberi	1	70	EG						1				
*Acetosa sagittata**	3	400	HT									3	
*Hypochaeris radicata**	1	40	EX								1		
Eragrostis elongata	5	300	GG				5						
Portulaca oleracea	0.4	20	FG					0.4					
Rytidosperma spp.	0.3	20	GG				0.3						
Wahlenbergia communis	0.1	5	FG					0.1					
Aristida vagans	5	40	GG				5						
Oxalis perennans	0.1	10	FG					0.1					
Euphorbia drummondii	0.1	10	FG					0.1					
*Digitaria sanguinalis**	1	20	EX								1		
Enteropogon acicularis	0.4	20	GG				0.4						
Dysphania pumilio	0.4	20	FG					0.4					
Chloris truncata	0.6	20	GG				0.6						
Eragrostis brownii	0.4	20	GG				0.4						
*Conyza spp.**	0.1	5	EX								0.1		
*Avena spp.**	0.1	10	EX								0.1		

Easting	540250
Northing	6099596
Orientation	16
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_DR116PL

Date	26/02/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR116_PL		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	319		25	15	0	0	10	4	1	0	10	3	
Condition	Derived_No offset		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	64.8	60.6	0	0	59.6	0.9	0.1	0	4.2	1.4	
Digitaria divaricatissima	10	500	GG				10						
Bothriochloa macra	15	500	GG				15						
Euphorbia drummondii	0.1	20	FG					0.1					
*Hypochaeris radicata**	1	100	EX								1		
Rytidosperma fulvum	1	30	GG				1						
Panicum effusum	10	300	GG				10						
Paspalidium gracile	2	50	GG				2						
Romulea rosea var. australis	0.1	10	HT									0.1	
*Medicago spp.**	0.1	10	EX								0.1		
*Avena spp.**	0.1	10	EX								0.1		
Aristida ramosa	15	1000	GG				15						
*Bromus molliformis**	0.4	20	EX								0.4		
Oxalis perennans	0.1	20	FG					0.1					
Dysphania pumilio	0.6	20	FG					0.6					
*Acetosa sagittata**	0.3	40	HT									0.3	
Eragrostis elongata	0.7	20	GG				0.7						
Digitaria brownii	5	100	GG				5						
Eragrostis leptostachya	0.4	10	GG				0.4						
*Paspalum dilatatum**	1	20	HT									1	
Cheilanthes sieberi	0.1	20	EG						0.1				
Erodium crinitum	0.1	10	FG					0.1					
*Panicum capillare**	0.3	20	EX								0.3		
Eragrostis parviflora	0.5	20	GG				0.5						
*Solanum nigrum**	0.8	1	EX								0.8		
*Chondrilla juncea**	0.1	5	EX								0.1		

Easting	538554
Northing	6100765
Orientation	132
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_OZ20

Date	26/02/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_OZ20		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	319		14	8	0	0	5	2	1	0	6	2	
Condition	Derived_No offset		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	67.8	46.2	0	0	45.8	0.3	0.1	0	21.6	0.3	
Bothriochloa macra	40	2000	GG				40						
*Hypochaeris radicata**	20	2000	EX								20		
Cynodon dactylon	5	200	GG				5						
*Romulea rosea**	0.1	50	HT									0.1	
*Erodium brachycarpum**	1	2000	EX								1		
Eragrostis spp.	0.2	50	GG				0.2						
Enteropogon acicularis	0.1	10	GG				0.1						
*Acetosella vulgaris**	0.2	50	HT									0.2	
*Eragrostis cilianensis**	0.2	20	EX								0.2		
Cheilanthes austrotenuifolia	0.1	5	EG						0.1				
Dysphania pumilio	0.2	20	FG					0.2					
Digitaria spp.	0.5	100	GG				0.5						
*Medicago sp.**	0.1	5	EX								0.1		
Portulaca oleracea	0.1	1	FG					0.1					

Easting	538247
Northing	6101322
Orientation	324
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

D3.6 PCT 319 – Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion (Thinned)

VNI_DR116

Date	26/02/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR116		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	319		21	13	1	0	10	2	0	0	8	1	
Condition	Thinned		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	37.5	35.2	10	0	23.1	2.1	0	0	2.3	1	
Eucalyptus dealbata	10	7	TG		10								
Digitaria divaricatissima	3	50	GG				3						
Paspalidium gracile	2	30	GG				2						
Rytidosperma racemosum var. racemo	5	100	GG				5						
*Hordeum leporinum**	0.2	80	EX								0.2		
*Hypochaeris radicata**	0.2	20	EX								0.2		
Erodium crinitum	0.1	10	FG					0.1					
Dysphania pumilio	2	30	FG					2					
*Medicago spp.**	0.1	40	EX								0.1		
Panicum effusum	2	20	GG				2						
*Acetosa sagittata**	1	50	HT									1	
Austrostipa scabra	3	200	GG				3						
Juncus spp.	1	3	GG				1						
Chloris truncata	0.4	20	GG				0.4						
*Polygonum aviculare**	0.1	5	EX								0.1		
Eragrostis parviflora	0.7	20	GG				0.7						
*Solanum nigrum**	0.3	1	EX								0.3		
*Chondrilla juncea**	0.1	5	EX								0.1		
Microlaena stipoides var. stipoides	5	1000	GG				5						
*Panicum capillare**	0.3	10	EX								0.3		
Aristida ramosa	1	30	GG				1						

Easting	538514
Northing	6100757
Orientation	216
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	1
20-29	Yes
10-19	Yes
5-9	No
<5	Yes
Hollows	0
Length logs (m)	10
Attributes 1x1 plot (%)	
Litter (%)	70

D3.7 PCT 343 – Mugga Ironbark – Red Box – Red Stringybark – Western Grey Box grass/shrub woodland on metamorphic substrates in the Tarcutta – Gundagai region, NSW South Western Slopes Bioregion (Derived_No Offset)

VNI_DR117

Date	26/02/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR117		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	343		14	11	0	1	8	2	0	0	3	0	
Condition	Derived_No offset		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	76.5	74.4	0	20	53	1.4	0	0	2.1	0	
Acacia genistifolia	20	50	SG			20							
Panicum simile	40	500	GG				40						
Dysphania pumilio	1	30	FG					1					
*Bromus molliformis**	1	30	EX								1		
Eragrostis brownii	1	40	GG				1						
Bothriochloa macra	5	100	GG				5						
Oxalis perennans	0.4	40	FG					0.4					
Panicum effusum	1	20	GG				1						
Eragrostis elongata	1	30	GG				1						
*Hypochaeris radicata**	1	30	EX								1		
Digitaria divaricatissima	2	30	GG				2						
Aristida ramosa	2	30	GG				2						
Digitaria brownii	1	30	GG				1						
*Conyza spp.**	0.1	10	EX								0.1		

Easting	540686
Northing	6099205
Orientation	115
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	5

VNI_DR118

Date	27/02/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR118		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	343		18	8	0	0	7	1	0	0	10	2	
Condition	Derived_No offset		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	57.7	34.8	0	0	33.8	1	0	0	22.9	3.1	
Paspalidium constrictum	5	500	GG				5						
Cynodon dactylon	25	2000	GG				25						
Chloris truncata	1	100	GG				1						
Dysphania pumilio	1	100	FG					1					
*Hypochaeris radicata**	2	200	EX								2		
*Echium plantagineum**	2	100	EX								2		
*Xanthium spinosum**	3	20	HT									3	
*Medicago spp.**	3	2000	EX								3		
*Lolium spp.**	2	3000	EX								2		
*Digitaria sanguinalis**	3	400	EX								3		
*Echinochloa crus-galli**	5	300	EX								5		
*Sonchus oleraceus**	0.8	40	EX								0.8		
Eragrostis parviflora	0.4	20	GG				0.4						
*Eragrostis cilianensis**	2	100	EX								2		
Juncus spp.	1	10	GG				1						
Enteropogon acicularis	0.4	20	GG				0.4						
Panicum effusum	1	40	GG				1						
*Acetosa sagittata**	0.1	10	HT									0.1	

Easting	541237
Northing	6098997
Orientation	100
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

VNI_OZ22

Date	27/02/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_OZ22		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	343		15	8	0	0	6	2	0	0	7	1	
Condition	Derived_No offset		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	84.1	38.2	0	0	37.1	1.1	0	0	45.9	0.2	
*Eragrostis cilianensis**	30	5000	EX								30		
Panicum effusum	20	2000	GG				20						
Echinochloa colona	5	500	GG				5						
Paspalidium distans	10	1000	GG				10						
*Polygonum aviculare**	5	500	EX								5		
*Hypochaeris radicata**	10	1000	EX								10		
*Medicago sp.**	0.1	10	EX								0.1		
Paspalidium spp.	1	100	GG				1						
*Acetosella vulgaris**	0.2	20	HT									0.2	
*Lolium perenne**	0.1	5	EX								0.1		
Dysphania pumilio	1	50	FG					1					
Eragrostis elongata	1	200	GG				1						
Dactyloctenium radulans	0.1	5	GG				0.1						
*Conyza bonariensis**	0.5	20	EX								0.5		
Euphorbia drummondii	0.1	1	FG					0.1					

Easting	540959
Northing	6099147
Orientation	256
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	0

D3.8 PCT 346 – White Box – Blakely's Red Gum – White Cypress Pine shrubby woodland on metamorphic hills in the Wagga Wagga – Cootamundra region of the NSW South Western Slopes Bioregion (Moderate_good)

VNI_DR115

Date	26/02/2025		Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
Plot Name	VNI_DR115		# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
PCT	346		22	17	4	2	7	2	1	1	5	3	
Condition	Moderate-good		Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
Species	Cover	Abundance	83	80.7	11.4	6	61.8	0.5	0.5	0.5	2.3	1.2	
Eucalyptus albens	5	3	TG		5								
Eucalyptus blakelyi	5	15	TG		5								
Callitris glaucophylla	1	1	TG		1								
Acacia implexa	5	10	SG			5							
Amyema miquelii	0.5	1	OG							0.5			
Bursaria spinosa	1	1	SG			1							
Aristida ramosa	50	1000	GG				50						
*Briza minor**	1	100	EX								1		
Digitaria divaricatissima	3	60	GG				3						
Tricoryne elatior	0.1	5	FG					0.1					
Cheilanthes sieberi	0.5	60	EG						0.5				
Gonocarpus elatus	0.4	20	FG					0.4					
Juncus spp.	1	40	GG				1						
*Acetosa sagittata**	0.1	10	HT									0.1	
Panicum effusum	1	30	GG				1						
Lomandra multiflora subsp. multiflora	0.8	10	GG				0.8						
Rytidosperma fulvum	3	30	GG				3						
*Romulea rosea var. australis**	0.1	5	HT									0.1	
*Hypochaeris radicata**	0.1	5	EX								0.1		
*Paspalum dilatatum**	1	20	HT									1	
Brachychiton populneus subsp. populne	0.4	20	TG		0.4								
Lomandra filiformis subsp. coriacea	3	30	GG				3						

Easting	538214
Northing	6101258
Orientation	140
Plot size	20 X 20 X 50
Attributes 20x50m plot	
Stem classes	
80+	1
50-79	0
30-49	1
20-29	Yes
10-19	Yes
5-9	Yes
<5	Yes
Hollows	1
Length logs (m)	18
Attributes 1x1 plot (%)	
Litter (%)	66

Appendix E

Credit reports

BAM Credit Summary Report

Proposal Details

Assessment Id
00047237/BAAS23009/24/00047238

Proposal Name
VNI - Inland Slopes

BAM data last updated *
09/04/2026

Assessor Name
Devon T Raiff

Report Created
01/06/2026

BAM Data version *
Current classification (live - default) (94)

Assessor Number
BAAS23009

BAM Case Status
Finalised

Date Finalised
18/05/2026

Assessment Revision
12

BOS entry trigger

Assessment Type
Major Projects

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

Zone	Vegetation zone name	TEC name	Current Vegetation integrity score	Change in Vegetation integrity (loss / gain)	Area (ha)	Sensitivity to loss (Justification)	Species sensitivity to gain class	BC Act Listing status	EPBC Act listing status	Biodiversity risk weighting	Potential SAII	Ecosystem credits

Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion												
2	277_Derived_No_offset	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Ri	13.4	13.4	13.7	Population size	High Sensitivity to Gain	Critically Endangered Ecological Community	Not Listed	2.50	True	0

3	277_Thinned	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Ri	63.4	51.4	2.3	Population size	High Sensitivity to Gain	Critically Endangered Ecological Community	Not Listed	2.50	True	73

4	277_Native_plantings	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Ri	54	54.0	0.01	Population size	High Sensitivity to Gain	Critically Endangered Ecological Community	Not Listed	2.50	True	1

8	277_Moderate-good	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Ri	100	100.0	0.34	Population size	High Sensitivity to Gain	Critically Endangered Ecological Community	Not Listed	2.50	True	21
											Subtotal	**95**
Mugga Ironbark - Red Box - Red Stringybark - Western Grey Box grass/shrub woodland on metamorphic substrates in the Tarcutta - Gundagai region, NSW South Western Slopes Bioregion												
7	343_Derived_No_offset	Not a TEC	8.5	8.5	4.4	PCT Cleared - 88%	High Sensitivity to Gain			2.00		0

9	343_Moderate-good	Not a TEC	100	87.2	0.04	PCT Cleared - 88%	High Sensitivity to Gain			2.00		2
											Subtotal	**2**
Tumbledown Red Gum - White Cypress Pine hill woodland in the southern part of the NSW South Western Slopes Bioregion												
5	319_Derived_No_offset	Not a TEC	8.7	8.7	8.8	PCT Cleared - 60%	Low Sensitivity to Gain			1.25		0
6	319_Thinned	Not a TEC	31	30.1	0.43	PCT Cleared - 60%	High Sensitivity to Gain			1.75		6
											Subtotal	**6**

White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion												
1	266_Moderate-good	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Ri	73.6	45.0	0.09	Population size	High Sensitivity to Gain	Critically Endangered Ecological Community	Not Listed	2.50	True	3
											Subtotal	**3**
											Total	**106**

Species credits for threatened species

Vegetation zone name	Habitat condition (Vegetation Integrity)	Change in habitat condition	Area (ha)/Count (no. individuals)	Sensitivity to loss (Justification)	Sensitivity to gain (Justification)	BC Act Listing status	EPBC Act listing status	Potential SAII	Species credits
Ammobium craspedioides / Yass Daisy (Flora)									
277_Thinned	51.4	51.4	0.48	Biodiversity Conservation Act listing status	Quantity class of viable seeds produced	Vulnerable	Vulnerable	False	12
277_Native_plantings	54.0	54.0	0.01	Biodiversity Conservation Act listing status	Quantity class of viable seeds produced	Vulnerable	Vulnerable	False	1
277_Moderate-good	100.0	100.0	0.12	Biodiversity Conservation Act listing status	Quantity class of viable seeds produced	Vulnerable	Vulnerable	False	6
								Subtotal	**19**
Cullen parvum / Small Scurf-pea (Flora)									
277_Thinned	51.4	51.4	1.3	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Endangered	Not Listed	False	34
277_Native_plantings	54.0	54.0	0.01	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Endangered	Not Listed	False	1

277_Moderate-good	100.0	100.0	0.3	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Endangered	Not Listed	False	15
								Subtotal	**50**
Petaurus norfolcensis - endangered population / Squirrel Glider in the Wagga Wagga Local Government Area (Fauna)									
266_Moderate-good	73.6	73.6	0.04	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Endangered Population	Not Listed	False	1
277_Thinned	63.4	63.4	0.25	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Endangered Population	Not Listed	False	8
319_Thinned	31.0	31.0	0.25	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Endangered Population	Not Listed	False	4
277_Moderate-good	100.0	100.0	0.13	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Endangered Population	Not Listed	False	7
277_Derived_No_offset	13.4	13.4	0.14	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Endangered Population	Not Listed	False	1

319_Derived_No_offset	8.7	8.7	0.01	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Endangered Population	Not Listed	False	1
								Subtotal	**22**
Polytelis swainsonii / Superb Parrot (Fauna)									
266_Moderate-good	73.6	73.6	0.08	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Vulnerable	False	3
277_Thinned	63.4	63.4	0.79	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Vulnerable	False	25
277_Moderate-good	100.0	100.0	0.21	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Vulnerable	False	11
								Subtotal	**39**
Prasophyllum petilum / Tarengo Leek Orchid (Flora)									
277_Thinned	51.4	51.4	0.48	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	12

277_Native_plantings	54.0	54.0	0.01	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	1
277_Moderate-good	100.0	100.0	0.12	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	6
								Subtotal	**19**
Swainsona recta / Small Purple-pea (Flora)									
277_Thinned	51.4	51.4	0.48	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	12
277_Native_plantings	54.0	54.0	0.01	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	1
277_Moderate-good	100.0	100.0	0.12	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	6
								Subtotal	**19**

Swainsona sericea / Silky Swainson-pea (Flora)									
277_Thinned	51.4	51.4	0.48	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Not Listed	False	12
277_Native_plantings	54.0	54.0	0.01	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Not Listed	False	1
277_Moderate-good	100.0	100.0	0.12	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Not Listed	False	6
								Subtotal	**19**

BAM Candidate Species Report

Proposal Details

Assessment Id 00047237/BAAS23009/24/00047238	Proposal Name VNI - Inland Slopes	BAM data last updated * 09/04/2026
Assessor Name Devon T Raiff	Report Created 01/06/2026	BAM Data version * Current classification (live - default) (94)
Assessor Number BAAS23009	Assessment Type Major Projects	BAM Case Status Finalised
Assessment Revision 12	BOS entry trigger	Date Finalised 18/05/2026

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

List of Species Requiring Survey

Name	Presence	Survey Months
Ammobium craspedioides Yass Daisy	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Aprasia parapulchella Pink-tailed Legless Lizard	No (expert report)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Burhinus grallarius Bush Stone-curlew	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☑ Dec ☐ Survey month outside the specified months?

Callocephalon fimbriatum Gang-gang Cockatoo	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☑ Dec ☐ Survey month outside the specified months?
Cullen parvum Small Scurf-pea	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Delma impar Striped Legless Lizard	No (expert report)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Grevillea wilkinsonii Tumut Grevillea	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Hieraaetus morphnoides Little Eagle	No (surveyed) *Survey months are outside of the months specified in Bionet.	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☑ Dec ☑ Survey month outside the specified months?
Keyacris scurra Key's Matchstick Grasshopper	No (expert report)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Lophoictinia isura Square-tailed Kite	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☑ Sep ☑ Oct ☐ Nov ☑ Dec ☐ Survey month outside the specified months?
Ninox connivens Barking Owl	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☑ Dec ☐ Survey month outside the specified months?
Petaurus norfolcensis - endangered population Squirrel Glider in the Wagga Wagga Local Government Area	Yes (expert report)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Phascogale tapoatafa Brush-tailed Phascogale	No (expert report)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Phascolarctos cinereus Koala	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☑ Sep ☑ Oct ☐ Nov ☑ Dec ☐ Survey month outside the specified months?
Polytelis swainsonii Superb Parrot	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Prasophyllum petilum Tarengo Leek Orchid	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Swainsona recta Small Purple-pea	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Swainsona sericea Silky Swainson-pea	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Synemon plana Golden Sun Moth	No (expert report)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Tyto novaehollandiae Masked Owl	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☑ Dec ☐ Survey month outside the specified months?

Threatened species Manually Added

None added

Threatened species assessed as not on site

Refer to BAR for detailed justification

BAM Candidate Species Report

Common name	Scientific name	Justification in the BAM-C
Ausfeld's Wattle	Acacia ausfeldii	Habitat constraints
Booroolong Frog	Litoria booroolongensis	Habitat degraded Species is vagrant
Brush-tailed Rock-wallaby	Petrogale penicillata	Habitat constraints
Dwarf Bush-pea	Pultenaea humilis	Refer to BAR
Eastern Pygmy-possum	Cercartetus nanus	Species is vagrant
Euphrasia arguta	Euphrasia arguta	Species is vagrant
Grey-headed Flying-fox	Pteropus poliocephalus	Habitat constraints
Large Bent-winged Bat	Miniopterus orianae oceanensis	Habitat constraints
Large-eared Pied Bat	Chalinolobus dwyeri	Habitat constraints
Powerful Owl	Ninox strenua	Refer to BAR
Prasophyllum sp. Wybong	Prasophyllum petilum	Species is vagrant
Regent Honeyeater	Anthochaera phrygia	Refer to BAR
South-eastern Glossy Black-Cockatoo	Calyptorhynchus lathami lathami	Refer to BAR
Southern Myotis	Myotis macropus	Habitat constraints
Squirrel Glider	Petaurus norfolcensis	Refer to BAR
Swift Parrot	Lathamus discolor	Habitat constraints
White-bellied Sea-Eagle	Haliaeetus leucogaster	Refer to BAR
Woolly Ragwort	Senecio garlandii	Refer to BAR

BAM Predicted Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00047237/BAAS23009/24/00047238	VNI - Inland Slopes	09/04/2026
Assessor Name	Report Created	BAM Data version *
Devon T Raiff	01/06/2026	Current classification (live - default) (94)
Assessor Number	Assessment Type	BAM Case Status
BAAS23009	Major Projects	Finalised
Assessment Revision	BOS entry trigger	Date Finalised
12		18/05/2026

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Threatened species reliably predicted to utilise the site. No surveys are required for these species. Ecosystem credits apply to these species.

Common Name	Scientific Name	Vegetation Types(s)
Black Falcon	Falco subniger	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
		277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Black-chinned Honeyeater (eastern subspecies)	Melithreptus gularis gularis	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
		277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
		319-Tumbledown Red Gum - White Cypress Pine hill woodland in the southern part of the NSW South Western Slopes Bioregion
		343-Mugga Ironbark - Red Box - Red Stringybark - Western Grey Box grass/shrub woodland on metamorphic substrates in the Tarcutta - Gundagai region, NSW South Western Slopes Bioregion
Brown Treecreeper (eastern subspecies)	Climacteris picumnus victoriae	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
		277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion

Brown Treecreeper (eastern subspecies)	Climacteris picumnus victoriae	343-Mugga Ironbark - Red Box - Red Stringybark - Western Grey Box grass/shrub woodland on metamorphic substrates in the Tarcutta - Gundagai region, NSW South Western Slopes Bioregion
Corben's Long-eared Bat	Nyctophilus corbeni	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
Diamond Firetail	Stagonopleura guttata	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
		277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
		319-Tumbledown Red Gum - White Cypress Pine hill woodland in the southern part of the NSW South Western Slopes Bioregion
		343-Mugga Ironbark - Red Box - Red Stringybark - Western Grey Box grass/shrub woodland on metamorphic substrates in the Tarcutta - Gundagai region, NSW South Western Slopes Bioregion
Dusky Woodswallow	Artamus cyanopterus cyanopterus	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
		277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
		319-Tumbledown Red Gum - White Cypress Pine hill woodland in the southern part of the NSW South Western Slopes Bioregion
		343-Mugga Ironbark - Red Box - Red Stringybark - Western Grey Box grass/shrub woodland on metamorphic substrates in the Tarcutta - Gundagai region, NSW South Western Slopes Bioregion
Eastern False Pipistrelle	Falsistrellus tasmaniensis	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
		277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
		343-Mugga Ironbark - Red Box - Red Stringybark - Western Grey Box grass/shrub woodland on metamorphic substrates in the Tarcutta - Gundagai region, NSW South Western Slopes Bioregion
Flame Robin	Petroica phoenicea	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
		277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion

Flame Robin	Petroica phoenicea	343-Mugga Ironbark - Red Box - Red Stringybark - Western Grey Box grass/shrub woodland on metamorphic substrates in the Tarcutta - Gundagai region, NSW South Western Slopes Bioregion
Gang-gang Cockatoo	Callocephalon fimbriatum	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
		277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
		343-Mugga Ironbark - Red Box - Red Stringybark - Western Grey Box grass/shrub woodland on metamorphic substrates in the Tarcutta - Gundagai region, NSW South Western Slopes Bioregion
Grey-crowned Babbler (eastern subspecies)	Pomatostomus temporalis temporalis	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
		277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
		319-Tumbledown Red Gum - White Cypress Pine hill woodland in the southern part of the NSW South Western Slopes Bioregion
Grey-headed Flying-fox	Pteropus poliocephalus	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
		277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Large Bent-winged Bat	Miniopterus orianae oceanensis	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
		277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Latham's Snipe	Gallinago hardwickii	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
		277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
		343-Mugga Ironbark - Red Box - Red Stringybark - Western Grey Box grass/shrub woodland on metamorphic substrates in the Tarcutta - Gundagai region, NSW South Western Slopes Bioregion
Little Eagle	Hieraaetus morphnoides	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
		277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion

Little Eagle	Hieraaetus morphnoides	319-Tumbledown Red Gum - White Cypress Pine hill woodland in the southern part of the NSW South Western Slopes Bioregion
		343-Mugga Ironbark - Red Box - Red Stringybark - Western Grey Box grass/shrub woodland on metamorphic substrates in the Tarcutta - Gundagai region, NSW South Western Slopes Bioregion
Little Lorikeet	Parvipsitta pusilla	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
		277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
		319-Tumbledown Red Gum - White Cypress Pine hill woodland in the southern part of the NSW South Western Slopes Bioregion
		343-Mugga Ironbark - Red Box - Red Stringybark - Western Grey Box grass/shrub woodland on metamorphic substrates in the Tarcutta - Gundagai region, NSW South Western Slopes Bioregion
Painted Honeyeater	Grantiella picta	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
		277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
		319-Tumbledown Red Gum - White Cypress Pine hill woodland in the southern part of the NSW South Western Slopes Bioregion
		343-Mugga Ironbark - Red Box - Red Stringybark - Western Grey Box grass/shrub woodland on metamorphic substrates in the Tarcutta - Gundagai region, NSW South Western Slopes Bioregion
Purple-crowned Lorikeet	Parvipsitta porphyrocephala	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
Regent Honeyeater	Anthochaera phrygia	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
		277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
		319-Tumbledown Red Gum - White Cypress Pine hill woodland in the southern part of the NSW South Western Slopes Bioregion

Regent Honeyeater	Anthochaera phrygia	343-Mugga Ironbark - Red Box - Red Stringybark - Western Grey Box grass/shrub woodland on metamorphic substrates in the Tarcutta - Gundagai region, NSW South Western Slopes Bioregion
Scarlet Robin	Petroica boodang	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
		277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
		319-Tumbledown Red Gum - White Cypress Pine hill woodland in the southern part of the NSW South Western Slopes Bioregion
		343-Mugga Ironbark - Red Box - Red Stringybark - Western Grey Box grass/shrub woodland on metamorphic substrates in the Tarcutta - Gundagai region, NSW South Western Slopes Bioregion
South-eastern Hooded Robin	Melanodryas cucullata cucullata	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
		277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
		319-Tumbledown Red Gum - White Cypress Pine hill woodland in the southern part of the NSW South Western Slopes Bioregion
		343-Mugga Ironbark - Red Box - Red Stringybark - Western Grey Box grass/shrub woodland on metamorphic substrates in the Tarcutta - Gundagai region, NSW South Western Slopes Bioregion
Southern Whiteface	Aphelocephala leucopsis	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
		277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Speckled Warbler	Pyrrholaemus sagittatus	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
		277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
		319-Tumbledown Red Gum - White Cypress Pine hill woodland in the southern part of the NSW South Western Slopes Bioregion
		343-Mugga Ironbark - Red Box - Red Stringybark - Western Grey Box grass/shrub woodland on metamorphic substrates in the Tarcutta - Gundagai region, NSW South Western Slopes Bioregion

Spotted Harrier	Circus assimilis	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
		277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Spotted-tailed Quoll	Dasyurus maculatus	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
		277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
		343-Mugga Ironbark - Red Box - Red Stringybark - Western Grey Box grass/shrub woodland on metamorphic substrates in the Tarcutta - Gundagai region, NSW South Western Slopes Bioregion
Square-tailed Kite	Lophoictinia isura	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
		277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Superb Parrot	Polytelis swainsonii	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
		277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
		343-Mugga Ironbark - Red Box - Red Stringybark - Western Grey Box grass/shrub woodland on metamorphic substrates in the Tarcutta - Gundagai region, NSW South Western Slopes Bioregion
Swift Parrot	Lathamus discolor	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
		277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
		319-Tumbledown Red Gum - White Cypress Pine hill woodland in the southern part of the NSW South Western Slopes Bioregion
		343-Mugga Ironbark - Red Box - Red Stringybark - Western Grey Box grass/shrub woodland on metamorphic substrates in the Tarcutta - Gundagai region, NSW South Western Slopes Bioregion
Turquoise Parrot	Neophema pulchella	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
		277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion

Turquoise Parrot	Neophema pulchella	319-Tumbledown Red Gum - White Cypress Pine hill woodland in the southern part of the NSW South Western Slopes Bioregion
		343-Mugga Ironbark - Red Box - Red Stringybark - Western Grey Box grass/shrub woodland on metamorphic substrates in the Tarcutta - Gundagai region, NSW South Western Slopes Bioregion
Varied Sittella	Daphoenositta chrysoptera	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
		277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
		319-Tumbledown Red Gum - White Cypress Pine hill woodland in the southern part of the NSW South Western Slopes Bioregion
		343-Mugga Ironbark - Red Box - Red Stringybark - Western Grey Box grass/shrub woodland on metamorphic substrates in the Tarcutta - Gundagai region, NSW South Western Slopes Bioregion
White-throated Needletail	Hirundapus caudacutus	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
		277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
		319-Tumbledown Red Gum - White Cypress Pine hill woodland in the southern part of the NSW South Western Slopes Bioregion
		343-Mugga Ironbark - Red Box - Red Stringybark - Western Grey Box grass/shrub woodland on metamorphic substrates in the Tarcutta - Gundagai region, NSW South Western Slopes Bioregion
Yellow-bellied Glider	Petaurus australis	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
		277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Yellow-bellied Sheathtail-bat	Saccolaimus flaviventris	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
		277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion

Threatened species Manually Added

None added

BAM Predicted Species Report

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Common Name	Scientific Name	Plant Community Type(s)
Malleefowl	Leipoa ocellata	343-Mugga Ironbark - Red Box - Red Stringybark - Western Grey Box grass/shrub woodland on metamorphic substrates in the Tarcutta - Gundagai region, NSW South Western Slopes Bioregion
South-eastern Glossy Black-Cockatoo	Calyptorhynchus lathami lathami	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
		343-Mugga Ironbark - Red Box - Red Stringybark - Western Grey Box grass/shrub woodland on metamorphic substrates in the Tarcutta - Gundagai region, NSW South Western Slopes Bioregion
White-bellied Sea-Eagle	Haliaeetus leucogaster	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
		277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
		319-Tumbledown Red Gum - White Cypress Pine hill woodland in the southern part of the NSW South Western Slopes Bioregion
		343-Mugga Ironbark - Red Box - Red Stringybark - Western Grey Box grass/shrub woodland on metamorphic substrates in the Tarcutta - Gundagai region, NSW South Western Slopes Bioregion

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Refer to BAR for detailed justification

Common Name	Scientific Name	Justification in the BAM-C
Malleefowl	Leipoa ocellata	Species is vagrant
South-eastern Glossy Black-Cockatoo	Calyptorhynchus lathami lathami	Refer to BAR
White-bellied Sea-Eagle	Haliaeetus leucogaster	Refer to BAR

BAM Vegetation Zones Report

Proposal Details

Assessment Id
00047237/BAAS23009/24/00047238

Assessment name
VNI - Inland Slopes

BAM data last updated *
09/04/2026

Assessor Name
Devon T Raiff

Report Created
01/06/2026

BAM Data version *
Current classification (live - default) (94)

Assessor Number
BAAS23009

Assessment Type
Major Projects

BAM Case Status
Finalised

Assessment Revision
12

BOS entry trigger

Date Finalised
18/05/2026

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Vegetation Zones

#	Name	PCT	Condition	Area	Minimum number of plots	Management zones
1	266_Moderate-good	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion	Moderate-good	0.09	1	Dist_AreaA (0.01 ha) Dist b4 (0.03 ha) Dist B10 (0.05 ha)

2	277_Derived_No_offset	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	Derived_No_offset	13.69	3	Dist_AreaA (13.69 ha)
3	277_Thinned	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	Thinned	2.26	2	Dist_AreaA (1.29 ha) Dist b4 (0.46 ha) Dist b10 (0.51 ha)
4	277_Native_plantings	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	Native_plantings	0.01	1	Dist_AreaA (0.01 ha)
5	319_Derived_No_offset	319-Tumbledown Red Gum - White Cypress Pine hill woodland in the southern part of the NSW South Western Slopes Bioregion	Derived_No_offset	8.81	3	Dist_AreaA (8.81 ha)
6	319_Thinned	319-Tumbledown Red Gum - White Cypress Pine hill woodland in the southern part of the NSW South Western Slopes Bioregion	Thinned	0.43	1	Dist_AreaA (0.38 ha) Dist b4 (0.01 ha) Dist B10 (0.04 ha)
7	343_Derived_No_offset	343-Mugga Ironbark - Red Box - Red Stringybark - Western Grey Box grass/shrub woodland on metamorphic substrates in the Tarcutta - Gundagai region, NSW South Western Slopes Bioregion	Derived_No_offset	4.36	2	Dist_AreaA (4.36 ha)
8	277_Moderate-good	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	Moderate-good	0.34	1	Dist_AreaA (0.34 ha)

9	343_Moderate-good	343-Mugga Ironbark - Red Box - Red Stringybark - Western Grey Box grass/shrub woodland on metamorphic substrates in the Tarcutta - Gundagai region, NSW South Western Slopes Bioregion	Moderate-good	0.04	1	Dist_AreaA (0.02 ha) Dist b10 (0.02 ha)

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id
00047237/BAAS23009/24/00047238

Proposal Name
VNI - Inland Slopes

BAM data last updated *
09/04/2026

Assessor Name
Devon T Raiff

Assessor Number
BAAS23009

BAM Data version *
Current classification (live - default) (94)

Proponent Names

Report Created
01/06/2026

BAM Case Status
Finalised

Assessment Revision
12

BOS entry trigger

Assessment Type
Major Projects

Date Finalised
18/05/2026

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Ri	Critically Endangered Ecological Community	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Ri	Critically Endangered Ecological Community	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion

Species
Nil

Additional Information for Approval

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
Calyptorhynchus lathami lathami / South-eastern Glossy Black-Cockatoo
Leipoa ocellata / Malleefowl
Haliaeetus leucogaster / White-bellied Sea-Eagle

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

BAM Biodiversity Credit Report (Like for like)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Ri	0.1	3	0	3
277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Ri	16.3	74	21	95
319-Tumbledown Red Gum - White Cypress Pine hill woodland in the southern part of the NSW South Western Slopes Bioregion	Not a TEC	9.2	0	6	6
343-Mugga Ironbark - Red Box - Red Stringybark - Western Grey Box grass/shrub woodland on metamorphic substrates in the Tarcutta - Gundagai region, NSW South Western Slopes Bioregion	Not a TEC	4.4	0	2	2

BAM Biodiversity Credit Report (Like for like)

266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion

Like-for-like credit retirement options

Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Ri This includes PCT's: 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492,	-	266_Moderate-good	Yes	3	Inland Slopes, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	496, 508, 509, 510, 511, 516, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 847, 851, 921, 1099, 1303, 1304, 1307, 1324, 1329, 1330, 1332, 1383, 1606, 1608, 1611, 1691, 1693, 1695, 1698, 3314, 3359, 3363, 3373, 3376, 3387, 3388, 3394, 3395, 3396, 3397, 3398, 3399, 3406, 3415, 3533, 4147, 4149, 4150					
277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	**Like-for-like credit retirement options**					
	Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland,	-	277_Derived_No_offset	No	0	Inland Slopes, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Ri This includes PCT's: 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 516, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 847, 851, 921, 1099, 1303, 1304, 1307, 1324, 1329, 1330, 1332, 1383, 1606, 1608, 1611, 1691, 1693, 1695, 1698, 3314,					

	3359, 3363, 3373, 3376, 3387, 3388, 3394, 3395, 3396, 3397, 3398, 3399, 3406, 3415, 3533, 4147, 4149, 4150					
	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Ri This includes PCT's: 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437,	-	277_Thinned	Yes	73	Inland Slopes, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 516, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 847, 851, 921, 1099, 1303, 1304, 1307, 1324, 1329, 1330, 1332, 1383, 1606, 1608, 1611, 1691, 1693, 1695, 1698, 3314, 3359, 3363, 3373, 3376, 3387, 3388, 3394, 3395, 3396, 3397, 3398, 3399, 3406, 3415, 3533, 4147, 4149, 4150					
	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern	-	277_Native_plantings	Yes	1	Inland Slopes, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	Highlands, NSW South Western Slopes, South East Corner and Ri This includes PCT's: 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 516, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 847, 851, 921, 1099, 1303, 1304, 1307, 1324, 1329, 1330, 1332, 1383, 1606, 1608, 1611, 1691, 1693, 1695, 1698, 3314, 3359, 3363, 3373, 3376, 3387, 3388, 3394, 3395, 3396, 3397, 3398, 3399,					

	3406, 3415, 3533, 4147, 4149, 4150					
	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Ri This includes PCT's: 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 516, 528, 538, 544, 563,	-	277_Moderate-good	No	21	Inland Slopes, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 847, 851, 921, 1099, 1303, 1304, 1307, 1324, 1329, 1330, 1332, 1383, 1606, 1608, 1611, 1691, 1693, 1695, 1698, 3314, 3359, 3363, 3373, 3376, 3387, 3388, 3394, 3395, 3396, 3397, 3398, 3399, 3406, 3415, 3533, 4147, 4149, 4150					
319-Tumbledown Red Gum - White Cypress Pine hill woodland in the southern part of the NSW South Western Slopes Bioregion	**Like-for-like credit retirement options**					
	Class	Trading group	Zone	HBT	Credits	IBRA region
	Inland Rocky Hill Woodlands This includes PCT's: 177, 178, 318, 319	Inland Rocky Hill Woodlands >=50% and <70%	319_Derived_No_offset	No	0	Inland Slopes, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Inland Rocky Hill Woodlands This includes PCT's: 177, 178, 318, 319	Inland Rocky Hill Woodlands >=50% and <70%	319_Thinned	No	6	Inland Slopes, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

319-Tumbledown Red Gum - White Cypress Pine hill woodland in the southern	
343-Mugga Ironbark - Red Box - Red Stringybark - Western Grey Box grass/shrub woodland on metamorphic substrates in the Tarcutta - Gundagai region, NSW South Western Slopes Bioregion	**Like-for-like credit retirement options**

Class	Trading group	Zone	HBT	Credits	IBRA region
Western Slopes Dry Sclerophyll Forests This includes PCT's: 54, 110, 333, 341, 343, 358, 472, 1279, 1668	Western Slopes Dry Sclerophyll Forests >=70% and <90%	343_Derived_No_offset	No	0	Inland Slopes, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Western Slopes Dry Sclerophyll Forests This includes PCT's: 54, 110, 333, 341, 343, 358, 472, 1279, 1668	Western Slopes Dry Sclerophyll Forests >=70% and <90%	343_Moderate-good	No	2	Inland Slopes, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

Species	Vegetation Zone/s	Area / Count	Credits
Ammobium craspedioides / Yass Daisy	**277_Thinned, 277_Native_plantings, 277_Moderate-good**	0.6	19.00

Cullen parvum / Small Scurf-pea	**277_Thinned, 277_Native_plantings, 277_Moderate-good**	1.6	50.00
Petaurus norfolcensis - endangered population / Squirrel Glider in the Wagga Wagga Local Government Area	**266_Moderate-good, 277_Thinned, 319_Thinned, 277_Moderate-good, 277_Derived_No_offset, 319_Derived_No_offset**	0.8	22.00
Polytelis swainsonii / Superb Parrot	**266_Moderate-good, 277_Thinned, 277_Moderate-good**	1.1	39.00
Prasophyllum petilum / Tarengo Leek Orchid	**277_Thinned, 277_Native_plantings, 277_Moderate-good**	0.6	19.00
Swainsona recta / Small Purple-pea	**277_Thinned, 277_Native_plantings, 277_Moderate-good**	0.6	19.00
Swainsona sericea / Silky Swainson-pea	**277_Thinned, 277_Native_plantings, 277_Moderate-good**	0.6	19.00

Credit Retirement Options

Like-for-like credit retirement options

	Spp	IBRA subregion
Ammobium craspedioides / Yass Daisy		

	Ammobium craspedioides / Yass Daisy	Any in NSW
Cullen parvum / Small Scurf-pea	Spp	IBRA subregion
	Cullen parvum / Small Scurf-pea	Any in NSW
Petaurus norfolcensis - endangered population / Squirrel Glider in the Wagga Wagga Local Government Area	Spp	IBRA subregion
	Petaurus norfolcensis - endangered population / Squirrel Glider in the Wagga Wagga Local Government Area	Any in NSW
Polytelis swainsonii / Superb Parrot	Spp	IBRA subregion
	Polytelis swainsonii / Superb Parrot	Any in NSW
Prasophyllum petilum / Tarengo Leek Orchid	Spp	IBRA subregion
	Prasophyllum petilum / Tarengo Leek Orchid	Any in NSW
Swainsona recta / Small Purple-pea	Spp	IBRA subregion
	Swainsona recta / Small Purple-pea	Any in NSW
Swainsona sericea / Silky Swainson-pea	Spp	IBRA subregion
	Swainsona sericea / Silky Swainson-pea	Any in NSW

BAM Credit Summary Report

Proposal Details

Assessment Id
00047237/BAAS19078/26/00063696

Proposal Name
VNI Stage 1 Dinawan

BAM data last updated *
09/04/2026

Assessor Name
Devon T Raiff

Report Created
01/06/2026

BAM Data version *
Current classification (live - default) (94)

Assessor Number
BAAS23009

BAM Case Status
Finalised

Date Finalised
18/05/2026

Assessment Revision
1

BOS entry trigger

Assessment Type
Major Projects

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Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

Zone	Vegetation zone name	TEC name	Current Vegetation integrity score	Change in Vegetation integrity (loss / gain)	Area (ha)	Sensitivity to loss (Justification)	Species sensitivity to gain class	BC Act Listing status	EPBC Act listing status	Biodiversity risk weighting	Potential SAII	Ecosystem credits
Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion												
2	216_Moderate-good	Not a TEC	88.1	88.1	5.2	PCT Cleared - 0%	High Sensitivity to Gain			1.50		173
											Subtotal	**173**

Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion												
3	44_SVTM	Natural Grasslands of the Murray Valley Plains	100	100.0	0.17	Environment Protection and Conservation Act listing status	High Sensitivity to Gain	Not Listed	Critically Endangered	2.50		11
											Subtotal	**11**
Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion												
1	26_Derived	Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions	27.7	27.7	42.7	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00		592

4	26_Moderate-good	Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions	63.3	63.3	0.01	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00		1
											Subtotal	**593**
											Total	**777**

Species credits for threatened species

Vegetation zone name	Habitat condition (Vegetation Integrity)	Change in habitat condition	Area (ha)/Count (no. individuals)	Sensitivity to loss (Justification)	Sensitivity to gain (Justification)	BC Act Listing status	EPBC Act listing status	Potential SAII	Species credits
Austrostipa wakoolica / A spear-grass (Flora)									
26_Derived	27.7	27.7	42.7	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	592

26_Moderate-good	63.3	63.3	0.01	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	1
								Subtotal	**593**
Brachyscome muelleroides / Claypan Daisy (Flora)									
44_SVTM	100.0	100.0	0.17	Geographic Distribution	Ability to colonise improved habitat	Vulnerable	Vulnerable	True	13
								Subtotal	**13**
Brachyscome papillosa / Mossgiel Daisy (Flora)									
216_Moderate-good	88.1	88.1	3.4	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	149
44_SVTM	100.0	100.0	0.17	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	9
								Subtotal	**158**

Convolvulus tedmoorei / Bindweed (Flora)									
44_SVTM	100.0	100.0	0.17	Population size	Ecology or response to management is poorly known	Endangered	Not Listed	True	13
								Subtotal	**13**
Cullen parvum / Small Scurf-pea (Flora)									
44_SVTM	100.0	100.0	0.17	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Endangered	Not Listed	False	9
								Subtotal	**9**
Eleocharis obicis / Spike-Rush (Flora)									
216_Moderate-good	88.1	88.1	3.4	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Vulnerable	Vulnerable	False	149
								Subtotal	**149**
Lepidium monoplocoides / Winged Peppercress (Flora)									
26_Derived	27.7	27.7	26.6	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	369

216_Moderate-good	88.1	88.1	3.4	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	149
26_Moderate-good	63.3	63.3	0.01	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	1
								Subtotal	**519**
Leptorhynchos orientalis / Lanky Buttons (Flora)									
26_Derived	27.7	27.7	26.6	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Not Listed	False	369
44_SVTM	100.0	100.0	0.17	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Not Listed	False	9
26_Moderate-good	63.3	63.3	0.01	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Not Listed	False	1
								Subtotal	**379**

Maireana cheelii / Chariot Wheels (Flora)									
26_Derived	27.7	27.7	26.6	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	369
44_SVTM	100.0	100.0	0.17	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	9
26_Moderate-good	63.3	63.3	0.01	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	1
								Subtotal	**379**
Pilularia novae-hollandiae / Austral Pillwort (Flora)									
26_Derived	27.7	27.7	26.6	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Endangered	Not Listed	False	369
44_SVTM	100.0	100.0	0.17	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Endangered	Not Listed	False	9

26_Moderate-good	63.3	63.3	0.01	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Endangered	Not Listed	False	1
								Subtotal	**379**
Sclerolaena napiformis / Turnip Copperburr (Flora)									
26_Derived	27.7	27.7	26.6	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	369
44_SVTM	100.0	100.0	0.17	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	9
26_Moderate-good	63.3	63.3	0.01	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	1
								Subtotal	**379**
Swainsona murrayana / Slender Darling Pea (Flora)									
26_Derived	27.7	27.7	26.6	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	369

216_Moderate-good	88.1	88.1	3.4	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	149
44_SVTM	100.0	100.0	0.17	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	9
26_Moderate-good	63.3	63.3	0.01	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	1
								Subtotal	**528**
Swainsona plagiotropis / Red Darling Pea (Flora)									
26_Derived	27.7	27.7	26.6	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	369
44_SVTM	100.0	100.0	0.17	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	9
26_Moderate-good	63.3	63.3	0.01	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	1
								Subtotal	**379**

Swainsona sericea / Silky Swainson-pea (Flora)									
26_Derived	27.7	27.7	26.6	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Not Listed	False	369
44_SVTM	100.0	100.0	0.17	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Not Listed	False	9
26_Moderate-good	63.3	63.3	0.01	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Not Listed	False	1
								Subtotal	**379**

BAM Candidate Species Report

Proposal Details

Assessment Id 00047237/BAAS19078/26/00063696	Proposal Name VNI Stage 1 Dinawan	BAM data last updated * 09/04/2026
Assessor Name Devon T Raiff	Report Created 01/06/2026	BAM Data version * Current classification (live - default) (94)
Assessor Number BAAS23009	Assessment Type Major Projects	BAM Case Status Finalised
Assessment Revision 1	BOS entry trigger	Date Finalised 18/05/2026

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

List of Species Requiring Survey

Name	Presence	Survey Months
Ardeotis australis Australian Bustard	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Austrostipa wakoolica A spear-grass	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Brachyscome muelleroides Claypan Daisy	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Brachyscome papillosa Mossgiel Daisy	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Burhinus grallarius Bush Stone-curlew	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☑ Apr ☐ May ☐ Jun ☐ Jul ☑ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Convolvulus tedmoorei Bindweed	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Cullen parvum Small Scurf-pea	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Eleocharis obicis Spike-Rush	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Lepidium monoplocoides Winged Peppercress	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Leptorhynchos orientalis Lanky Buttons	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Maireana cheelii Chariot Wheels	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Pilularia novae-hollandiae Austral Pillwort	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Sclerolaena napiformis Turnip Copperburr	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Swainsona murrayana Slender Darling Pea	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Swainsona plagiotropis Red Darling Pea	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Swainsona sericea Silky Swainson-pea	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Threatened species Manually Added

None added

Threatened species assessed as not on site

Refer to BAR for detailed justification

Common name	Scientific name	Justification in the BAM-C
Koala	Phascolarctos cinereus	Habitat constraints
Little Eagle	Hieraaetus morphnoides	Habitat constraints
Masked Owl	Tyto novaehollandiae	Habitat constraints
Pink Cockatoo	Lophochroa leadbeateri	Refer to BAR
Pink-tailed Legless Lizard	Aprasia parapulchella	Refer to BAR
Plains-wanderer	Pedionomus torquatus	Refer to BAR
Pterostylis pedina	Pterostylis pedina	Refer to BAR
Square-tailed Kite	Lophoictinia isura	Habitat constraints
Superb Parrot	Polytelis swainsonii	Refer to BAR
Swift Parrot	Lathamus discolor	Refer to BAR
White-bellied Sea-Eagle	Haliaeetus leucogaster	Habitat constraints

BAM Predicted Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00047237/BAAS19078/26/00063696	VNI Stage 1 Dinawan	09/04/2026
Assessor Name	**Report Created**	**BAM Data version ***
Devon T Raiff	01/06/2026	Current classification (live - default) (94)
Assessor Number	**Assessment Type**	**BAM Case Status**
BAAS23009	Major Projects	Finalised
Assessment Revision	**BOS entry trigger**	**Date Finalised**
1		18/05/2026

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Threatened species reliably predicted to utilise the site. No surveys are required for these species. Ecosystem credits apply to these species.

Common Name	Scientific Name	Vegetation Types(s)
Black Falcon	Falco subniger	26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion
Blue-winged Parrot	Neophema chrysostoma	26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion
Brolga	Antigone rubicunda	26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
Diamond Firetail	Stagonopleura guttata	26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
		44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion

Dusky Woodswallow	Artamus cyanopterus cyanopterus	26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion
Grey Falcon	Falco hypoleucos	26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion
Grey-crowned Babbler (eastern subspecies)	Pomatostomus temporalis temporalis	26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
Latham's Snipe	Gallinago hardwickii	26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion
Little Eagle	Hieraaetus morphnoides	26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion
Little Pied Bat	Chalinolobus picatus	26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
Painted Honeyeater	Grantiella picta	26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
Pied Honeyeater	Certhionyx variegatus	26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
Pink Cockatoo	Lophochroa leadbeateri	26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
Plains-wanderer	Pedionomus torquatus	44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion

Scarlet Robin	Petroica boodang	26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
South-eastern Hooded Robin	Melanodryas cucullata cucullata	26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
Southern Whiteface	Aphelocephala leucopsis	26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion
Spotted Harrier	Circus assimilis	26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion
Square-tailed Kite	Lophoictinia isura	26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
Superb Parrot	Polytelis swainsonii	26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
Swift Parrot	Lathamus discolor	26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
Varied Sittella	Daphoenositta chrysoptera	26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
White-fronted Chat	Epthianura albifrons	216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion
White-throated Needletail	Hirundapus caudacutus	26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion
Yellow-bellied Sheathtail-bat	Saccolaimus flaviventris	26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion

Threatened species Manually Added

None added

BAM Predicted Species Report

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Common Name	Scientific Name	Plant Community Type(s)
White-bellied Sea-Eagle	Haliaeetus leucogaster	26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Refer to BAR for detailed justification

Common Name	Scientific Name	Justification in the BAM-C
White-bellied Sea-Eagle	Haliaeetus leucogaster	Refer to BAR

BAM Vegetation Zones Report

Proposal Details

Assessment Id
00047237/BAAS19078/26/00063696

Assessment name
VNI Stage 1 Dinawan

BAM data last updated *
09/04/2026

Assessor Name
Devon T Raiff

Report Created
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Assessor Number
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Assessment Type
Major Projects

BAM Case Status
Finalised

Assessment Revision
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BOS entry trigger

Date Finalised
18/05/2026

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Vegetation Zones

#	Name	PCT	Condition	Area	Minimum number of plots	Management zones
1	26_Derived	26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion	Derived	42.72	4	Dist_AreaA (42.72 ha)

2	216_Moderate-good	216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion	Moderate-good	5.22	3	Dist_AreaA (5.22 ha)
3	44_SVTM	44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion	SVTM	0.17	1	Dist_AreaA (0.17 ha)
4	26_Moderate-good	26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion	Moderate-good	0.01	1	Dist_AreaA (0.01 ha)

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id
00047237/BAAS19078/26/00063696

Proposal Name
VNI Stage 1 Dinawan

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Assessor Name
Devon T Raiff

Assessor Number
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Proponent Names

Report Created
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Assessment Type
Major Projects

Date Finalised
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Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
Nil		

Species
Convolvulus tedmoorei / Bindweed
Brachyscome muelleroides / Claypan Daisy

Additional Information for Approval

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
Haliaeetus leucogaster / White-bellied Sea-Eagle

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

BAM Biodiversity Credit Report (Like for like)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion	Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions	42.7	0	593	593
216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion	Not a TEC	5.2	0	173	173
44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion	Natural Grasslands of the Murray Valley Plains	0.2	0	11	11

26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion

Like-for-like credit retirement options

Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions This includes PCT's: 26, 27, 37, 43, 49, 55, 145, 159, 1766	-	26_Derived	No	592	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions This includes PCT's: 26, 27, 37, 43, 49, 55, 145, 159, 1766	-	26_Moderate-good	No	1	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion	**Like-for-like credit retirement options**					
	Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
	Natural Grasslands of the Murray Valley Plains This includes PCT's: 44, 45, 46	-	44_SVTM	No	11	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

BAM Biodiversity Credit Report (Like for like)

216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Riverine Chenopod Shrublands This includes PCT's: 157, 158, 159, 163, 164, 168, 195, 196, 211, 212, 216, 236, 254, 377, 466	Riverine Chenopod Shrublands <50%	216_Moderate-good	No	173	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

Species	Vegetation Zone/s	Area / Count	Credits
Austrostipa wakoolica / A spear-grass	**26_Derived, 26_Moderate-good**	42.7	593.00
Brachyscome muelleroides / Claypan Daisy	**44_SVTM**	0.2	13.00
Brachyscome papillosa / Mossgiel Daisy	**216_Moderate-good, 44_SVTM**	3.5	158.00
Convolvulus tedmoorei / Bindweed	**44_SVTM**	0.2	13.00

Cullen parvum / Small Scurf-pea	**44_SVTM**	0.2	9.00
Eleocharis obicis / Spike-Rush	**216_Moderate-good**	3.4	149.00
Lepidium monoplocoides / Winged Peppercress	**26_Derived, 216_Moderate-good, 26_Moderate-good**	30.0	519.00
Leptorhynchos orientalis / Lanky Buttons	**26_Derived, 44_SVTM, 26_Moderate-good**	26.8	379.00
Maireana cheelii / Chariot Wheels	**26_Derived, 44_SVTM, 26_Moderate-good**	26.8	379.00
Pilularia novae-hollandiae / Austral Pillwort	**26_Derived, 44_SVTM, 26_Moderate-good**	26.8	379.00
Sclerolaena napiformis / Turnip Copperburr	**26_Derived, 44_SVTM, 26_Moderate-good**	26.8	379.00
Swainsona murrayana / Slender Darling Pea	**26_Derived, 216_Moderate-good, 44_SVTM, 26_Moderate-good**	30.2	528.00
Swainsona plagiotropis / Red Darling Pea	**26_Derived, 44_SVTM, 26_Moderate-good**	26.8	379.00
Swainsona sericea / Silky Swainson-pea	**26_Derived, 44_SVTM, 26_Moderate-good**	26.8	379.00

Credit Retirement Options

Like-for-like credit retirement options

	Spp	IBRA subregion
Austrostipa wakoolica / A spear-grass		

	Austrostipa wakoolica / A spear-grass	Any in NSW
Brachyscome muelleroides / Claypan Daisy	Spp	IBRA subregion
	Brachyscome muelleroides / Claypan Daisy	Any in NSW
Brachyscome papillosa / Mossgiel Daisy	Spp	IBRA subregion
	Brachyscome papillosa / Mossgiel Daisy	Any in NSW
Convolvulus tedmoorei / Bindweed	Spp	IBRA subregion
	Convolvulus tedmoorei / Bindweed	Any in NSW
Cullen parvum / Small Scurf-pea	Spp	IBRA subregion
	Cullen parvum / Small Scurf-pea	Any in NSW
Eleocharis obicis / Spike-Rush	Spp	IBRA subregion
	Eleocharis obicis / Spike-Rush	Any in NSW
Lepidium monoplocoides / Winged Peppercress	Spp	IBRA subregion
	Lepidium monoplocoides / Winged Peppercress	Any in NSW

Leptorhynchos orientalis / Lanky Buttons	Spp	IBRA subregion
	Leptorhynchos orientalis / Lanky Buttons	Any in NSW
Maireana cheelii / Chariot Wheels	Spp	IBRA subregion
	Maireana cheelii / Chariot Wheels	Any in NSW
Pilularia novae-hollandiae / Austral Pillwort	Spp	IBRA subregion
	Pilularia novae-hollandiae / Austral Pillwort	Any in NSW
Sclerolaena napiformis / Turnip Copperburr	Spp	IBRA subregion
	Sclerolaena napiformis / Turnip Copperburr	Any in NSW
Swainsona murrayana / Slender Darling Pea	Spp	IBRA subregion
	Swainsona murrayana / Slender Darling Pea	Any in NSW
Swainsona plagiotropis / Red Darling Pea	Spp	IBRA subregion
	Swainsona plagiotropis / Red Darling Pea	Any in NSW
Swainsona sericea / Silky Swainson-pea	Spp	IBRA subregion

	Swainsona sericea / Silky Swainson-pea	Any in NSW

BAM Credit Summary Report

Proposal Details

Assessment Id
00053398/BAAS23009/24/00053401

Proposal Name
VNI Stage 2 Murray Fans

BAM data last updated *
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Devon T Raiff

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BOS entry trigger

Assessment Type
Major Projects

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Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

Zone	Vegetation zone name	TEC name	Current Vegetation integrity score	Change in Vegetation integrity (loss / gain)	Area (ha)	Sensitivity to loss (Justification)	Species sensitivity to gain class	BC Act Listing status	EPBC Act listing status	Biodiversity risk weighting	Potential SAII	Ecosystem credits
Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)												
5	13_Derived_No_Offset	Not a TEC	12.6	12.6	87.3	PCT Cleared - 57%	High Sensitivity to Gain			1.75		0

6	13_Moderate-good	Not a TEC	56.2	56.2	93.3	PCT Cleared - 57%	High Sensitivity to Gain			1.75		2293
20	13_Native_plantings	Not a TEC	70.2	70.2	0.2	PCT Cleared - 57%	High Sensitivity to Gain			1.75		6
											Subtotal	**2299**
Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)												
7	15_Derived_No_Offset	Not a TEC	11.2	11.2	10.6	PCT Cleared - 50%	High Sensitivity to Gain			1.75		0
8	15_Moderate-good	Not a TEC	72.3	72.3	11.3	PCT Cleared - 50%	High Sensitivity to Gain			1.75		359
9	15_Thinned	Not a TEC	37.5	37.5	2.9	PCT Cleared - 50%	High Sensitivity to Gain			1.75		48
											Subtotal	**407**
Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion												
16	216_Moderate-good	Not a TEC	75.3	75.3	0.91	PCT Cleared - 0%	High Sensitivity to Gain			1.50		26
											Subtotal	**26**

Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)												
24	20_Thinned01	Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions	100	100.0	0.03	Environment Protection and Conservation Act listing status	High Sensitivity to Gain	Not Listed	Endangered	2.00		2
											Subtotal	**2**
Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones												
22	170_Derived	Not a TEC	62.6	62.6	0.04	PCT Cleared - 41%	High Sensitivity to Gain			1.50		1
23	170_Thinned	Not a TEC	100	100.0	0.01	PCT Cleared - 41%	High Sensitivity to Gain			1.50		1
											Subtotal	**2**
Cotton Bush open shrubland of the semi-arid (warm) zone												
15	164_Moderate-good	Not a TEC	87.6	87.6	9.9	PCT Cleared - 8%	High Sensitivity to Gain			1.50		325
											Subtotal	**325**

Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones												
14	163_Moderate-good	Not a TEC	83.2	83.2	15.8	PCT Cleared - 26%	High Sensitivity to Gain			1.50		492
											Subtotal	**492**
Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion												
19	44_SVTM	Natural Grasslands of the Murray Valley Plains	100	100.0	0.01	Environment Protection and Conservation Act listing status	High Sensitivity to Gain	Not Listed	Critically Endangered	2.50		1
											Subtotal	**1**
Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)												
10	17_Moderate-good	Not a TEC	64.8	64.8	0.13	PCT Cleared - 63%	High Sensitivity to Gain			1.75		4
											Subtotal	**4**

Nitre Goosefoot shrubland wetland on clays of the inland floodplains												
13	160_Moderate-good	Not a TEC	46.2	46.2	0.13	PCT Cleared - 28%	High Sensitivity to Gain			1.50		2
											Subtotal	**2**
River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)												
2	10_Derived_No_offset	Not a TEC	4.7	4.7	12.2	PCT Cleared - 43%	High Sensitivity to Gain			1.50		0
3	10_Thinned	Not a TEC	33.5	32.7	24.6	PCT Cleared - 43%	High Sensitivity to Gain			1.50		301
18	10_SVTM	Not a TEC	100	100.0	0.14	PCT Cleared - 43%	High Sensitivity to Gain			1.50		5
											Subtotal	**306**
River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)												
4	11_Moderate-good	Not a TEC	42.3	40.5	0.46	PCT Cleared - 42%	High Sensitivity to Gain			1.50		7
											Subtotal	**7**

River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion												
1	7_Moderate-good	Not a TEC	74.7	73.0	5.1	PCT Cleared - 15%	High Sensitivity to Gain			1.50		139
											Subtotal	**139**
Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone												
17	237_Moderate-good	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	64	61.2	0.59	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00		18
											Subtotal	**18**
White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone												
11	28_Derived	Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions	6.1	6.1	0.82	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00		0

12	28_Derived_TS	Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions	37.5	23.9	0.75	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00		9
											Subtotal	**9**
Yellow Gum tall woodland of the Murray River floodplain, Riverina Bioregion												
21	86_Moderate_good	Not a TEC	41.3	41.3	0.03	PCT Cleared - 75%	High Sensitivity to Gain			2.00		1
											Subtotal	**1**
											Total	**4040**

Species credits for threatened species

Vegetation zone name	Habitat condition (Vegetation Integrity)	Change in habitat condition	Area (ha)/Count (no. individuals)	Sensitivity to loss (Justification)	Sensitivity to gain (Justification)	BC Act Listing status	EPBC Act listing status	Potential SAII	Species credits

Amphibromus fluitans / Floating Swamp Wallaby-grass (Flora)									
11_Moderate-good	40.5	40.5	0.46	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Vulnerable	False	9
17_Moderate-good	64.8	64.8	0.13	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Vulnerable	False	4
160_Moderate-good	46.2	46.2	0.13	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Vulnerable	False	3
								Subtotal	**16**
Austrostipa metatoris / A spear-grass (Flora)									
7_Moderate-good	73.0	73.0	1	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Vulnerable	Vulnerable	False	38
20_Thinned01	100.0	100.0	0.03	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Vulnerable	Vulnerable	False	2
								Subtotal	**40**

Austrostipa wakoolica / A spear-grass (Flora)									
17_Moderate-good	64.8	64.8	0.03	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	1
28_Derived	6.1	6.1	0.53	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	2
								Subtotal	**3**
Burhinus grallarius / Bush Stone-curlew (Fauna)									
7_Moderate-good	73.0	73.0	0.93	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Not Listed	False	34
10_Thinned	32.7	32.7	5.4	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Not Listed	False	88
13_Moderate-good	56.2	56.2	51.4	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Not Listed	False	1445

15_Moderate-good	72.3	72.3	0.06	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Not Listed	False	2
15_Thinned	37.5	37.5	0.02	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Not Listed	False	1
237_Moderate-good	61.2	61.2	0.31	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Not Listed	False	9
								Subtotal	**1579**
Crinia sloanei / Sloane's Froglet (Fauna)									
237_Moderate-good	61.2	61.2	0.59	Geographic Distribution	Ability to colonise improved habitat	Endangered	Endangered	True	27
								Subtotal	**27**
Eleocharis obicis / Spike-Rush (Flora)									
10_Thinned	32.7	32.7	11.9	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Vulnerable	Vulnerable	False	195

13_Moderate-good	56.2	56.2	37.8	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Vulnerable	Vulnerable	False	1061
17_Moderate-good	64.8	64.8	0.03	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Vulnerable	Vulnerable	False	1
163_Moderate-good	83.2	83.2	0.45	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Vulnerable	Vulnerable	False	19
216_Moderate-good	75.3	75.3	0.13	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Vulnerable	Vulnerable	False	5
10_SVTM	100.0	100.0	0.14	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Vulnerable	Vulnerable	False	7
13_Native_plantings	70.2	70.2	0.2	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Vulnerable	Vulnerable	False	7

								Subtotal	**1295**
Eucalyptus leucoxylon subsp. pruinosa / Yellow Gum (Flora)									
13_Moderate-good	N/A	N/A	1	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Not Listed	False	2
15_Moderate-good	N/A	N/A	1	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Not Listed	False	2
								Subtotal	**4**
Haliaeetus leucogaster / White-bellied Sea-Eagle (Fauna)									
7_Moderate-good	74.7	74.7	1.1	Biodiversity Conservation Act listing status	Fecundity – age at which females first produce	Vulnerable	Not Listed	False	42
10_Thinned	33.5	33.5	8.5	Biodiversity Conservation Act listing status	Fecundity – age at which females first produce	Vulnerable	Not Listed	False	142
13_Moderate-good	56.2	56.2	37.5	Biodiversity Conservation Act listing status	Fecundity – age at which females first produce	Vulnerable	Not Listed	False	1052
								Subtotal	**1236**

Hamirostra melanosternon / Black-breasted Buzzard (Fauna)									
7_Moderate-good	74.7	74.7	0.53	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Not Listed	False	15
10_Thinned	33.5	33.5	1.5	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Not Listed	False	19
13_Moderate-good	56.2	56.2	1.5	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Not Listed	False	32
								Subtotal	**66**
Hieraaetus morphnoides / Little Eagle (Fauna)									
7_Moderate-good	74.7	74.7	1.1	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Not Listed	False	31
10_Thinned	33.5	33.5	11.2	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Not Listed	False	141

13_Moderate-good	56.2	56.2	30.8	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Not Listed	False	650
								Subtotal	**822**
Lepidium monoplocoides / Winged Peppercress (Flora)									
13_Moderate-good	56.2	56.2	7.1	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	199
15_Moderate-good	72.3	72.3	1.2	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	43
163_Moderate-good	83.2	83.2	0.34	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	14
216_Moderate-good	75.3	75.3	0.12	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	5

13_Native_plantings	70.2	70.2	0.2	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	7
170_Derived	62.6	62.6	0.04	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	1
170_Thinned	100.0	100.0	0.01	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	1
								Subtotal	**270**
Litoria raniformis / Southern Bell Frog (Fauna)									
7_Moderate-good	73.0	73.0	3.4	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Vulnerable	False	122
10_Thinned	32.7	32.7	5.6	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Vulnerable	False	91

11_Moderate-good	40.5	40.5	0.46	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Vulnerable	False	9
13_Moderate-good	56.2	56.2	19.3	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Vulnerable	False	542
15_Moderate-good	72.3	72.3	1.8	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Vulnerable	False	67
237_Moderate-good	61.2	61.2	0.59	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Vulnerable	False	18
10_Derived_No_offset	4.7	4.7	0.18	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Vulnerable	False	1
13_Derived_No_Offset	12.6	12.6	3.1	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Vulnerable	False	19

13_Native_plantings	70.2	70.2	0.2	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Vulnerable	False	7
								Subtotal	**876**
Lophochroa leadbeateri / Pink Cockatoo (Fauna)									
7_Moderate-good	74.7	74.7	1.1	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Endangered	False	42
10_Thinned	33.5	33.5	11.2	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Endangered	False	189
13_Moderate-good	56.2	56.2	31.1	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Endangered	False	873
								Subtotal	**1104**
Lophoictinia isura / Square-tailed Kite (Fauna)									
7_Moderate-good	74.7	74.7	1.1	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Not Listed	False	31

10_Thinned	33.5	33.5	11.2	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Not Listed	False	141
13_Moderate-good	56.2	56.2	30.8	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Not Listed	False	650
								Subtotal	**822**
Maireana cheelii / Chariot Wheels (Flora)									
15_Moderate-good	72.3	72.3	1.2	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	43
44_SVTM	100.0	100.0	0.01	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	1
								Subtotal	**44**
Myotis macropus / Southern Myotis (Fauna)									
7_Moderate-good	73.0	73.0	2.8	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	102

10_Thinned	32.7	32.7	6.1	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	99
11_Moderate-good	40.5	40.5	0.46	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	9
13_Moderate-good	56.2	56.2	1.7	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	47
15_Moderate-good	72.3	72.3	1.3	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	48
17_Moderate-good	64.8	64.8	0.13	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	4
237_Moderate-good	61.2	61.2	0.59	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	18
								Subtotal	**327**

Phascolarctos cinereus / Koala (Fauna)									
7_Moderate-good	74.7	74.7	5.1	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	190
10_Thinned	33.5	33.5	22.6	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	379
11_Moderate-good	42.3	42.3	0.46	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	10
13_Moderate-good	56.2	56.2	93.3	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	2621
15_Moderate-good	72.3	72.3	10.9	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	393

15_Thinned	37.5	37.5	2.9	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	54
237_Moderate-good	64.0	64.0	0.59	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	19
10_SVTM	100.0	100.0	0.14	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	7
13_Native_plantings	70.2	70.2	0.2	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	7
								Subtotal	**3680**
Pilularia novae-hollandiae / Austral Pillwort (Flora)									
13_Moderate-good	56.2	56.2	7.1	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Endangered	Not Listed	False	199

15_Moderate-good	72.3	72.3	1.2	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Endangered	Not Listed	False	43
44_SVTM	100.0	100.0	0.01	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Endangered	Not Listed	False	1
13_Native_plantings	70.2	70.2	0.2	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Endangered	Not Listed	False	7
								Subtotal	**250**
Prasophyllum sp. Moama / Prasophyllum sp. Moama (Flora)									
44_SVTM	100.0	100.0	0.01	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Critically Endangered	Not Listed	True	1
								Subtotal	**1**
Pterostylis despectans / Pterostylis despectans (Flora)									
44_SVTM	100.0	100.0	0.01	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Critically Endangered	Endangered	True	1

20_Thinned01	100.0	100.0	0.03	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Critically Endangered	Endangered	True	2
								Subtotal	**3**
Swainsona sericea / Silky Swainson-pea (Flora)									
44_SVTM	100.0	100.0	0.01	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Not Listed	False	1
								Subtotal	**1**

BAM Candidate Species Report

Proposal Details

Assessment Id 00053398/BAAS23009/24/00053401	Proposal Name VNI Stage 2 Murray Fans	BAM data last updated * 09/04/2026
Assessor Name Devon T Raiff	Report Created 01/06/2026	BAM Data version * Current classification (live - default) (94)
Assessor Number BAAS23009	Assessment Type Major Projects	BAM Case Status Finalised
Assessment Revision 9	BOS entry trigger	Date Finalised 18/05/2026

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

List of Species Requiring Survey

Name	Presence	Survey Months
Amphibromus fluitans Floating Swamp Wallaby-grass	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Ardeotis australis Australian Bustard	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Austrostipa metatoris A spear-grass	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Austrostipa wakoolica A spear-grass	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Burhinus grallarius Bush Stone-curlew	Yes (surveyed)	☐ Jan ☐ Feb ☐ Mar ☑ Apr ☐ May ☐ Jun ☐ Jul ☑ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Crinia sloanei Sloane's Froglet	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Eleocharis obicis Spike-Rush	Yes (surveyed) *Survey months are outside of the months specified in Bionet.	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☑ Sep ☑ Oct ☐ Nov ☐ Dec ☑ Survey month outside the specified months?
Eucalyptus leucoxylon subsp. pruinosa Yellow Gum	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Haliaeetus leucogaster White-bellied Sea-Eagle	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Hamirostra melanosternon Black-breasted Buzzard	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Hemiaspis damelii Grey Snake	No (surveyed)	☑ Jan ☑ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Hieraaetus morphnoides Little Eagle	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Lepidium monoplocoides Winged Peppercress	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Litoria raniformis Southern Bell Frog	Yes (surveyed) *Survey months are outside of the months specified in Bionet.	☑ Jan ☑ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☑ Survey month outside the specified months?
Lophochroa leadbeateri Pink Cockatoo	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Lophoictinia isura Square-tailed Kite	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Maireana cheelii Chariot Wheels	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Myotis macropus Southern Myotis	Yes (surveyed)	☐ Jan ☑ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Ninox connivens Barking Owl	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☑ Apr ☐ May ☐ Jun ☐ Jul ☑ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Petaurus norfolcensis Squirrel Glider	No (expert report)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Phascogale tapoatafa Brush-tailed Phascogale	No (expert report)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Phascolarctos cinereus Koala	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Pilularia novae-hollandiae Austral Pillwort	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Polytelis swainsonii Superb Parrot	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Prasophyllum sp. Moama Prasophyllum sp. Moama	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Pterostylis despectans Pterostylis despectans	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Swainsona sericea Silky Swainson-pea	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Tyto novaehollandiae Masked Owl	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☑ Apr ☐ May ☐ Jun ☐ Jul ☑ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Threatened species Manually Added

Common Name	Scientific Name
Spike-Rush	Eleocharis obicis
Grey Snake	Hemiaspis damelii

Threatened species assessed as not on site

Refer to BAR for detailed justification

Common name	Scientific name	Justification in the BAM-C
A saltbush	Atriplex infrequens	Refer to BAR
Claypan Daisy	Brachyscome muelleroides	Refer to BAR
Formbe Peppercress	Lepidium pseudopapillosum	Refer to BAR
Plains-wanderer	Pedionomus torquatus	Habitat constraints
Red Darling Pea	Swainsona plagiotropis	Refer to BAR
Regent Honeyeater	Anthochaera phrygia	Habitat constraints
Regent Parrot (eastern subspecies)	Polytelis anthopeplus monarchoides	Refer to BAR
Slender Darling Pea	Swainsona murrayana	Refer to BAR
Small Scurf-pea	Cullen parvum	Refer to BAR
Swift Parrot	Lathamus discolor	Habitat constraints
Turnip Copperburr	Sclerolaena napiformis	Refer to BAR

BAM Predicted Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00053398/BAAS23009/24/00053401	VNI Stage 2 Murray Fans	09/04/2026
Assessor Name	**Report Created**	**BAM Data version ***
Devon T Raiff	01/06/2026	Current classification (live - default) (94)
Assessor Number	**Assessment Type**	**BAM Case Status**
BAAS23009	Major Projects	Finalised
Assessment Revision	**BOS entry trigger**	**Date Finalised**
9		18/05/2026

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Threatened species reliably predicted to utilise the site. No surveys are required for these species. Ecosystem credits apply to these species.

Common Name	Scientific Name	Vegetation Types(s)
Australasian Bittern	Botaurus poiciloptilus	10-River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
Australian Painted Snipe	Rostratula australis	7-River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion
		10-River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

Australian Painted Snipe	Rostratula australis	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
Black Falcon	Falco subniger	7-River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion
		10-River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
		163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones
		164-Cotton Bush open shrubland of the semi-arid (warm) zone

Black Falcon	Falco subniger	216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		237-Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone
		44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion
		170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Black-breasted Buzzard	Hamirostra melanosternon	7-River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion
		10-River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
		163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones

Black-breasted Buzzard	Hamirostra melanosternon	20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Black-chinned Honeyeater (eastern subspecies)	Melithreptus gularis gularis	7-River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion
		11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		237-Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone
		86-Yellow Gum tall woodland of the Murray River floodplain, Riverina Bioregion
Blue-billed Duck	Oxyura australis	17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
Blue-winged Parrot	Neophema chrysostoma	7-River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion
		11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
		163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones

Blue-winged Parrot	Neophema chrysostoma	164-Cotton Bush open shrubland of the semi-arid (warm) zone
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion
		170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
Brolga	Antigone rubicunda	7-River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion
		10-River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
		163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones
Brown Treecreeper (eastern subspecies)	Climacteris picumnus victoriae	237-Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone
Corben's Long-eared Bat	Nyctophilus corbeni	10-River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		86-Yellow Gum tall woodland of the Murray River floodplain, Riverina Bioregion

Corben's Long-eared Bat	Nyctophilus corbeni	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Diamond Firetail	Stagonopleura guttata	7-River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion
		10-River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		237-Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone
		44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion
		86-Yellow Gum tall woodland of the Murray River floodplain, Riverina Bioregion
		170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Dusky Woodswallow	Artamus cyanopterus cyanopterus	7-River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion
		10-River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

Dusky Woodswallow	Artamus cyanopterus cyanopterus	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
		163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones
		164-Cotton Bush open shrubland of the semi-arid (warm) zone
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		237-Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone
		44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion
		86-Yellow Gum tall woodland of the Murray River floodplain, Riverina Bioregion
		170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Flame Robin	Petroica phoenicea	7-River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion
Freckled Duck	Stictonetta naevosa	7-River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion
		10-River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

Freckled Duck	Stictonetta naevosa	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
Gilbert's Whistler	Pachycephala inornata	10-River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
Grey Falcon	Falco hypoleucos	10-River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

Grey Falcon	Falco hypoleucos	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
		163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones
		164-Cotton Bush open shrubland of the semi-arid (warm) zone
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		237-Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone
		44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion
		170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Grey-crowned Babbler (eastern subspecies)	Pomatostomus temporalis temporalis	10-River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone

Grey-crowned Babbler (eastern subspecies)	Pomatostomus temporalis temporalis	237-Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone
		86-Yellow Gum tall woodland of the Murray River floodplain, Riverina Bioregion
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Latham's Snipe	Gallinago hardwickii	7-River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion
		10-River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
		163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones
		164-Cotton Bush open shrubland of the semi-arid (warm) zone
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		237-Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone
		44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion

Latham's Snipe	Gallinago hardwickii	86-Yellow Gum tall woodland of the Murray River floodplain, Riverina Bioregion
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Little Eagle	Hieraaetus morphnoides	7-River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion
		10-River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
		163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones
		164-Cotton Bush open shrubland of the semi-arid (warm) zone
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		237-Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone
		44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion
		86-Yellow Gum tall woodland of the Murray River floodplain, Riverina Bioregion

Little Eagle	Hieraaetus morphnoides	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Little Lorikeet	Parvipsitta pusilla	7-River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion
Little Pied Bat	Chalinolobus picatus	7-River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion
		10-River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
		163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones
		164-Cotton Bush open shrubland of the semi-arid (warm) zone
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones

Little Pied Bat	Chalinolobus picatus	20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Magpie Goose	Anseranas semipalmata	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
		163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones
Painted Honeyeater	Grantiella picta	7-River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion
		10-River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		237-Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone
		86-Yellow Gum tall woodland of the Murray River floodplain, Riverina Bioregion
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Pied Honeyeater	Certhionyx variegatus	10-River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

Pied Honeyeater	Certhionyx variegatus	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones
		86-Yellow Gum tall woodland of the Murray River floodplain, Riverina Bioregion
		170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Pink Cockatoo	Lophochroa leadbeateri	7-River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion
		10-River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

Pink Cockatoo	Lophochroa leadbeateri	28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones
		237-Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone
		170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Plains-wanderer	Pedionomus torquatus	44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion
Purple-crowned Lorikeet	Parvipsitta porphyrocephala	7-River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion
		10-River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		86-Yellow Gum tall woodland of the Murray River floodplain, Riverina Bioregion
		170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
Regent Honeyeater	Anthochaera phrygia	7-River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion
Scarlet Robin	Petroica boodang	7-River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion
		11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
South-eastern Hooded Robin	Melanodryas cucullata cucullata	7-River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion
		10-River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

South-eastern Hooded Robin	Melanodryas cucullata cucullata	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		237-Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone
		86-Yellow Gum tall woodland of the Murray River floodplain, Riverina Bioregion
		170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Southern Whiteface	Aphelocephala leucopsis	7-River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion
		10-River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

Southern Whiteface	Aphelocephala leucopsis	17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
		163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones
		164-Cotton Bush open shrubland of the semi-arid (warm) zone
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		237-Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone
		44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion
		170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Speckled Warbler	Pyrrholaemus sagittatus	237-Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone
Spotted Harrier	Circus assimilis	7-River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion
		10-River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

Spotted Harrier	Circus assimilis	17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
		163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones
		164-Cotton Bush open shrubland of the semi-arid (warm) zone
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		237-Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone
		44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion
		86-Yellow Gum tall woodland of the Murray River floodplain, Riverina Bioregion
		170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Square-tailed Kite	Lophoictinia isura	7-River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion
		10-River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

Square-tailed Kite	Lophoictinia isura	28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		237-Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Superb Parrot	Polytelis swainsonii	7-River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion
		10-River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		237-Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone
Swift Parrot	Lathamus discolor	7-River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion
		10-River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

Swift Parrot	Lathamus discolor	237-Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone
		86-Yellow Gum tall woodland of the Murray River floodplain, Riverina Bioregion
Turquoise Parrot	Neophema pulchella	237-Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone
Varied Sittella	Daphoenositta chrysoptera	7-River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion
		10-River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		237-Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone
		86-Yellow Gum tall woodland of the Murray River floodplain, Riverina Bioregion
		170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
White-bellied Sea-Eagle	Haliaeetus leucogaster	7-River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion
		10-River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

White-bellied Sea-Eagle	Haliaeetus leucogaster	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
		163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones
		164-Cotton Bush open shrubland of the semi-arid (warm) zone
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		237-Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone
		44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion
		170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
White-fronted Chat	Epthianura albifrons	17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
		163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones

White-fronted Chat	Epthianura albifrons	164-Cotton Bush open shrubland of the semi-arid (warm) zone
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion
White-throated Needletail	Hirundapus caudacutus	7-River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion
		10-River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		237-Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone
		44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion
Yellow-bellied Sheathtail-bat	Saccolaimus flaviventris	7-River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion
		10-River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

Yellow-bellied Sheathtail-bat	Saccolaimus flaviventris	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
		237-Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone
		170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

Threatened species Manually Added

None added

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Common Name	Scientific Name	Plant Community Type(s)
Regent Parrot (eastern subspecies)	Polytelis anthopeplus monarchoides	10-River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

Regent Parrot (eastern subspecies)	Polytelis anthopeplus monarchoides	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Refer to BAR for detailed justification

Common Name	Scientific Name	Justification in the BAM-C
Regent Parrot (eastern subspecies)	Polytelis anthopeplus monarchoides	Refer to BAR

BAM Vegetation Zones Report

Proposal Details

Assessment Id
00053398/BAAS23009/24/00053401

Assessment name
VNI Stage 2 Murray Fans

BAM data last updated *
09/04/2026

Assessor Name
Devon T Raiff

Report Created
01/06/2026

BAM Data version *
Current classification (live - default) (94)

Assessor Number
BAAS23009

Assessment Type
Major Projects

BAM Case Status
Finalised

Assessment Revision
9

BOS entry trigger

Date Finalised
18/05/2026

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Vegetation Zones

#	Name	PCT	Condition	Area	Minimum number of plots	Management zones
1	7_Moderate-good	7-River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion	Moderate-good	5.09	3	Dist_AreaA (1.47 ha) Dist b4 (2.1 ha) Dist B10 (0.51 ha) Dist_HTZ (1.01 ha)

2	10_Derived_No_offset	10-River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Derived_No_offset	12.2	3	Dist_AreaA (12.2 ha)
3	10_Thinned	10-River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Thinned	24.56	4	Dist_AreaA (10.33 ha) Dist b4 (7.71 ha) Dist B10 (1.93 ha) Dist_HTZ (4.59 ha)
4	11_Moderate-good	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Moderate-good	0.46	1	Dist_AreaA (0.11 ha) Dist b4 (0.21 ha) Dist B10 (0.05 ha) Dist_HTZ (0.09 ha)
5	13_Derived_No_Offset	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Derived_No_Offset	87.34	5	Dist_AreaA (87.34 ha)
6	13_Moderate-good	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Moderate-good	93.3	5	Dist_AreaA (53.52 ha) Dist b4 (32.35 ha) Dist B10 (7.43 ha)

7	15_Derived_No_Offset	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Derived_No_Offset	10.55	3	Dist_AreaA (10.55 ha)
8	15_Moderate-good	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Moderate-good	11.34	3	Dist_AreaA (5.49 ha) Dist b4 (4.82 ha) Dist b10 (1.03 ha)
9	15_Thinned	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Thinned	2.91	2	Dist_AreaA (1.65 ha) Dist b4 (1.03 ha) Dist B10 (0.23 ha)
10	17_Moderate-good	17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Moderate-good	0.13	1	Dist_AreaA (0.13 ha)
11	28_Derived	28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone	Derived	0.82	1	Dist_AreaA (0.82 ha)

12	28_Derived_TS	28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone	Derived_TS	0.75	1	Dist_AreaA (0.34 ha) Dist b4 (0.41 ha)
13	160_Moderate-good	160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains	Moderate-good	0.13	1	Dist_AreaA (0.13 ha)
14	163_Moderate-good	163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones	Moderate-good	15.77	3	Dist_AreaA (15.77 ha)
15	164_Moderate-good	164-Cotton Bush open shrubland of the semi-arid (warm) zone	Moderate-good	9.9	3	Dist_AreaA (9.9 ha)
16	216_Moderate-good	216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion	Moderate-good	0.91	1	Dist_AreaA (0.91 ha)
17	237_Moderate-good	237-Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone	Moderate-good	0.59	1	Dist_AreaA (0.13 ha) Dist b4 (0.26 ha) Dist B10 (0.07 ha) Dist_HTZ (0.13 ha)
18	10_SVTM	10-River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	SVTM	0.14	1	Dist_AreaA (0.14 ha)
19	44_SVTM	44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion	SVTM	0.01	1	Dist_AreaA (0.01 ha)

20	13_Native_plantings	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Native_plantings	0.2	1	Dist_AreaA (0.06 ha) Dist b4 (0.11 ha) Dist B10 (0.03 ha)
21	86_Moderate_good	86-Yellow Gum tall woodland of the Murray River floodplain, Riverina Bioregion	Moderate_good	0.03	1	Dist_AreaA (0.03 ha)
22	170_Derived	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones	Derived	0.04	1	Dist_AreaA (0.04 ha)
23	170_Thinned	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones	Thinned	0.01	1	Dist_AreaA (0.01 ha)
24	20_Thinned01	20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Thinned01	0.03	1	Dist_AreaA (0.03 ha)

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id
00053398/BAAS23009/24/00053401

Proposal Name
VNI Stage 2 Murray Fans

BAM data last updated *
09/04/2026

Assessor Name
Devon T Raiff

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Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
Nil		

Species
Crinia sloanei / Sloane's Froglet
Prasophyllum sp. Moama / Prasophyllum sp. Moama

Pterostylis despectans / Pterostylis despectans

Additional Information for Approval

PCT Outside Ibra Added

PCT
164-Cotton Bush open shrubland of the semi-arid (warm) zone

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
Polytelis anthopeplus monarchoides / Regent Parrot (eastern subspecies)

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
7-River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion	Not a TEC	5.1	139	0	139
10-River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Not a TEC	36.9	301	5	306

11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Not a TEC	0.5	7	0	7
13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Not a TEC	180.8	2293	6	2299
15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Not a TEC	24.8	359	48	407
17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Not a TEC	0.1	0	4	4
28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone	Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions	1.6	0	9	9
160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains	Not a TEC	0.1	0	2	2
163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones	Not a TEC	15.8	0	492	492
164-Cotton Bush open shrubland of the semi-arid (warm) zone	Not a TEC	9.9	0	325	325

216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion	Not a TEC	0.9	0	26	26
237-Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	0.6	18	0	18
44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion	Natural Grasslands of the Murray Valley Plains	0.0	0	1	1
86-Yellow Gum tall woodland of the Murray River floodplain, Riverina Bioregion	Not a TEC	0.0	1	0	1
170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones	Not a TEC	0.1	0	2	2
20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions	0.0	0	2	2

7-River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Inland Riverine Forests This includes PCT's: 2, 5, 7, 8, 9, 10, 11, 36, 78, 79, 112, 233, 234, 249, 356, 362, 4088, 4089	Inland Riverine Forests <50%	7_Moderate-good	Yes	139	Murray Fans, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

7-River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland	
10-River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	**Like-for-like credit retirement options**

Class	Trading group	Zone	HBT	Credits	IBRA region
Inland Riverine Forests This includes PCT's: 2, 5, 7, 8, 9, 10, 11, 36, 78, 79, 112, 233, 234, 249, 356, 362, 4088, 4089	Inland Riverine Forests <50%	10_Derived_No_offset	No	0	Murray Fans, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Inland Riverine Forests This includes PCT's: 2, 5, 7, 8, 9, 10, 11, 36, 78, 79, 112, 233, 234, 249, 356, 362, 4088, 4089	Inland Riverine Forests <50%	10_Thinned	Yes	301	Murray Fans, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Inland Riverine Forests This includes PCT's: 2, 5, 7, 8, 9, 10, 11, 36, 78, 79, 112, 233, 234, 249, 356, 362, 4088, 4089	Inland Riverine Forests <50%	10_SVTM	No	5	Murray Fans, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

10-River Red Gum - Black Box woodland wetland of the sem

11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Inland Riverine Forests This includes PCT's: 2, 5, 7, 8, 9, 10, 11, 36, 78, 79, 112, 233, 234, 249, 356, 362, 4088, 4089	Inland Riverine Forests <50%	11_Moderate-good	Yes	7	Murray Fans, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Inland Floodplain Woodlands This includes PCT's: 13, 15, 16, 83, 438, 454, 630	Inland Floodplain Woodlands >=50% and <70%	13_Derived_No_Offset	No	0	Murray Fans, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	Inland Floodplain Woodlands This includes PCT's: 13, 15, 16, 83, 438, 454, 630	Inland Floodplain Woodlands >=50% and <70%	13_Moderate-good	Yes	2293	Murray Fans, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Inland Floodplain Woodlands This includes PCT's: 13, 15, 16, 83, 438, 454, 630	Inland Floodplain Woodlands >=50% and <70%	13_Native_plantings	No	6	Murray Fans, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	**Like-for-like credit retirement options**					
	Class	Trading group	Zone	HBT	Credits	IBRA region
	Inland Floodplain Woodlands This includes PCT's: 13, 15, 16, 83, 438, 454, 630	Inland Floodplain Woodlands >=50% and <70%	15_Derived_No_Offset	No	0	Murray Fans, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Inland Floodplain Woodlands This includes PCT's: 13, 15, 16, 83, 438, 454, 630	Inland Floodplain Woodlands >=50% and <70%	15_Moderate-good	Yes	359	Murray Fans, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	Inland Floodplain Woodlands This includes PCT's: 13, 15, 16, 83, 438, 454, 630	Inland Floodplain Woodlands >=50% and <70%	15_Thinned	No	48	Murray Fans, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	**Like-for-like credit retirement options**					
	Class	Trading group	Zone	HBT	Credits	IBRA region
	Inland Floodplain Shrublands This includes PCT's: 17, 115, 161, 241, 247, 375	Inland Floodplain Shrublands >=50% and <70%	17_Moderate-good	No	4	Murray Fans, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	**Like-for-like credit retirement options**					
	Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region

	Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions This includes PCT's: 20, 22	-	20_Thinned01	No	2	Murray Fans, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone	**Like-for-like credit retirement options**					
	Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
	Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions This includes PCT's: 19, 21, 28, 48, 75	-	28_Derived	No	0	Murray Fans, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions This includes PCT's: 19, 21, 28, 48, 75	-	28_Derived_TS	No	9	Murray Fans, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion	**Like-for-like credit retirement options**					
	Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
	Natural Grasslands of the Murray Valley Plains This includes PCT's: 44, 45, 46	-	44_SVTM	No	1	Murray Fans, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
86-Yellow Gum tall woodland of the Murray River floodplain, Riverina Bioregion	**Like-for-like credit retirement options**					
	Class	Trading group	Zone	HBT	Credits	IBRA region

	Riverine Sandhill Woodlands This includes PCT's: 19, 20, 21, 22, 23, 28, 48, 75, 86	Riverine Sandhill Woodlands >=70% and <90%	86_Moderate_good	Yes	1	Murray Fans, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains	**Like-for-like credit retirement options**					
	Class	Trading group	Zone	HBT	Credits	IBRA region
	Inland Floodplain Shrublands This includes PCT's: 17, 24, 25, 115, 160, 161, 240, 241, 247, 261, 271, 375	Inland Floodplain Shrublands <50%	160_Moderate-good	No	2	Murray Fans, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones	**Like-for-like credit retirement options**					
	Class	Trading group	Zone	HBT	Credits	IBRA region

	Riverine Chenopod Shrublands This includes PCT's: 157, 158, 159, 163, 164, 168, 195, 196, 211, 212, 216, 236, 254, 377, 466	Riverine Chenopod Shrublands <50%	163_Moderate-good	No	492	Murray Fans, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
164-Cotton Bush open shrubland of the semi-arid (warm) zone	**Like-for-like credit retirement options**					
	Class	Trading group	Zone	HBT	Credits	IBRA region
	Riverine Chenopod Shrublands This includes PCT's: 157, 158, 159, 163, 164, 168, 195, 196, 211, 212, 216, 236, 254, 377, 466	Riverine Chenopod Shrublands <50%	164_Moderate-good	No	325	Murray Fans, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones	**Like-for-like credit retirement options**					
	Class	Trading group	Zone	HBT	Credits	IBRA region

	Sand Plain Mallee Woodlands This includes PCT's: 142, 170, 173, 174, 190, 193, 355, 474	Sand Plain Mallee Woodlands <50%	170_Derived	No	1	Murray Fans, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Sand Plain Mallee Woodlands This includes PCT's: 142, 170, 173, 174, 190, 193, 355, 474	Sand Plain Mallee Woodlands <50%	170_Thinned	No	1	Murray Fans, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion	**Like-for-like credit retirement options**					
	Class	Trading group	Zone	HBT	Credits	IBRA region
	Riverine Chenopod Shrublands This includes PCT's: 157, 158, 159, 163, 164, 168, 195, 196, 211, 212, 216, 236, 254, 377, 466	Riverine Chenopod Shrublands <50%	216_Moderate-good	No	26	Murray Fans, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

237-Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone

Like-for-like credit retirement options

Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions This includes PCT's: 76, 80, 81, 82, 101, 110, 237, 248, 267, 3405	-	237_Moderate-good	Yes	18	Murray Fans, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

Species	Vegetation Zone/s	Area / Count	Credits
Amphibromus fluitans / Floating Swamp Wallaby-grass	**11_Moderate-good, 17_Moderate-good, 160_Moderate-good**	0.7	16.00
Austrostipa metatoris / A spear-grass	**7_Moderate-good, 20_Thinned01**	1.1	40.00

Austrostipa wakoolica / A spear-grass	**17_Moderate-good, 28_Derived**	0.6	3.00
Burhinus grallarius / Bush Stone-curlew	**7_Moderate-good, 10_Thinned, 13_Moderate-good, 15_Moderate-good, 15_Thinned, 237_Moderate-good**	58.1	1579.00
Crinia sloanei / Sloane's Froglet	**237_Moderate-good**	0.6	27.00
Eleocharis obicis / Spike-Rush	**10_Thinned, 13_Moderate-good, 17_Moderate-good, 163_Moderate-good, 216_Moderate-good, 10_SVTM, 13_Native_plantings**	50.7	1295.00
Eucalyptus leucoxylon subsp. pruinosa / Yellow Gum	**13_Moderate-good, 15_Moderate-good**	2.0	4.00
Haliaeetus leucogaster / White-bellied Sea-Eagle	**7_Moderate-good, 10_Thinned, 13_Moderate-good**	47.1	1236.00
Hamirostra melanosternon / Black-breasted Buzzard	**7_Moderate-good, 10_Thinned, 13_Moderate-good**	3.6	66.00
Hieraaetus morphnoides / Little Eagle	**7_Moderate-good, 10_Thinned, 13_Moderate-good**	43.2	822.00

Lepidium monoplocoides / Winged Peppercress	**13_Moderate-good, 15_Moderate-good, 163_Moderate-good, 216_Moderate-good, 13_Native_plantings, 170_Derived, 170_Thinned**	9.0	270.00
Litoria raniformis / Southern Bell Frog	**7_Moderate-good, 10_Thinned, 11_Moderate-good, 13_Moderate-good, 15_Moderate-good, 237_Moderate-good, 10_Derived_No_offset, 13_Derived_No_Offset, 13_Native_plantings**	34.6	876.00
Lophochroa leadbeateri / Pink Cockatoo	**7_Moderate-good, 10_Thinned, 13_Moderate-good**	43.4	1104.00
Lophoictinia isura / Square-tailed Kite	**7_Moderate-good, 10_Thinned, 13_Moderate-good**	43.2	822.00
Maireana cheelii / Chariot Wheels	**15_Moderate-good, 44_SVTM**	1.2	44.00

Myotis macropus / Southern Myotis	**7_Moderate-good, 10_Thinned, 11_Moderate-good, 13_Moderate-good, 15_Moderate-good, 17_Moderate-good, 237_Moderate-good**	13.0	327.00
Phascolarctos cinereus / Koala	**7_Moderate-good, 10_Thinned, 11_Moderate-good, 13_Moderate-good, 15_Moderate-good, 15_Thinned, 237_Moderate-good, 10_SVTM, 13_Native_plantings**	136.2	3680.00
Pilularia novae-hollandiae / Austral Pillwort	**13_Moderate-good, 15_Moderate-good, 44_SVTM, 13_Native_plantings**	8.5	250.00
Prasophyllum sp. Moama / Prasophyllum sp. Moama	**44_SVTM**	0.0	1.00
Pterostylis despectans / Pterostylis despectans	**44_SVTM, 20_Thinned01**	0.0	3.00
Swainsona sericea / Silky Swainson-pea	**44_SVTM**	0.0	1.00

Credit Retirement Options

Like-for-like credit retirement options

	Spp	IBRA subregion
Amphibromus fluitans / Floating Swamp Wallaby-grass		

	Amphibromus fluitans / Floating Swamp Wallaby-grass	Any in NSW
Austrostipa metatoris / A spear-grass	Spp	IBRA subregion
	Austrostipa metatoris / A spear-grass	Any in NSW
Austrostipa wakoolica / A spear-grass	Spp	IBRA subregion
	Austrostipa wakoolica / A spear-grass	Any in NSW
Burhinus grallarius / Bush Stone-curlew	Spp	IBRA subregion
	Burhinus grallarius / Bush Stone-curlew	Any in NSW
Crinia sloanei / Sloane's Froglet	Spp	IBRA subregion
	Crinia sloanei / Sloane's Froglet	Any in NSW
Eleocharis obicis / Spike-Rush	Spp	IBRA subregion
	Eleocharis obicis / Spike-Rush	Any in NSW
Eucalyptus leucoxylon subsp. pruinosa / Yellow Gum	Spp	IBRA subregion
	Eucalyptus leucoxylon subsp. pruinosa / Yellow Gum	Any in NSW

Haliaeetus leucogaster / White-bellied Sea-Eagle	Spp	IBRA subregion
	Haliaeetus leucogaster / White-bellied Sea-Eagle	Any in NSW
Hamirostra melanosternon / Black-breasted Buzzard	Spp	IBRA subregion
	Hamirostra melanosternon / Black-breasted Buzzard	Any in NSW
Hieraaetus morphnoides / Little Eagle	Spp	IBRA subregion
	Hieraaetus morphnoides / Little Eagle	Any in NSW
Lepidium monoplocoides / Winged Peppercress	Spp	IBRA subregion
	Lepidium monoplocoides / Winged Peppercress	Any in NSW
Litoria raniformis / Southern Bell Frog	Spp	IBRA subregion
	Litoria raniformis / Southern Bell Frog	Any in NSW
Lophochroa leadbeateri / Pink Cockatoo	Spp	IBRA subregion
	Lophochroa leadbeateri / Pink Cockatoo	Any in NSW
Lophoictinia isura / Square-tailed Kite	Spp	IBRA subregion

	Lophoictinia isura / Square-tailed Kite	Any in NSW
Maireana cheelii / Chariot Wheels	Spp	IBRA subregion
	Maireana cheelii / Chariot Wheels	Any in NSW
Myotis macropus / Southern Myotis	Spp	IBRA subregion
	Myotis macropus / Southern Myotis	Any in NSW
Phascolarctos cinereus / Koala	Spp	IBRA subregion
	Phascolarctos cinereus / Koala	Any in NSW
Pilularia novae-hollandiae / Austral Pillwort	Spp	IBRA subregion
	Pilularia novae-hollandiae / Austral Pillwort	Any in NSW
Prasophyllum sp. Moama / Prasophyllum sp. Moama	Spp	IBRA subregion
	Prasophyllum sp. Moama / Prasophyllum sp. Moama	Any in NSW
Pterostylis despectans / Pterostylis despectans	Spp	IBRA subregion
	Pterostylis despectans / Pterostylis despectans	Any in NSW

Swainsona sericea / Silky Swainson-pea	Spp	IBRA subregion
	Swainsona sericea / Silky Swainson-pea	Any in NSW

Scattered Tree Report

Proposal Details

Assessment Id
00053398/BAAS18097/25/00056440

Assessment name
VNI - Murray Fans

BAM data last updated *
05/08/2025

Assessor Name
Devon T Raiff

Report Created
19/03/2026

BAM Data version *
Current classification (live - default) (82)

Assessor Number
BAAS23009

BAM Case Status
Open

Date Finalised
To be finalised

Assessment Revision
3

Assessment Type
Scattered Trees

BOS entry trigger
Major Project

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Scattered Trees

PCT code	PCT name	No. of trees	Species	DBHOB Category	Contain hollows	Class	Assessment required
10	River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	1	Eucalyptus largiflorens	>= 50cm	True	3	Visual assessment for hollows, presence of important habitat features and habitat suitability for threatened species

Scattered Tree Report

13	Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	23	Eucalyptus largiflorens	>= 50cm	True	3	Visual assessment for hollows, presence of important habitat features and habitat suitability for threatened species
13	Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	1	Alectryon oleifolius	>= 50cm	False	3	Visual assessment for hollows, presence of important habitat features and habitat suitability for threatened species

BAM Credit Summary Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00053398/BAAS18097/25/00056440	VNI - Murray Fans	05/08/2025
Assessor Name	Report Created	BAM Data version *
Devon T Raiff	19/03/2026	Current classification (live - default) (82)
Assessor Number	BAM Case Status	Date Finalised
BAAS23009	Open	To be finalised
Assessment Revision	BOS entry trigger	Assessment Type
3	Major Project	Scattered Trees

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Scattered Trees Credit Requirement

Class	Contains hollows	Number of trees	Ecosystem credits
13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)			
3	True	23.0	23
3	False	1.0	1
			24
10-River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)			
3	True	1.0	1
			1
			25

Species credits for threatened species

The scattered tree module is not applicable. This species much be assessed using chapter 5 of the BAM and BAM-C development module

Lathamus discolor
Swift Parrot

BAM Predicted Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00053398/BAAS18097/25/00056440	VNI - Murray Fans	05/08/2025
Assessor Name	Report Created	BAM Data version *
Devon T Raiff	19/03/2026	Current classification (live - default) (82)
Assessor Number	BAM Case Status	Date Finalised
BAAS23009	Open	To be finalised
Assessment Revision	BOS entry trigger	Assessment Type
3	Major Project	Scattered Trees

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Threatened species reliably predicted to utilise the site. No surveys are required for these species. Ecosystem credits apply to these species.

Common Name	Scientific Name
Black Falcon	Falco subniger
	Falco subniger
Black-breasted Buzzard	Hamirostra melanosternon
	Hamirostra melanosternon
Dusky Woodswallow	Artamus cyanopterus cyanopterus
	Artamus cyanopterus cyanopterus
Grey Falcon	Falco hypoleucos
	Falco hypoleucos
Grey-crowned Babbler (eastern subspecies)	Pomatostomus temporalis temporalis
	Pomatostomus temporalis temporalis
Little Eagle	Hieraaetus morphnoides
	Hieraaetus morphnoides
Little Pied Bat	Chalinolobus picatus
	Chalinolobus picatus
Painted Honeyeater	Grantiella picta
	Grantiella picta
Pink Cockatoo	Lophochroa leadbeateri
	Lophochroa leadbeateri

Purple-crowned Lorikeet	Glossopsitta porphyrocephala
South-eastern Hooded Robin	Melanodryas cucullata cucullata
	Melanodryas cucullata cucullata
Southern Whiteface	Aphelocephala leucopsis
	Aphelocephala leucopsis
Spotted Harrier	Circus assimilis
	Circus assimilis
Superb Parrot	Polytelis swainsonii
	Polytelis swainsonii
Swift Parrot	Lathamus discolor
	Lathamus discolor
Varied Sittella	Daphoenositta chrysoptera
	Daphoenositta chrysoptera
White-bellied Sea-Eagle	Haliaeetus leucogaster
	Haliaeetus leucogaster
White-throated Needletail	Hirundapus caudacutus
	Hirundapus caudacutus
Yellow-bellied Sheathtail-bat	Saccolaimus flaviventris
	Saccolaimus flaviventris

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Common Name	Scientific Name	Plant Community Type(s)
Regent Parrot (eastern subspecies)	Polytelis anthopeplus monarchoides	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		10-River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Refer to BAR for detailed justification

Common Name	Scientific Name	Justification in the BAM-C
Regent Parrot (eastern subspecies)	Polytelis anthopeplus monarchoides	Refer to BAR

BAM Credit Summary Report

Proposal Details

Assessment Id
00041510/BAAS19078/25/00054312

Proposal Name
VNI Murrumbidgee

BAM data last updated *
09/04/2026

Assessor Name
Devon T Raiff

Report Created
01/06/2026

BAM Data version *
Current classification (live - default) (94)

Assessor Number
BAAS23009

BAM Case Status
Finalised

Date Finalised
18/05/2026

Assessment Revision
10

BOS entry trigger

Assessment Type
Major Projects

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

Zone	Vegetation zone name	TEC name	Current Vegetation integrity score	Change in Vegetation integrity (loss / gain)	Area (ha)	Sensitivity to loss (Justification)	Species sensitivity to gain class	BC Act Listing status	EPBC Act listing status	Biodiversity risk weighting	Potential SAII	Ecosystem credits
Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)												
1	13_Moderate_good	Not a TEC	77.4	77.4	3.6	PCT Cleared - 57%	High Sensitivity to Gain			1.75		122

29	13_SVTM	Not a TEC	100	43.3	0.28	PCT Cleared - 57%	High Sensitivity to Gain			1.75		5
42	13_Derived	Not a TEC	10.8	10.8	0.08	PCT Cleared - 57%	High Sensitivity to Gain			1.75		0
											Subtotal	**127**
Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)												
2	15_Derived	Not a TEC	27.6	27.6	6.1	PCT Cleared - 50%	High Sensitivity to Gain			1.75		73
3	15_Moderate_good	Not a TEC	70.6	70.6	59.9	PCT Cleared - 50%	High Sensitivity to Gain			1.75		1851
30	15_SVTM	Not a TEC	100	100.0	2	PCT Cleared - 50%	High Sensitivity to Gain			1.75		87
											Subtotal	**2011**
Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion												
21	58_Derived	Not a TEC	12.3	12.3	0.01	PCT Cleared - 50%	High Sensitivity to Gain			1.75		0
22	58_Thinned	Not a TEC	51.7	39.3	0.76	PCT Cleared - 50%	High Sensitivity to Gain			1.75		13

											Subtotal	**13**
Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion												
36	216_Moderate_good	Not a TEC	88.1	88.1	1.6	PCT Cleared - 0%	High Sensitivity to Gain			1.50		55
											Subtotal	**55**
Bladder Saltbush shrubland on alluvial plains in the semi-arid (warm) zone including Riverina Bioregion												
23	157_Moderate_good	Not a TEC	90	90.0	95.1	PCT Cleared - 60%	High Sensitivity to Gain			1.75		3742
33	157_SVTM	Not a TEC	100	100.0	0.11	PCT Cleared - 60%	High Sensitivity to Gain			1.75		5
											Subtotal	**3747**
Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)												
5	20_Derived	Allocasuarina luehmannii Woodland in the Riverina and Murray-Darling Depression Bioregions	16.2	16.2	1.8	Population size	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00	True	15

6	20_Thinned	Allocasuarina luehmannii Woodland in the Riverina and Murray-Darling Depression Bioregions	34.9	26.2	0.21	Population size	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00	True	3
											Subtotal	**18**
Canegrass swamp tall grassland wetland of drainage depressions, lakes and pans of the inland plains												
9	24_Moderate_good	Not a TEC	72	72.0	6.3	PCT Cleared - 20%	High Sensitivity to Gain			1.50		169
											Subtotal	**169**
Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones												
27	170_Derived	Not a TEC	12.3	12.3	1.7	PCT Cleared - 41%	High Sensitivity to Gain			1.50		0
28	170_Thinned	Not a TEC	46.6	42.7	2.3	PCT Cleared - 41%	High Sensitivity to Gain			1.50		37
											Subtotal	**37**

Cotton Bush open shrubland of the semi-arid (warm) zone												
26	164_Moderate_good	Not a TEC	86.9	86.9	293	PCT Cleared - 8%	High Sensitivity to Gain			1.50		9551
37	164_SVTM	Not a TEC	100	100.0	4.2	PCT Cleared - 8%	High Sensitivity to Gain			1.50		156
											Subtotal	**9707**
Curly Windmill Grass - speargrass - wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion												
19	46_Moderate_good	Natural Grasslands of the Murray Valley Plains	91.4	91.4	48.1	Environment Protection and Conservation Act listing status	High Sensitivity to Gain	Not Listed	Critically Endangered	2.50		2749
38	46_SVTM	Natural Grasslands of the Murray Valley Plains	100	100.0	14.1	Environment Protection and Conservation Act listing status	High Sensitivity to Gain	Not Listed	Critically Endangered	2.50		879
											Subtotal	**3628**
Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones												
25	163_Moderate_good	Not a TEC	97.7	97.7	62.5	PCT Cleared - 26%	High Sensitivity to Gain			1.50		2289

35	163_SVTM	Not a TEC	100	100.0	4.4	PCT Cleared - 26%	High Sensitivity to Gain			1.50		167
											Subtotal	**2456**
Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion												
17	44_Moderate_good	Natural Grasslands of the Murray Valley Plains	95.5	95.5	15.2	Environment Protection and Conservation Act listing status	High Sensitivity to Gain	Not Listed	Critically Endangered	2.50		905
32	44_SVTM	Natural Grasslands of the Murray Valley Plains	100	100.0	0.02	Environment Protection and Conservation Act listing status	High Sensitivity to Gain	Not Listed	Critically Endangered	2.50		1
											Subtotal	**906**
Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)												
4	17_Moderate_good	Not a TEC	84.7	84.7	6	PCT Cleared - 63%	High Sensitivity to Gain			1.75		224
											Subtotal	**224**

Nitre Goosefoot shrubland wetland on clays of the inland floodplains												
24	160_Moderate_good	Not a TEC	88.7	88.7	14.4	PCT Cleared - 28%	High Sensitivity to Gain			1.50		478
39	160_SVTM	Not a TEC	100	100.0	0.29	PCT Cleared - 28%	High Sensitivity to Gain			1.50		11
											Subtotal	**489**
Old Man Saltbush shrubland mainly of the semi-arid (warm) climate zone (south western NSW)												
34	159_SVTM	Not a TEC	100	100.0	0.21	PCT Cleared - 92%	High Sensitivity to Gain			2.50		13
43	159_Moderate_good	Not a TEC	85.7	85.7	4	PCT Cleared - 92%	High Sensitivity to Gain			2.50		215
											Subtotal	**228**
Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion												
18	45_Moderate_good	Natural Grasslands of the Murray Valley Plains	85.5	85.5	3.5	Environment Protection and Conservation Act listing status	High Sensitivity to Gain	Not Listed	Critically Endangered	2.50		187
											Subtotal	**187**

Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluvial plains and floodplains												
41	53_Moderate_good01	Not a TEC	100	100.0	0.05	PCT Cleared - 67%	High Sensitivity to Gain			1.75		2
											Subtotal	**2**
Swamp grassland wetland of the Riverine Plain												
20	47_Moderate_good	Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains	87.5	87.5	0.19	Environment Protection and Conservation Act listing status	High Sensitivity to Gain	Not Listed	Critically Endangered	2.50		10
											Subtotal	**10**
Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion												
10	26_Derived	Weeping Myall Woodlands	15	15.0	55	Environment Protection and Conservation Act listing status	High Sensitivity to Gain	Not Listed	Endangered	2.00		0

11	26_Native_plantings	Weeping Myall Woodlands	22	22.0	0.01	Environment Protection and Conservation Act listing status	High Sensitivity to Gain	Not Listed	Endangered	2.00		1
12	26_Moderate_good	Weeping Myall Woodlands	76.7	52.2	77.8	Environment Protection and Conservation Act listing status	High Sensitivity to Gain	Not Listed	Endangered	2.00		2030
13	26_Thinned	Weeping Myall Woodlands	53.7	40.1	81	Environment Protection and Conservation Act listing status	High Sensitivity to Gain	Not Listed	Endangered	2.00		1623
40	26_River_Red_Gum	Weeping Myall Woodlands	32.9	17.2	1.2	Environment Protection and Conservation Act listing status	High Sensitivity to Gain	Not Listed	Endangered	2.00		10
											Subtotal	**3664**

White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone												
14	28_Derived	Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions	21	21.0	23.1	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00		242
15	28_Derived_TS	Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions	45	40.8	0.6	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00		12
16	28_Thinned	Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions	23.9	14.4	6.8	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00		49

31	28_SVTM	Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions	100	100.0	3.2	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00		162
											Subtotal	**465**
Yarran tall open shrubland of the sandplains and plains of the semi-arid (warm) and arid climate zones												
7	23_Derived	Acacia melvillei Shrubland in the Riverina and Murray-Darling Depression bioregions	33.2	33.2	6.5	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00		108
8	23_Moderate_good	Acacia melvillei Shrubland in the Riverina and Murray-Darling Depression bioregions	72.4	54.3	3.1	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00		84
											Subtotal	**192**
											Total	**28335**

Species credits for threatened species

Vegetation zone name	Habitat condition (Vegetation Integrity)	Change in habitat condition	Area (ha)/Count (no. individuals)	Sensitivity to loss (Justification)	Sensitivity to gain (Justification)	BC Act Listing status	EPBC Act listing status	Potential SAII	Species credits
Austrostipa wakoolica / A spear-grass (Flora)									
17_Moderate_good	84.7	84.7	0.1	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	4
26_Derived	15.0	15.0	6.5	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	49
26_Moderate_good	52.2	52.2	1.3	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	34
26_Thinned	40.1	40.1	1.8	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	36

28_Derived	21.0	21.0	8.7	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	91
28_Derived_TS	40.8	40.8	0.17	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	3
28_SVTM	100.0	100.0	3.2	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	162
								Subtotal	**379**
Brachyscome muelleroides / Claypan Daisy (Flora)									
44_SVTM	100.0	100.0	0.02	Geographic Distribution	Ability to colonise improved habitat	Vulnerable	Vulnerable	True	2
46_SVTM	100.0	100.0	0.52	Geographic Distribution	Ability to colonise improved habitat	Vulnerable	Vulnerable	True	39
								Subtotal	**41**

Brachyscome papillosa / Mossgiel Daisy (Flora)									
15_Derived	27.6	27.6	0.04	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	1
15_Moderate_good	70.6	70.6	0.4	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	14
46_Moderate_good	91.4	91.4	17.7	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	810
157_Moderate_good	90.0	90.0	5.5	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	246
160_Moderate_good	88.7	88.7	1.8	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	79
163_Moderate_good	97.7	97.7	9.4	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	459
164_Moderate_good	86.9	86.9	84.2	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	3660

13_SVTM	43.3	43.3	0.19	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	4
15_SVTM	100.0	100.0	1	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	52
44_SVTM	100.0	100.0	0.02	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	1
157_SVTM	100.0	100.0	0.11	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	6
159_SVTM	100.0	100.0	0.21	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	11
163_SVTM	100.0	100.0	4.4	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	223
164_SVTM	100.0	100.0	3.8	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	191

46_SVTM	100.0	100.0	13.8	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	688
160_SVTM	100.0	100.0	0.01	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	1
13_Derived	10.8	10.8	0.08	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	1
								Subtotal	**6447**
Burhinus grallarius / Bush Stone-curlew (Fauna)									
23_Moderate_good	54.3	54.3	0.02	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Not Listed	False	1
13_SVTM	43.3	43.3	0.28	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Not Listed	False	6
15_SVTM	100.0	100.0	1.8	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Not Listed	False	89

28_SVTM	100.0	100.0	1.4	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Not Listed	False	72
								Subtotal	**168**
Calotis moorei / A burr-daisy (Flora)									
23_Derived	33.2	33.2	0.01	Geographic Distribution	Ecology or response to management is poorly known	Endangered	Endangered	True	1
23_Moderate_good	54.3	54.3	0.04	Geographic Distribution	Ecology or response to management is poorly known	Endangered	Endangered	True	2
157_Moderate_good	90.0	90.0	1.5	Geographic Distribution	Ecology or response to management is poorly known	Endangered	Endangered	True	101
157_SVTM	100.0	100.0	0.11	Geographic Distribution	Ecology or response to management is poorly known	Endangered	Endangered	True	8
								Subtotal	**112**

Convolvulus tedmoorei / Bindweed (Flora)									
17_Moderate_good	84.7	84.7	0.05	Population size	Ecology or response to management is poorly known	Endangered	Not Listed	True	3
157_Moderate_good	90.0	90.0	13.4	Population size	Ecology or response to management is poorly known	Endangered	Not Listed	True	902
44_SVTM	100.0	100.0	0.02	Population size	Ecology or response to management is poorly known	Endangered	Not Listed	True	2
157_SVTM	100.0	100.0	0.11	Population size	Ecology or response to management is poorly known	Endangered	Not Listed	True	8
159_SVTM	100.0	100.0	0.21	Population size	Ecology or response to management is poorly known	Endangered	Not Listed	True	16

160_SVTM	100.0	100.0	0.29	Population size	Ecology or response to management is poorly known	Endangered	Not Listed	True	22
								Subtotal	**953**
Cullen parvum / Small Scurf-pea (Flora)									
44_Moderate_good	95.5	95.5	2.4	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Endangered	Not Listed	False	115
44_SVTM	100.0	100.0	0.02	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Endangered	Not Listed	False	1
								Subtotal	**116**
Eleocharis obicis / Spike-Rush (Flora)									
17_Moderate_good	84.7	84.7	2.3	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Vulnerable	Vulnerable	False	98
24_Moderate_good	72.0	72.0	4.1	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Vulnerable	Vulnerable	False	148

157_Moderate_good	90.0	90.0	5.3	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Vulnerable	Vulnerable	False	237
160_Moderate_good	88.7	88.7	1.8	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Vulnerable	Vulnerable	False	79
163_Moderate_good	97.7	97.7	8.2	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Vulnerable	Vulnerable	False	402
164_Moderate_good	86.9	86.9	90.6	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Vulnerable	Vulnerable	False	3938
13_SVTM	43.3	43.3	0.19	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Vulnerable	Vulnerable	False	4
157_SVTM	100.0	100.0	0.11	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Vulnerable	Vulnerable	False	6

159_SVTM	100.0	100.0	0.21	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Vulnerable	Vulnerable	False	11
163_SVTM	100.0	100.0	4.4	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Vulnerable	Vulnerable	False	223
164_SVTM	100.0	100.0	3.8	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Vulnerable	Vulnerable	False	191
160_SVTM	100.0	100.0	0.01	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Vulnerable	Vulnerable	False	1
13_Derived	10.8	10.8	0.08	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Vulnerable	Vulnerable	False	1
								Subtotal	**5339**

Eucalyptus leucoxylon subsp. pruinosa / Yellow Gum (Flora)									
13_SVTM	N/A	N/A	1	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Not Listed	False	2
15_SVTM	N/A	N/A	1	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Not Listed	False	2
								Subtotal	**4**
Hieraaetus morphnoides / Little Eagle (Fauna)									
28_SVTM	100.0	100.0	0.28	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Not Listed	False	11
								Subtotal	**11**
Lepidium monoplocoides / Winged Peppercress (Flora)									
15_Derived	27.6	27.6	0.04	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	1
26_Derived	15.0	15.0	1.6	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	12

26_Moderate_good	52.2	52.2	0.81	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	21
26_Thinned	40.1	40.1	0.93	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	19
46_Moderate_good	91.4	91.4	15.2	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	692
160_Moderate_good	88.7	88.7	1.8	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	79
163_Moderate_good	97.7	97.7	7	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	342
13_SVTM	43.3	43.3	0.19	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	4

15_SVTM	100.0	100.0	1	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	52
159_SVTM	100.0	100.0	0.21	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	11
163_SVTM	100.0	100.0	4.4	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	223
46_SVTM	100.0	100.0	13.8	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	688
160_SVTM	100.0	100.0	0.01	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	1
13_Derived	10.8	10.8	0.08	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	1

								Subtotal	2146
Leptorhynchos orientalis / Lanky Buttons (Flora)									
26_Derived	15.0	15.0	1.6	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Not Listed	False	12
26_Moderate_good	52.2	52.2	0.81	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Not Listed	False	21
26_Thinned	40.1	40.1	0.93	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Not Listed	False	19
46_Moderate_good	91.4	91.4	0.01	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Not Listed	False	1
44_SVTM	100.0	100.0	0.02	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Not Listed	False	1

46_SVTM	100.0	100.0	13.8	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Not Listed	False	688
								Subtotal	**742**
Litoria raniformis / Southern Bell Frog (Fauna)									
24_Moderate_good	72.0	72.0	0.03	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Vulnerable	False	1
53_Moderate_good01	100.0	100.0	0.05	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Vulnerable	False	3
								Subtotal	**4**
Lophochroa leadbeateri / Pink Cockatoo (Fauna)									
28_SVTM	100.0	100.0	0.28	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Endangered	False	14
								Subtotal	**14**

Maireana cheelii / Chariot Wheels (Flora)									
15_Derived	27.6	27.6	0.04	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	1
23_Derived	33.2	33.2	0.73	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	12
24_Moderate_good	72.0	72.0	2	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	71
26_Derived	15.0	15.0	1.6	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	12
26_Moderate_good	52.2	52.2	0.81	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	21
26_Thinned	40.1	40.1	0.93	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	19
44_Moderate_good	95.5	95.5	0.72	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	34

46_Moderate_good	91.4	91.4	12.7	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	579
157_Moderate_good	90.0	90.0	5.3	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	240
163_Moderate_good	97.7	97.7	5.3	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	259
164_Moderate_good	86.9	86.9	92.4	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	4017
15_SVTM	100.0	100.0	1	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	52
44_SVTM	100.0	100.0	0.02	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	1
157_SVTM	100.0	100.0	0.11	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	6

164_SVTM	100.0	100.0	3.8	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	191
46_SVTM	100.0	100.0	13.8	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	688
58_Derived	12.3	12.3	0.01	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	1
								Subtotal	**6204**
Myotis macropus / Southern Myotis (Fauna)									
15_Moderate_good	70.6	70.6	0.99	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	35
								Subtotal	**35**
Pedionomus torquatus / Plains-wanderer (Fauna)									
17_Moderate_good	84.7	84.7	0.01	Environment Protection and Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Critically Endangered	True	1

26_Derived	15.0	15.0	0.18	Environment Protection and Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Critically Endangered	True	2
46_Moderate_good	91.4	91.4	0.56	Environment Protection and Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Critically Endangered	True	38
164_Moderate_good	86.9	86.9	0.01	Environment Protection and Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Critically Endangered	True	1
216_Moderate_good	88.1	88.1	0.2	Environment Protection and Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Critically Endangered	True	13
								Subtotal	**55**

Pilularia novae-hollandiae / Austral Pillwort (Flora)									
17_Moderate_good	84.7	84.7	0.49	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Endangered	Not Listed	False	21
26_Derived	15.0	15.0	1.6	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Endangered	Not Listed	False	12
26_Moderate_good	52.2	52.2	18.9	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Endangered	Not Listed	False	493
26_Thinned	40.1	40.1	0.93	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Endangered	Not Listed	False	19
44_SVTM	100.0	100.0	0.02	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Endangered	Not Listed	False	1

46_SVTM	100.0	100.0	0.52	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Endangered	Not Listed	False	26
13_Derived	10.8	10.8	0.08	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Endangered	Not Listed	False	1
								Subtotal	**573**
Sclerolaena napiformis / Turnip Copperburr (Flora)									
26_Derived	15.0	15.0	1.6	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	12
26_Moderate_good	52.2	52.2	0.81	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	21
26_Thinned	40.1	40.1	0.93	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	19

46_Moderate_good	91.4	91.4	0.01	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	1
44_SVTM	100.0	100.0	0.02	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	1
46_SVTM	100.0	100.0	13.8	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	688
								Subtotal	**742**
Solanum karsense / Menindee Nightshade (Flora)									
15_Derived	27.6	27.6	0.04	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Vulnerable	False	1
17_Moderate_good	84.7	84.7	0.08	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Vulnerable	False	3

160_Moderate_good	88.7	88.7	0.5	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Vulnerable	False	17
15_SVTM	100.0	100.0	0.17	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Vulnerable	False	6
13_Derived	10.8	10.8	0.08	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Vulnerable	False	1
								Subtotal	**28**
Swainsona murrayana / Slender Darling Pea (Flora)									
15_Derived	27.6	27.6	0.93	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	13
17_Moderate_good	84.7	84.7	0.38	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	16
23_Derived	33.2	33.2	0.49	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	8

23_Moderate_good	54.3	54.3	0.04	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	1
24_Moderate_good	72.0	72.0	1.1	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	39
26_Derived	15.0	15.0	8.8	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	66
26_Moderate_good	52.2	52.2	12.8	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	334
26_Thinned	40.1	40.1	2.3	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	46
28_Derived	21.0	21.0	4.1	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	43
44_Moderate_good	95.5	95.5	4.7	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	224

46_Moderate_good	91.4	91.4	16.1	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	736
157_Moderate_good	90.0	90.0	36.5	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	1643
163_Moderate_good	97.7	97.7	21	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	1026
164_Moderate_good	86.9	86.9	153.1	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	6654
15_SVTM	100.0	100.0	2	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	100
28_SVTM	100.0	100.0	3.2	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	162
44_SVTM	100.0	100.0	0.02	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	1

157_SVTM	100.0	100.0	0.11	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	6
163_SVTM	100.0	100.0	4.4	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	223
164_SVTM	100.0	100.0	4.2	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	209
46_SVTM	100.0	100.0	14.1	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	703
216_Moderate_good	88.1	88.1	0.12	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	5
159_Moderate_good	85.7	85.7	1.8	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	75
								Subtotal	**12333**

Swainsona plagiotropis / Red Darling Pea (Flora)									
26_Derived	15.0	15.0	2.6	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	19
26_Moderate_good	52.2	52.2	0.81	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	21
26_Thinned	40.1	40.1	0.93	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	19
46_Moderate_good	91.4	91.4	0.96	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	44
44_SVTM	100.0	100.0	0.02	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	1
46_SVTM	100.0	100.0	14.1	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	703
								Subtotal	**807**

Swainsona sericea / Silky Swainson-pea (Flora)									
23_Derived	33.2	33.2	0.01	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Not Listed	False	1
23_Moderate_good	54.3	54.3	0.04	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Not Listed	False	1
26_Derived	15.0	15.0	1.6	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Not Listed	False	12
26_Moderate_good	52.2	52.2	0.81	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Not Listed	False	21
26_Thinned	40.1	40.1	0.93	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Not Listed	False	19
46_Moderate_good	91.4	91.4	0.01	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Not Listed	False	1
28_SVTM	100.0	100.0	3.2	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Not Listed	False	162

44_SVTM	100.0	100.0	0.02	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Not Listed	False	1
46_SVTM	100.0	100.0	13.8	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Not Listed	False	688
								Subtotal	**906**

BAM Candidate Species Report

Proposal Details

Assessment Id 00041510/BAAS19078/25/00054312	Proposal Name VNI Murrumbidgee	BAM data last updated * 09/04/2026
Assessor Name Devon T Raiff	Report Created 01/06/2026	BAM Data version * Current classification (live - default) (94)
Assessor Number BAAS23009	Assessment Type Major Projects	BAM Case Status Finalised
Assessment Revision 10	BOS entry trigger	Date Finalised 18/05/2026

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

List of Species Requiring Survey

Name	Presence	Survey Months
Ardeotis australis Australian Bustard	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☑ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Austrostipa wakoolica A spear-grass	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Brachyscome muelleroides Claypan Daisy	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Brachyscome papillosa Mossgiel Daisy	Yes (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☑ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Burhinus grallarius Bush Stone-curlew	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Calotis moorei A burr-daisy	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Convolvulus tedmoorei Bindweed	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Cullen parvum Small Scurf-pea	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Eleocharis obicis Spike-Rush	Yes (surveyed) *Survey months are outside of the months specified in Bionet.	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☑ Sep ☑ Oct ☐ Nov ☐ Dec ☑ Survey month outside the specified months?

Eucalyptus leucoxylon subsp. pruinosa Yellow Gum	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Haliaeetus leucogaster White-bellied Sea-Eagle	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Hemiaspis damelii Grey Snake	No (surveyed)	☑ Jan ☑ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Hieraaetus morphnoides Little Eagle	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Lepidium monoplocoides Winged Peppercress	Yes (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☑ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Leptorhynchos orientalis Lanky Buttons	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Litoria raniformis Southern Bell Frog	Yes (surveyed)	☑ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Lophochroa leadbeateri Pink Cockatoo	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Lophoictinia isura Square-tailed Kite	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Maireana cheelii Chariot Wheels	Yes (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☑ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Myotis macropus Southern Myotis	Yes (surveyed)	☐ Jan ☑ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Ninox connivens Barking Owl	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☑ Apr ☐ May ☐ Jun ☐ Jul ☑ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Pedionomus torquatus Plains-wanderer	Yes (surveyed) *Survey months are outside of the months specified in Bionet.	☐ Jan ☑ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☑ Nov ☑ Dec ☑ Survey month outside the specified months?
Pilularia novae-hollandiae Austral Pillwort	Yes (surveyed) *Survey months are outside of the months specified in Bionet.	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☑ Sep ☑ Oct ☐ Nov ☐ Dec ☑ Survey month outside the specified months?
Polytelis swainsonii Superb Parrot	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Sclerolaena napiformis Turnip Copperburr	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Solanum karsense Menindee Nightshade	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Swainsona murrayana Slender Darling Pea	Yes (surveyed) *Survey months are outside of the months specified in Bionet.	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☑ Sep ☑ Oct ☐ Nov ☐ Dec ☑ Survey month outside the specified months?

Swainsona plagiotropis Red Darling Pea	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Swainsona sericea Silky Swainson-pea	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Tyto novaehollandiae Masked Owl	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☑ Apr ☐ May ☐ Jun ☐ Jul ☑ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Threatened species Manually Added

None added

Threatened species assessed as not on site

Refer to BAR for detailed justification

Common name	Scientific name	Justification in the BAM-C
Black-tailed Godwit	Limosa limosa	Refer to BAR
Curlew Sandpiper	Calidris ferruginea	Habitat constraints
Koala	Phascolarctos cinereus	Species is vagrant Habitat constraints
Pink-tailed Legless Lizard	Aprasia parapulchella	Refer to BAR
Pterostylis pedina	Pterostylis pedina	Refer to BAR
Regent Parrot (eastern subspecies)	Polytelis anthopeplus monarchoides	Refer to BAR
Sand-hill Spider Orchid	Caladenia arenaria	Refer to BAR
Swift Parrot	Lathamus discolor	Habitat constraints

White-browed Treecreeper population in Carrathool local government area south of the Lachlan River and Griffith local government area	Climacteris affinis - endangered population	Refer to BAR

BAM Predicted Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00041510/BAAS19078/25/00054312	VNI Murrumbidgee	09/04/2026
Assessor Name	**Report Created**	**BAM Data version ***
Devon T Raiff	01/06/2026	Current classification (live - default) (94)
Assessor Number	**Assessment Type**	**BAM Case Status**
BAAS23009	Major Projects	Finalised
Assessment Revision	**BOS entry trigger**	**Date Finalised**
10		18/05/2026

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Threatened species reliably predicted to utilise the site. No surveys are required for these species. Ecosystem credits apply to these species.

Common Name	Scientific Name	Vegetation Types(s)
Australasian Bittern	Botaurus poiciloptilus	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		24-Canegrass swamp tall grassland wetland of drainage depressions, lakes and pans of the inland plains
		160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
		53-Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluvial plains and floodplains
Australian Painted Snipe	Rostratula australis	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		24-Canegrass swamp tall grassland wetland of drainage depressions, lakes and pans of the inland plains

Australian Painted Snipe	Rostratula australis	47-Swamp grassland wetland of the Riverine Plain
		160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
		53-Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluvial plains and floodplains
Black Falcon	Falco subniger	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		23-Yarran tall open shrubland of the sandplains and plains of the semi-arid (warm) and arid climate zones
		24-Canegrass swamp tall grassland wetland of drainage depressions, lakes and pans of the inland plains
		26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion
		45-Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion
		46-Curly Windmill Grass - speargrass - wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion
		47-Swamp grassland wetland of the Riverine Plain
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		157-Bladder Saltbush shrubland on alluvial plains in the semi-arid (warm) zone including Riverina Bioregion

Black Falcon	Falco subniger	160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
		163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones
		164-Cotton Bush open shrubland of the semi-arid (warm) zone
		170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		159-Old Man Saltbush shrubland mainly of the semi-arid (warm) climate zone (south western NSW)
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		53-Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluvial plains and floodplains
Black-tailed Godwit	Limosa limosa	53-Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluvial plains and floodplains
Blue-billed Duck	Oxyura australis	17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		24-Canegrass swamp tall grassland wetland of drainage depressions, lakes and pans of the inland plains
		160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
		53-Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluvial plains and floodplains
Blue-winged Parrot	Neophema chrysostoma	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		24-Canegrass swamp tall grassland wetland of drainage depressions, lakes and pans of the inland plains
		26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion

Blue-winged Parrot	Neophema chrysostoma	28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion
		45-Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion
		46-Curly Windmill Grass - speargrass - wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		157-Bladder Saltbush shrubland on alluvial plains in the semi-arid (warm) zone including Riverina Bioregion
		160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
		163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones
		164-Cotton Bush open shrubland of the semi-arid (warm) zone
		170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		159-Old Man Saltbush shrubland mainly of the semi-arid (warm) climate zone (south western NSW)
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		53-Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluvial plains and floodplains
Brolga	Antigone rubicunda	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

Brolga	Antigone rubicunda	24-Canegrass swamp tall grassland wetland of drainage depressions, lakes and pans of the inland plains
		26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
		45-Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion
		47-Swamp grassland wetland of the Riverine Plain
		160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
		163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones
		53-Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluvial plains and floodplains
Curlew Sandpiper	Calidris ferruginea	24-Canegrass swamp tall grassland wetland of drainage depressions, lakes and pans of the inland plains
		47-Swamp grassland wetland of the Riverine Plain
		53-Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluvial plains and floodplains
Diamond Firetail	Stagonopleura guttata	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		23-Yarran tall open shrubland of the sandplains and plains of the semi-arid (warm) and arid climate zones
		26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion
		45-Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion
		46-Curly Windmill Grass - speargrass - wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion

Diamond Firetail	Stagonopleura guttata	58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
Dusky Woodswallow	Artamus cyanopterus cyanopterus	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		23-Yarran tall open shrubland of the sandplains and plains of the semi-arid (warm) and arid climate zones
		24-Canegrass swamp tall grassland wetland of drainage depressions, lakes and pans of the inland plains
		26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion
		45-Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion
		46-Curly Windmill Grass - speargrass - wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion
		47-Swamp grassland wetland of the Riverine Plain
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		157-Bladder Saltbush shrubland on alluvial plains in the semi-arid (warm) zone including Riverina Bioregion

Dusky Woodswallow	Artamus cyanopterus cyanopterus	160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
		163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones
		164-Cotton Bush open shrubland of the semi-arid (warm) zone
		170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		159-Old Man Saltbush shrubland mainly of the semi-arid (warm) climate zone (south western NSW)
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		53-Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluvial plains and floodplains
Freckled Duck	Stictonetta naevosa	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		24-Canegrass swamp tall grassland wetland of drainage depressions, lakes and pans of the inland plains
		160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
		53-Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluvial plains and floodplains
Gilbert's Whistler	Pachycephala inornata	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones

Grey Falcon	Falco hypoleucos	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		23-Yarran tall open shrubland of the sandplains and plains of the semi-arid (warm) and arid climate zones
		24-Canegrass swamp tall grassland wetland of drainage depressions, lakes and pans of the inland plains
		26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion
		45-Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion
		46-Curly Windmill Grass - speargrass - wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion
		47-Swamp grassland wetland of the Riverine Plain
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		157-Bladder Saltbush shrubland on alluvial plains in the semi-arid (warm) zone including Riverina Bioregion
		160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
		163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones

Grey Falcon	Falco hypoleucos	164-Cotton Bush open shrubland of the semi-arid (warm) zone
		170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		159-Old Man Saltbush shrubland mainly of the semi-arid (warm) climate zone (south western NSW)
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		53-Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluvial plains and floodplains
Grey-crowned Babbler (eastern subspecies)	Pomatostomus temporalis temporalis	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		23-Yarran tall open shrubland of the sandplains and plains of the semi-arid (warm) and arid climate zones
		26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
Inland Forest Bat	Vespadelus baverstocki	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

Inland Forest Bat	Vespadelus baverstocki	28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
Latham's Snipe	Gallinago hardwickii	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		23-Yarran tall open shrubland of the sandplains and plains of the semi-arid (warm) and arid climate zones
		24-Canegrass swamp tall grassland wetland of drainage depressions, lakes and pans of the inland plains
		26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion
		45-Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion
		46-Curly Windmill Grass - speargrass - wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion
		47-Swamp grassland wetland of the Riverine Plain
		157-Bladder Saltbush shrubland on alluvial plains in the semi-arid (warm) zone including Riverina Bioregion

Latham's Snipe	Gallinago hardwickii	160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
		163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones
		164-Cotton Bush open shrubland of the semi-arid (warm) zone
		159-Old Man Saltbush shrubland mainly of the semi-arid (warm) climate zone (south western NSW)
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		53-Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluvial plains and floodplains
Little Eagle	Hieraaetus morphnoides	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		23-Yarran tall open shrubland of the sandplains and plains of the semi-arid (warm) and arid climate zones
		24-Canegrass swamp tall grassland wetland of drainage depressions, lakes and pans of the inland plains
		26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion
		45-Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion

Little Eagle	Hieraaetus morphnoides	46-Curly Windmill Grass - speargrass - wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion
		47-Swamp grassland wetland of the Riverine Plain
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		157-Bladder Saltbush shrubland on alluvial plains in the semi-arid (warm) zone including Riverina Bioregion
		160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
		163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones
		164-Cotton Bush open shrubland of the semi-arid (warm) zone
		170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		159-Old Man Saltbush shrubland mainly of the semi-arid (warm) climate zone (south western NSW)
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		53-Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluvial plains and floodplains
Little Pied Bat	Chalinolobus picatus	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		23-Yarran tall open shrubland of the sandplains and plains of the semi-arid (warm) and arid climate zones
		24-Canegrass swamp tall grassland wetland of drainage depressions, lakes and pans of the inland plains

Little Pied Bat	Chalinolobus picatus	26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		157-Bladder Saltbush shrubland on alluvial plains in the semi-arid (warm) zone including Riverina Bioregion
		160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
		163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones
		164-Cotton Bush open shrubland of the semi-arid (warm) zone
		170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		159-Old Man Saltbush shrubland mainly of the semi-arid (warm) climate zone (south western NSW)
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		53-Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluvial plains and floodplains
Magpie Goose	Anseranas semipalmata	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		24-Canegrass swamp tall grassland wetland of drainage depressions, lakes and pans of the inland plains
		45-Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion
		47-Swamp grassland wetland of the Riverine Plain
		160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
		163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones
		53-Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluvial plains and floodplains

Painted Honeyeater	Grantiella picta	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		23-Yarran tall open shrubland of the sandplains and plains of the semi-arid (warm) and arid climate zones
		26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
Pied Honeyeater	Certhionyx variegatus	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		23-Yarran tall open shrubland of the sandplains and plains of the semi-arid (warm) and arid climate zones
		24-Canegrass swamp tall grassland wetland of drainage depressions, lakes and pans of the inland plains
		26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone

Pied Honeyeater	Certhionyx variegatus	58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones
		170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
Pink Cockatoo	Lophochroa leadbeateri	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		23-Yarran tall open shrubland of the sandplains and plains of the semi-arid (warm) and arid climate zones
		26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		45-Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones
		170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		159-Old Man Saltbush shrubland mainly of the semi-arid (warm) climate zone (south western NSW)
Plains-wanderer	Pedionomus torquatus	44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion
		46-Curly Windmill Grass - speargrass - wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion

Redthroat	Pyrrholaemus brunneus	17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		24-Canegrass swamp tall grassland wetland of drainage depressions, lakes and pans of the inland plains
		163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones
		159-Old Man Saltbush shrubland mainly of the semi-arid (warm) climate zone (south western NSW)
Regent Parrot (eastern subspecies)	Polytelis anthopeplus monarchoides	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Scarlet Robin	Petroica boodang	26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
South-eastern Hooded Robin	Melanodryas cucullata cucullata	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		23-Yarran tall open shrubland of the sandplains and plains of the semi-arid (warm) and arid climate zones
		26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones

Southern Whiteface	Aphelocephala leucopsis	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		23-Yarran tall open shrubland of the sandplains and plains of the semi-arid (warm) and arid climate zones
		24-Canegrass swamp tall grassland wetland of drainage depressions, lakes and pans of the inland plains
		26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion
		45-Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion
		46-Curly Windmill Grass - speargrass - wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		157-Bladder Saltbush shrubland on alluvial plains in the semi-arid (warm) zone including Riverina Bioregion
		160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
		163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones
		164-Cotton Bush open shrubland of the semi-arid (warm) zone

Southern Whiteface	Aphelocephala leucopsis	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		159-Old Man Saltbush shrubland mainly of the semi-arid (warm) climate zone (south western NSW)
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		53-Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluvial plains and floodplains
Spotted Harrier	Circus assimilis	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		23-Yarran tall open shrubland of the sandplains and plains of the semi-arid (warm) and arid climate zones
		24-Canegrass swamp tall grassland wetland of drainage depressions, lakes and pans of the inland plains
		26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion
		45-Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion
		46-Curly Windmill Grass - speargrass - wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion
		47-Swamp grassland wetland of the Riverine Plain

Spotted Harrier	Circus assimilis	58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		157-Bladder Saltbush shrubland on alluvial plains in the semi-arid (warm) zone including Riverina Bioregion
		160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
		163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones
		164-Cotton Bush open shrubland of the semi-arid (warm) zone
		170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		159-Old Man Saltbush shrubland mainly of the semi-arid (warm) climate zone (south western NSW)
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		53-Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluvial plains and floodplains
Square-tailed Kite	Lophoictinia isura	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		23-Yarran tall open shrubland of the sandplains and plains of the semi-arid (warm) and arid climate zones
		26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		45-Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion

Square-tailed Kite	Lophoictinia isura	58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
Superb Parrot	Polytelis swainsonii	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		23-Yarran tall open shrubland of the sandplains and plains of the semi-arid (warm) and arid climate zones
		26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		45-Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion
		46-Curly Windmill Grass - speargrass - wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion
Swift Parrot	Lathamus discolor	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		24-Canegrass swamp tall grassland wetland of drainage depressions, lakes and pans of the inland plains
		26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
Varied Sittella	Daphoenositta chrysoptera	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		23-Yarran tall open shrubland of the sandplains and plains of the semi-arid (warm) and arid climate zones

Varied Sittella	Daphoenositta chrysoptera	26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
Western Blue-tongued Lizard	Tiliqua occipitalis	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
White-bellied Sea-Eagle	Haliaeetus leucogaster	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		23-Yarran tall open shrubland of the sandplains and plains of the semi-arid (warm) and arid climate zones
		24-Canegrass swamp tall grassland wetland of drainage depressions, lakes and pans of the inland plains
		26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion
		45-Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion
		46-Curly Windmill Grass - speargrass - wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion

White-bellied Sea-Eagle	Haliaeetus leucogaster	47-Swamp grassland wetland of the Riverine Plain
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		157-Bladder Saltbush shrubland on alluvial plains in the semi-arid (warm) zone including Riverina Bioregion
		160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
		163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones
		164-Cotton Bush open shrubland of the semi-arid (warm) zone
		170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		159-Old Man Saltbush shrubland mainly of the semi-arid (warm) climate zone (south western NSW)
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		53-Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluvial plains and floodplains
White-fronted Chat	Epthianura albifrons	17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		24-Canegrass swamp tall grassland wetland of drainage depressions, lakes and pans of the inland plains
		44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion
		45-Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion
		46-Curly Windmill Grass - speargrass - wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion
		47-Swamp grassland wetland of the Riverine Plain
		157-Bladder Saltbush shrubland on alluvial plains in the semi-arid (warm) zone including Riverina Bioregion
		160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
		163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones

White-fronted Chat	Epthianura albifrons	164-Cotton Bush open shrubland of the semi-arid (warm) zone
		159-Old Man Saltbush shrubland mainly of the semi-arid (warm) climate zone (south western NSW)
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		53-Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluvial plains and floodplains
White-throated Needletail	Hirundapus caudacutus	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		24-Canegrass swamp tall grassland wetland of drainage depressions, lakes and pans of the inland plains
		26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
		44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion
		45-Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion
		46-Curly Windmill Grass - speargrass - wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion
		47-Swamp grassland wetland of the Riverine Plain
		157-Bladder Saltbush shrubland on alluvial plains in the semi-arid (warm) zone including Riverina Bioregion
		160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
		159-Old Man Saltbush shrubland mainly of the semi-arid (warm) climate zone (south western NSW)
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		53-Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluvial plains and floodplains

Yellow-bellied Sheathtail-bat	Saccolaimus flaviventris	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		23-Yarran tall open shrubland of the sandplains and plains of the semi-arid (warm) and arid climate zones
		24-Canegrass swamp tall grassland wetland of drainage depressions, lakes and pans of the inland plains
		26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
		28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
		45-Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains
		170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		53-Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluvial plains and floodplains

Threatened species Manually Added

None added

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Common Name	Scientific Name	Plant Community Type(s)
Regent Parrot (eastern subspecies)	Polytelis anthopeplus monarchoides	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Refer to BAR for detailed justification

Common Name	Scientific Name	Justification in the BAM-C

BAM Vegetation Zones Report

Proposal Details

Assessment Id
00041510/BAAS19078/25/00054312

Assessment name
VNI Murrumbidgee

BAM data last updated *
09/04/2026

Assessor Name
Devon T Raiff

Report Created
01/06/2026

BAM Data version *
Current classification (live - default) (94)

Assessor Number
BAAS23009

Assessment Type
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* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Vegetation Zones

#	Name	PCT	Condition	Area	Minimum number of plots	Management zones

1	13_Moderate_good	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Moderate_good	3.61	2	AreaA (1.28 ha) Area B4 (1.83 ha) Dist B10 (0.5 ha)
2	15_Derived	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Derived	6.08	3	Dist_AreaA (6.08 ha)
3	15_Moderate_good	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Moderate_good	59.93	5	Dist_AreaA (30.62 ha) Dist b4 (25.39 ha) Dist B10 (3.92 ha)
4	17_Moderate_good	17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Moderate_good	6.05	3	Area A (6.05 ha)
5	20_Derived	20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Derived	1.79	1	Area A (1.79 ha)

6	20_Thinned	20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Thinned	0.21	1	Area B4 (0.13 ha) Dist B10 (0.08 ha)
7	23_Derived	23-Yarran tall open shrubland of the sandplains and plains of the semi-arid (warm) and arid climate zones	Derived	6.47	3	Area A (6.47 ha)
8	23_Moderate_good	23-Yarran tall open shrubland of the sandplains and plains of the semi-arid (warm) and arid climate zones	Moderate_good	3.11	2	Area A (1.69 ha) Area B4 (1.42 ha)
9	24_Moderate_good	24-Canegrass swamp tall grassland wetland of drainage depressions, lakes and pans of the inland plains	Moderate_good	6.26	3	Area A (6.26 ha)
10	26_Derived	26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion	Derived	54.95	5	Area A (54.95 ha)
11	26_Native_plantings	26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion	Native_plantings	0.01	1	Area A (0.01 ha)
12	26_Moderate_good	26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion	Moderate_good	77.76	5	Area A (42.98 ha) Area B4 (34.78 ha)

13	26_Thinned	26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion	Thinned	80.95	5	Area A (45.62 ha) Area B4 (35.33 ha)
14	28_Derived	28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone	Derived	23.06	4	Area A (23.06 ha)
15	28_Derived_TS	28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone	Derived_TS	0.6	1	Area A (0.48 ha) Area B4 (0.12 ha)
16	28_Thinned	28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone	Thinned	6.77	3	Area A (3.68 ha) Area B4 (2.63 ha) Dist B10 (0.46 ha)
17	44_Moderate_good	44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion	Moderate_good	15.16	3	Area A (15.16 ha)
18	45_Moderate_good	45-Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion	Moderate_good	3.5	2	Area A (3.5 ha)
19	46_Moderate_good	46-Curly Windmill Grass - speargrass - wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion	Moderate_good	48.13	4	Area A (48.13 ha)

20	47_Moderate_good	47-Swamp grassland wetland of the Riverine Plain	Moderate_good	0.19	1	Area A (0.19 ha)
21	58_Derived	58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion	Derived	0.01	1	Area A (0.01 ha)
22	58_Thinned	58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion	Thinned	0.76	1	Area A (0.42 ha) Area B4 (0.29 ha) Dist B10 (0.05 ha)
23	157_Moderate_good	157-Bladder Saltbush shrubland on alluvial plains in the semi-arid (warm) zone including Riverina Bioregion	Moderate_good	95.08	5	Area A (95.08 ha)
24	160_Moderate_good	160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains	Moderate_good	14.36	3	Area A (14.36 ha)
25	163_Moderate_good	163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones	Moderate_good	62.46	5	Area A (62.46 ha)
26	164_Moderate_good	164-Cotton Bush open shrubland of the semi-arid (warm) zone	Moderate_good	292.99	7	Area A (292.99 ha)
27	170_Derived	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones	Derived	1.68	1	Area A (1.68 ha)
28	170_Thinned	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones	Thinned	2.32	2	Area A (1.63 ha) Area B4 (0.69 ha)

29	13_SVTM	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	SVTM	0.28	1	Dist_AreaA (0.28 ha)
30	15_SVTM	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	SVTM	1.99	1	Area A (1.99 ha)
31	28_SVTM	28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone	SVTM	3.23	2	Area A (3.23 ha)
32	44_SVTM	44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion	SVTM	0.02	1	Area A (0.02 ha)
33	157_SVTM	157-Bladder Saltbush shrubland on alluvial plains in the semi-arid (warm) zone including Riverina Bioregion	SVTM	0.11	1	Area A (0.11 ha)
34	159_SVTM	159-Old Man Saltbush shrubland mainly of the semi-arid (warm) climate zone (south western NSW)	SVTM	0.21	1	Area A (0.21 ha)
35	163_SVTM	163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones	SVTM	4.45	2	Area A (4.45 ha)

36	216_Moderate_good	216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion	Moderate_good	1.65	1	Area A (1.65 ha)
37	164_SVTM	164-Cotton Bush open shrubland of the semi-arid (warm) zone	SVTM	4.17	2	Area A (4.17 ha)
38	46_SVTM	46-Curly Windmill Grass - speargrass - wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion	SVTM	14.06	3	Area A (14.06 ha)
39	160_SVTM	160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains	SVTM	0.29	1	Area A (0.29 ha)
40	26_River_Red_Gum	26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion	River_Red_Gum	1.16	1	Dist_AreaA (0.5 ha) Dist b4 (0.45 ha) Dist B10 (0.01 ha) Dist_HTZ (0.2 ha)
41	53_Moderate_good01	53-Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluvial plains and floodplains	Moderate_good01	0.05	1	Dist_AreaA (0.05 ha)
42	13_Derived	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Derived	0.08	1	Dist_AreaA (0.08 ha)

43	159_Moderate_good	159-Old Man Saltbush shrubland mainly of the semi-arid (warm) climate zone (south western NSW)	Moderate_good	4.01	2	Dist_AreaA (4.01 ha)

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id
00041510/BAAS19078/25/00054312

Proposal Name
VNI Murrumbidgee

BAM data last updated *
09/04/2026

Assessor Name
Devon T Raiff

Assessor Number
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Proponent Names

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* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
Allocasuarina luehmannii Woodland in the Riverina and Murray-Darling Depression Bioregions	Endangered Ecological Community	20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

Species
Brachyscome muelleroides / Claypan Daisy
Calotis moorei / A burr-daisy
Convolvulus tedmoorei / Bindweed
Pedionomus torquatus / Plains-wanderer

Additional Information for Approval

PCT Outside Ibra Added

PCT
164-Cotton Bush open shrubland of the semi-arid (warm) zone

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
No Changes

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

BAM Biodiversity Credit Report (Like for like)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Not a TEC	4.0	122	5	127
15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Not a TEC	68.0	1851	160	2011
17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Not a TEC	6.1	0	224	224
20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Allocasuarina luehmannii Woodland in the Riverina and Murray-Darling Depression Bioregions	2.0	0	18	18
23-Yarran tall open shrubland of the sandplains and plains of the semi-arid (warm) and arid climate zones	Acacia melvillei Shrubland in the Riverina and Murray-Darling Depression bioregions	9.6	0	192	192
24-Canegrass swamp tall grassland wetland of drainage depressions, lakes and pans of the inland plains	Not a TEC	6.3	0	169	169
26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion	Weeping Myall Woodlands	214.8	10	3654	3664

28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone	Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions	33.7	0	465	465
44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion	Natural Grasslands of the Murray Valley Plains	15.2	0	906	906
45-Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion	Natural Grasslands of the Murray Valley Plains	3.5	0	187	187
46-Curly Windmill Grass - speargrass - wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion	Natural Grasslands of the Murray Valley Plains	62.2	0	3628	3628
47-Swamp grassland wetland of the Riverine Plain	Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains	0.2	0	10	10
58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion	Not a TEC	0.8	13	0	13
157-Bladder Saltbush shrubland on alluvial plains in the semi-arid (warm) zone including Riverina Bioregion	Not a TEC	95.2	0	3747	3747
160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains	Not a TEC	14.7	0	489	489
163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones	Not a TEC	66.9	0	2456	2456
164-Cotton Bush open shrubland of the semi-arid (warm) zone	Not a TEC	297.2	0	9707	9707

170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones	Not a TEC	4.0	37	0	37
159-Old Man Saltbush shrubland mainly of the semi-arid (warm) climate zone (south western NSW)	Not a TEC	4.2	0	228	228
216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion	Not a TEC	1.7	0	55	55
53-Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluvial plains and floodplains	Not a TEC	0.1	0	2	2

13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Inland Floodplain Woodlands This includes PCT's: 13, 15, 16, 83, 438, 454, 630	Inland Floodplain Woodlands >=50% and <70%	13_Moderate_good	Yes	122	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Inland Floodplain Woodlands This includes PCT's: 13, 15, 16, 83, 438, 454, 630	Inland Floodplain Woodlands >=50% and <70%	13_SVTM	No	5	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	Inland Floodplain Woodlands This includes PCT's: 13, 15, 16, 83, 438, 454, 630	Inland Floodplain Woodlands >=50% and <70%	13_Derived	No	0	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	**Like-for-like credit retirement options**					
	Class	Trading group	Zone	HBT	Credits	IBRA region
	Inland Floodplain Woodlands This includes PCT's: 13, 15, 16, 83, 438, 454, 630	Inland Floodplain Woodlands >=50% and <70%	15_Derived	No	73	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Inland Floodplain Woodlands This includes PCT's: 13, 15, 16, 83, 438, 454, 630	Inland Floodplain Woodlands >=50% and <70%	15_Moderate_good	Yes	1851	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Inland Floodplain Woodlands This includes PCT's: 13, 15, 16, 83, 438, 454, 630	Inland Floodplain Woodlands >=50% and <70%	15_SVTM	No	87	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

15-Black Box open woodland wetland with chenopod understorey mainly on the

17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Inland Floodplain Shrublands This includes PCT's: 17, 115, 161, 241, 247, 375	Inland Floodplain Shrublands >=50% and <70%	17_Moderate_good	No	224	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

20-Buloke - Moonah - Black Box open woodland on sandy rises of semi arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

Like-for-like credit retirement options

Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
Allocasuarina luehmannii Woodland in the Riverina and Murray-Darling Depression Bioregions This includes PCT's: 20, 22	-	20_Derived	No	15	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	Allocasuarina luehmannii Woodland in the Riverina and Murray-Darling Depression Bioregions This includes PCT's: 20, 22	-	20_Thinned	No	3	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

23-Yarran tall open shrubland of the sandplains and plains of the semi-arid (warm) and arid climate zones	**Like-for-like credit retirement options**					
	Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
	Acacia melvillei Shrubland in the Riverina and Murray-Darling Depression bioregions This includes PCT's: 23, 28, 58, 128, 170, 173	-	23_Derived	No	108	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	Acacia melvillei Shrubland in the Riverina and Murray-Darling Depression bioregions This includes PCT's: 23, 28, 58, 128, 170, 173	-	23_Moderate_good	No	84	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

24-Canegrass swamp tall grassland wetland of drainage depressions, lakes and pans of the inland plains	**Like-for-like credit retirement options**					
	Class	Trading group	Zone	HBT	Credits	IBRA region
	Inland Floodplain Shrublands This includes PCT's: 17, 24, 25, 115, 160, 161, 240, 241, 247, 261, 271, 375	Inland Floodplain Shrublands <50%	24_Moderate_good	No	169	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion

Like-for-like credit retirement options

Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
Weeping Myall Woodlands This includes PCT's: 26, 27, 1766	-	26_Derived	No	0	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Weeping Myall Woodlands This includes PCT's: 26, 27, 1766	-	26_Native_plantings	No	1	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Weeping Myall Woodlands This includes PCT's: 26, 27, 1766	-	26_Moderate_good	No	2030	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Weeping Myall Woodlands This includes PCT's: 26, 27, 1766	-	26_Thinned	No	1623	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	Weeping Myall Woodlands This includes PCT's: 26, 27, 1766	-	26_River_Red_Gum	Yes	10	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone	**Like-for-like credit retirement options**					
	Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
	Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions This includes PCT's: 19, 21, 28, 48, 75	-	28_Derived	No	242	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions This includes PCT's: 19, 21, 28, 48, 75	-	28_Derived_TS	No	12	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions This includes PCT's: 19, 21, 28, 48, 75	-	28_Thinned	No	49	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions This includes PCT's: 19, 21, 28, 48, 75	-	28_SVTM	No	162	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion	**Like-for-like credit retirement options**					
	Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
	Natural Grasslands of the Murray Valley Plains This includes PCT's: 44, 45, 46	-	44_Moderate_good	No	905	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	Natural Grasslands of the Murray Valley Plains This includes PCT's: 44, 45, 46	-	44_SVTM	No	1	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
45-Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion	**Like-for-like credit retirement options**					
	Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
	Natural Grasslands of the Murray Valley Plains This includes PCT's: 44, 45, 46	-	45_Moderate_good	No	187	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
46-Curly Windmill Grass - speargrass - wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion	**Like-for-like credit retirement options**					
	Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region

	Natural Grasslands of the Murray Valley Plains This includes PCT's: 44, 45, 46	-	46_Moderate_good	No	2749	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Natural Grasslands of the Murray Valley Plains This includes PCT's: 44, 45, 46	-	46_SVTM	No	879	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

47-Swamp grassland wetland of the Riverine Plain	**Like-for-like credit retirement options**					
	Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
	Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains This includes PCT's: 47, 360	-	47_Moderate_good	No	10	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

53-Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluvial plains and floodplains

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Inland Floodplain Swamps This includes PCT's: 47, 53, 66, 204, 205, 238, 335, 336, 360, 361, 416, 447, 465, 1291	Inland Floodplain Swamps >=50% and <70%	53_Moderate_good01	No	2	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Semi-arid Sand Plain Woodlands This includes PCT's: 58, 252	Semi-arid Sand Plain Woodlands >=50% and <70%	58_Derived	No	0	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Semi-arid Sand Plain Woodlands This includes PCT's: 58, 252	Semi-arid Sand Plain Woodlands >=50% and <70%	58_Thinned	Yes	13	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

58-Black Oak - Western Rosewood open woodland on

157-Bladder Saltbush shrubland on alluvial plains in the semi-arid (warm) zone including Riverina Bioregion

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Riverine Chenopod Shrublands This includes PCT's: 157, 158, 159, 195, 196, 211, 377	Riverine Chenopod Shrublands >=50% and <70%	157_Moderate_good	No	3742	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Riverine Chenopod Shrublands This includes PCT's: 157, 158, 159, 195, 196, 211, 377	Riverine Chenopod Shrublands >=50% and <70%	157_SVTM	No	5	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

159-Old Man Saltbush shrubland mainly of the semi-arid (warm) climate zone (south western NSW)

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Riverine Chenopod Shrublands This includes PCT's: 159, 195	Riverine Chenopod Shrublands >=90%	159_SVTM	No	13	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	Riverine Chenopod Shrublands This includes PCT's: 159, 195	Riverine Chenopod Shrublands >=90%	159_Moderate_good	No	215	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains	**Like-for-like credit retirement options**					
	Class	Trading group	Zone	HBT	Credits	IBRA region
	Inland Floodplain Shrublands This includes PCT's: 17, 24, 25, 115, 160, 161, 240, 241, 247, 261, 271, 375	Inland Floodplain Shrublands <50%	160_Moderate_good	No	478	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Inland Floodplain Shrublands This includes PCT's: 17, 24, 25, 115, 160, 161, 240, 241, 247, 261, 271, 375	Inland Floodplain Shrublands <50%	160_SVTM	No	11	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

160-Nitre Goosefoot shrubland wetland on clays of

163-Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Riverine Chenopod Shrublands This includes PCT's: 157, 158, 159, 163, 164, 168, 195, 196, 211, 212, 216, 236, 254, 377, 466	Riverine Chenopod Shrublands <50%	163_Moderate_good	No	2289	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Riverine Chenopod Shrublands This includes PCT's: 157, 158, 159, 163, 164, 168, 195, 196, 211, 212, 216, 236, 254, 377, 466	Riverine Chenopod Shrublands <50%	163_SVTM	No	167	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

164-Cotton Bush open shrubland of the semi-arid (warm) zone

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region

	Riverine Chenopod Shrublands This includes PCT's: 157, 158, 159, 163, 164, 168, 195, 196, 211, 212, 216, 236, 254, 377, 466	Riverine Chenopod Shrublands <50%	164_Moderate_good	No	9551	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Riverine Chenopod Shrublands This includes PCT's: 157, 158, 159, 163, 164, 168, 195, 196, 211, 212, 216, 236, 254, 377, 466	Riverine Chenopod Shrublands <50%	164_SVTM	No	156	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones	**Like-for-like credit retirement options**					
	Class	Trading group	Zone	HBT	Credits	IBRA region
	Sand Plain Mallee Woodlands This includes PCT's: 142, 170, 173, 174, 190, 193, 355, 474	Sand Plain Mallee Woodlands <50%	170_Derived	No	0	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	Sand Plain Mallee Woodlands This includes PCT's: 142, 170, 173, 174, 190, 193, 355, 474	Sand Plain Mallee Woodlands <50%	170_Thinned	Yes	37	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion	**Like-for-like credit retirement options**					
	Class	Trading group	Zone	HBT	Credits	IBRA region
	Riverine Chenopod Shrublands This includes PCT's: 157, 158, 159, 163, 164, 168, 195, 196, 211, 212, 216, 236, 254, 377, 466	Riverine Chenopod Shrublands <50%	216_Moderate_good	No	55	Murrumbidgee, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

Species	Vegetation Zone/s	Area / Count	Credits
Austrostipa wakoolica / A spear-grass	**17_Moderate_good, 26_Derived, 26_Moderate_good, 26_Thinned, 28_Derived, 28_Derived_TS, 28_SVTM**	21.7	379.00
Brachyscome muelleroides / Claypan Daisy	**44_SVTM, 46_SVTM**	0.5	41.00
Brachyscome papillosa / Mossgiel Daisy	**15_Derived, 15_Moderate_good, 46_Moderate_good, 157_Moderate_good, 160_Moderate_good, 163_Moderate_good, 164_Moderate_good, 13_SVTM, 15_SVTM, 44_SVTM, 157_SVTM, 159_SVTM, 163_SVTM, 164_SVTM, 46_SVTM, 160_SVTM, 13_Derived**	142.7	6447.00
Burhinus grallarius / Bush Stone-curlew	**23_Moderate_good, 13_SVTM, 15_SVTM, 28_SVTM**	3.5	168.00

Calotis moorei / A burr-daisy	**23_Derived, 23_Moderate_good, 157_Moderate_good, 157_SVTM**	1.7	112.00
Convolvulus tedmoorei / Bindweed	**17_Moderate_good, 157_Moderate_good, 44_SVTM, 157_SVTM, 159_SVTM, 160_SVTM**	14.1	953.00
Cullen parvum / Small Scurf-pea	**44_Moderate_good, 44_SVTM**	2.4	116.00
Eleocharis obicis / Spike-Rush	**17_Moderate_good, 24_Moderate_good, 157_Moderate_good, 160_Moderate_good, 163_Moderate_good, 164_Moderate_good, 13_SVTM, 157_SVTM, 159_SVTM, 163_SVTM, 164_SVTM, 160_SVTM, 13_Derived**	121.2	5339.00
Eucalyptus leucoxylon subsp. pruinosa / Yellow Gum	**13_SVTM, 15_SVTM**	2.0	4.00
Hieraaetus morphnoides / Little Eagle	**28_SVTM**	0.3	11.00

Lepidium monoplocoides / Winged Peppercress	**15_Derived, 26_Derived, 26_Moderate_good, 26_Thinned, 46_Moderate_good, 160_Moderate_good, 163_Moderate_good, 13_SVTM, 15_SVTM, 159_SVTM, 163_SVTM, 46_SVTM, 160_SVTM, 13_Derived**	47.1	2146.00
Leptorhynchos orientalis / Lanky Buttons	**26_Derived, 26_Moderate_good, 26_Thinned, 46_Moderate_good, 44_SVTM, 46_SVTM**	17.2	742.00
Litoria raniformis / Southern Bell Frog	**24_Moderate_good, 53_Moderate_good01**	0.1	4.00
Lophochroa leadbeateri / Pink Cockatoo	**28_SVTM**	0.3	14.00

Maireana cheelii / Chariot Wheels	**15_Derived, 23_Derived, 24_Moderate_good, 26_Derived, 26_Moderate_good, 26_Thinned, 44_Moderate_good, 46_Moderate_good, 157_Moderate_good, 163_Moderate_good, 164_Moderate_good, 15_SVTM, 44_SVTM, 157_SVTM, 164_SVTM, 46_SVTM, 58_Derived**	141.4	6204.00
Myotis macropus / Southern Myotis	**15_Moderate_good**	1.0	35.00
Pedionomus torquatus / Plains-wanderer	**17_Moderate_good, 26_Derived, 46_Moderate_good, 164_Moderate_good, 216_Moderate_good**	1.0	55.00
Pilularia novae-hollandiae / Austral Pillwort	**17_Moderate_good, 26_Derived, 26_Moderate_good, 26_Thinned, 44_SVTM, 46_SVTM, 13_Derived**	22.6	573.00

Sclerolaena napiformis / Turnip Copperburr	**26_Derived, 26_Moderate_good, 26_Thinned, 46_Moderate_good, 44_SVTM, 46_SVTM**	17.2	742.00
Solanum karsense / Menindee Nightshade	**15_Derived, 17_Moderate_good, 160_Moderate_good, 15_SVTM, 13_Derived**	0.9	28.00

Swainsona murrayana / Slender Darling Pea	**15_Derived, 17_Moderate_good, 23_Derived, 23_Moderate_good, 24_Moderate_good, 26_Derived, 26_Moderate_good, 26_Thinned, 28_Derived, 44_Moderate_good, 46_Moderate_good, 157_Moderate_good, 163_Moderate_good, 164_Moderate_good, 15_SVTM, 28_SVTM, 44_SVTM, 157_SVTM, 163_SVTM, 164_SVTM, 46_SVTM, 216_Moderate_good, 159_Moderate_good**	292.3	12333.00
Swainsona plagiotropis / Red Darling Pea	**26_Derived, 26_Moderate_good, 26_Thinned, 46_Moderate_good, 44_SVTM, 46_SVTM**	19.4	807.00

Swainsona sericea / Silky Swainson-pea	**23_Derived, 23_Moderate_good, 26_Derived, 26_Moderate_good, 26_Thinned, 46_Moderate_good, 28_SVTM, 44_SVTM, 46_SVTM**	20.5	906.00

Credit Retirement Options

Like-for-like credit retirement options

Austrostipa wakoolica / A spear-grass	Spp	IBRA subregion
	Austrostipa wakoolica / A spear-grass	Any in NSW
Brachyscome muelleroides / Claypan Daisy	Spp	IBRA subregion
	Brachyscome muelleroides / Claypan Daisy	Any in NSW
Brachyscome papillosa / Mossgiel Daisy	Spp	IBRA subregion
	Brachyscome papillosa / Mossgiel Daisy	Any in NSW
Burhinus grallarius / Bush Stone-curlew	Spp	IBRA subregion
	Burhinus grallarius / Bush Stone-curlew	Any in NSW

Calotis moorei / A burr-daisy	Spp	IBRA subregion
	Calotis moorei / A burr-daisy	Any in NSW
Convolvulus tedmoorei / Bindweed	Spp	IBRA subregion
	Convolvulus tedmoorei / Bindweed	Any in NSW
Cullen parvum / Small Scurf-pea	Spp	IBRA subregion
	Cullen parvum / Small Scurf-pea	Any in NSW
Eleocharis obicis / Spike-Rush	Spp	IBRA subregion
	Eleocharis obicis / Spike-Rush	Any in NSW
Eucalyptus leucoxylon subsp. pruinosa / Yellow Gum	Spp	IBRA subregion
	Eucalyptus leucoxylon subsp. pruinosa / Yellow Gum	Any in NSW
Hieraaetus morphnoides / Little Eagle	Spp	IBRA subregion
	Hieraaetus morphnoides / Little Eagle	Any in NSW
Lepidium monoplocoides / Winged Peppercress	Spp	IBRA subregion

	Lepidium monoplocoides / Winged Peppercress	Any in NSW
Leptorhynchos orientalis / Lanky Buttons	Spp	IBRA subregion
	Leptorhynchos orientalis / Lanky Buttons	Any in NSW
Litoria raniformis / Southern Bell Frog	Spp	IBRA subregion
	Litoria raniformis / Southern Bell Frog	Any in NSW
Lophochroa leadbeateri / Pink Cockatoo	Spp	IBRA subregion
	Lophochroa leadbeateri / Pink Cockatoo	Any in NSW
Maireana cheelii / Chariot Wheels	Spp	IBRA subregion
	Maireana cheelii / Chariot Wheels	Any in NSW
Myotis macropus / Southern Myotis	Spp	IBRA subregion
	Myotis macropus / Southern Myotis	Any in NSW
Pedionomus torquatus / Plains-wanderer	Spp	IBRA subregion
	Pedionomus torquatus / Plains-wanderer	Any in NSW

Pilularia novae-hollandiae / Austral Pillwort	Spp	IBRA subregion
	Pilularia novae-hollandiae / Austral Pillwort	Any in NSW
Sclerolaena napiformis / Turnip Copperburr	Spp	IBRA subregion
	Sclerolaena napiformis / Turnip Copperburr	Any in NSW
Solanum karsense / Menindee Nightshade	Spp	IBRA subregion
	Solanum karsense / Menindee Nightshade	Any in NSW
Swainsona murrayana / Slender Darling Pea	Spp	IBRA subregion
	Swainsona murrayana / Slender Darling Pea	Any in NSW
Swainsona plagiotropis / Red Darling Pea	Spp	IBRA subregion
	Swainsona plagiotropis / Red Darling Pea	Any in NSW
Swainsona sericea / Silky Swainson-pea	Spp	IBRA subregion
	Swainsona sericea / Silky Swainson-pea	Any in NSW

Appendix F

Herbarium correspondence

BOTANIC GARDENS OF SYDNEY

National Herbarium of New South Wales

Devon RAIFF
WSP Ecology
Level 3, 51-55 Bolton Street
Newcastle, NSW 2300
AUSTRALIA

BIS Enquiry No: 22597
Botanical.Is@botanicgardens.nsw.gov.au
Ph. No: (02) 4631 5135
Date: 18 March 2024

Dear Devon,
Re: 2 specimens for ID from W of Moulamein on Balranald Rd & W of Cobb Hwy nr Wangenella

Thank you for your enquiry of 11-Mar-24. We are happy to provide the following information:

Eleocharis obicis Det P Jobson 18 March 2024 (retained)

Calotis cf moorei Det. A Orme and S McCune 18 March 2024 (retained) – good match for 'Zara' collection referenced in Short's paper (1991), published in Muelleria. Your collection, along with other material sent into BIS in 2023, represents a new species, and we will shortly begin the process of recognising this taxon as a separate entity.

If you have any questions please feel free to contact me.

You have not been charged for this enquiry.

Yours sincerely,

Seanna McCune
Identification Senior Technical Officer
Botanical Identification Service

BOTANIC GARDENS OF SYDNEY

National Herbarium of New South Wales

Olivia ZADRO
WSP
Lvl 3, 51-55 Bolton St
Newcastle, NSW 2300
AUSTRALIA

BIS Enquiry No: 23226
Botanical.Is@botanicgardens.nsw.gov.au
Ph. No: (02) 4631 5135
Date: 22 January 2026

Dear Olivia,

Thank you for your Priority enquiry of 28-Oct-25, collections from Murrumbidgee NSW. We are happy to provide the following information:

27 Sep 2025 (S of Mabins Well Rd.): ***Lepidium monoplocoides*** - conf. A. Orme & F. Nge Dec 2025. Retained.

27 Sep 2025 (McLennons Bore Rd): ***Leptorhynchos squamatus* subsp. *squamatus*** - det. P. Jobson 15 Jan 2026. Retained.

An invoice for $110.00 (incl. GST) will be forwarded to you separately by our finance section to cover cost of identification.

Thank you for your enquiry.

Yours sincerely,

Catherine Wardrop
T/O Botanical Identification Service

AUSTRALIAN INSTITUTE OF BOTANICAL SCIENCE

visit NSW Flora Online at plantnet.rbgsyd.nsw.gov.au
to help you identify the plants of New South Wales

NSW GOVERNMENT Planning & Environment

BOTANIC GARDENS OF SYDNEY

National Herbarium of New South Wales

Olivia ZADRO
WSP
Lvl 3, 51-55 Bolton St
Newcastle, NSW 2300
AUSTRALIA

BIS Enquiry No: 22879
Botanical.Is@botanicgardens.nsw.gov.au
Ph. No: (02) 4631 5135
Date: 10 December 2024

Dear Olivia,

Thank you for your enquiry of 04-Dec-24, 4 specimens received for priority service. We are happy to provide the following information:

Keri Keri collections, 24/09/2024 -
1. *Lepidium monoplocoides* - det. S.F.McCune 4/12/2024. Retained.
2. *Eleocharis* sp. (Note: immature material) – det. P. Jobson 10/12/2024. Not retained.
3. Consistent with *Pilularis novae-hollandiae* (Note: sterile material, sporocarps not located) det. S.F. McCune 4/12/2024. Not retained.

Moulamein collection, 13/09/2024 -
4. *Brachyscome papillosa* - det. S.F.McCune, 4 Dec 2024. Retained.

An invoice for $110.00 (incl. GST) will be forwarded to you separately by our finance section to cover cost of identification.

Thank you for your enquiry.

Yours sincerely,

Catherine Wardrop (on behalf of -)
S. F. McCune
Identification Botanist
Botanical Identification Service

AUSTRALIAN INSTITUTE OF BOTANICAL SCIENCE

visit NSW Flora Online at plantnet.rbgsyd.nsw.gov.au
to help you identify the plants of New South Wales

NSW GOVERNMENT Planning & Environment

BOTANIC GARDENS OF SYDNEY

National Herbarium of New South Wales

Olivia ZADRO
WSP
Lvl 3, 51-55 Bolton St
Newcastle, NSW 2300
AUSTRALIA

BIS Enquiry No: 22848
Botanical.Is@botanicgardens.nsw.gov.au
Ph. No: (02) 4631 5135
Date: 24 June 2025

Dear Devon and Olivia,

Thank you for your enquiry of 14-Nov-24. We are happy to provide the following information:

Nth of Jerilderie. 12/09 - ***Pilularia novae-hollandiae*** conf. A.E. Orme 20 June 2025. Retained.

Nth of Jerilderie. 13/09 - ***Brachyscome papillosa*** conf. A.E. Orme 20 June. Retained.

Steam Plains, Conargo 13/09 - ***Swainsona murrayana*** conf. A.E. Orme 20 June 2025. Retained.

Hay Plain. PCT 164. 15/09 - ***Maireana cheelii*** conf. A.E. Orme 13 June 2025. Retained.

VN1. PCT 26. Mabins Well. 17/10 - ***Austrostipa blackii*** det. P.C. Jobson 11 June 2025 - constricted apex of lemma, long coma on lemma apex, hairy lower leaves. Retained.

Boonoke Hay Plains.19/10 - ***Leiocarpa panaetioides*** det. P.C. Jobson 11 June 2025.

Boonoke Hay Plains.19/10 - ***Leiocarpa leptolepis*** det. P.C. Jobson 11 June 2025 - sessile glands on under surface of leaves, stems and outer involucral bracts.

55H PCT 164 Wanganella. 22/10 - ***Eleocharis obicis*** conf. P.C. Jobson 11 June 2025 - leaf sheath and pith characters match.

Wanganella. 22/10 - ***Eucalyptus camaldulensis subsp. camaldulensis*** conf. A.E. Orme 13 June 2025. Retained.

H351. Wanganella. 22/10 - ***Eucalyptus camaldulensis subsp. camaldulensis*** det. A.E. Orme 13 June 2025 - not subsp. arida - stamens inflexed. Retained.

HO44. PCT 164. 23/10 - ***Eleocharis obicis*** det. P.C. Jobson 11 June 2025 - pith and sheath apex characters match.

Wanganella. 24/10 - ***Austrostipa blackii*** det. P.C. Jobson 11 June 2025 - coma on apex of lemma >2mm long. Retained.

Thank you for your enquiry.

Yours sincerely,



Catherine Wardrop
Technical Officer
Botanical Identification Service

BOTANIC GARDENS OF SYDNEY

National Herbarium of New South Wales

Devon RAIFF
WSP Ecology
Level 3, 51-55 Bolton Street
Newcastle, NSW 2300

BIS Enquiry No: 22644
Botanical.Is@botanicgardens.nsw.gov.au
Ph. No: (02) 4631 5135
Date: 21st May 2024

Dear Devon,

Re: plant identification – West of Moulamein on Yarrein Ck – 0763488mE 6112788mN

Your specimen has been confirmed as:

Eucalyptus leucoxylon* subsp. *pruinosa - conf. A.E. Orme 13th May 2024 - specimen retained for the herbarium collection - northerly extension of range.

Thank you for your sending us these quality specimens.

Yours sincerely,



Andrew Orme
Senior Identification Technical Officer
Botanical Identification Service

BOTANIC GARDENS OF SYDNEY

National Herbarium of New South Wales

Nic MCCAFFREY
WSP Australia Pty Ltd
Lvl 11,567 Collins St
Melbourne, VIC 3000

BIS Enquiry No: 23137
Botanical.Is@botanicgardens.nsw.gov.au
Ph. No: (02) 4631 5135
Date: 19 May 2026

Dear Nic,

Thank you for your enquiry of 31-Jul-25. We are happy to provide the following information:

NM383: ***Lemna trisulca*** conf. T.C. Wilson 3 Mar 2026. Retained.

NM384: ***Amphibromus fluitans*** det. P. Jobson 2 Apr 2026. Retained. NSW BCA: Vulnerable; Commonwealth EPBC: Vulnerable

NM392: ***Coronidium gunnianum*** conf. P. Jobson 2 Apr 2026. Retained.

NM393: ***Senecio campylocarpus*** conf. P. Jobson 8 Apr 2026. Retained. FFG: Endangered (EN)

NM394: ***Senecio psilocarpus*** conf. P. Jobson 9 Apr 2026. Retained. EPBC: Vulnerable (VU)

NM395: ***Senecio campylocarpus*** conf. P. Jobson 8 Apr 2026. Retained. FFG: Endangered (EN).

NM396: ***Eucalyptus*** **x** ***studleyensis*** conf. P. Jobson 2 Apr 2026. Retained. Note: buds closer to *E.ovata*

NM397: ***Eucalyptus fulgens*** conf. P. Jobson 2 Apr 2026. Retained. FFG: Endangered (EN)

NM398: ***Eucalyptus yarraensis*** conf. P. Jobson 2 Apr 2026. Retained. FFG: Critically Endangered (CR)

NM399: ***Lepidium monoplocoides*** conf. M.A.M. Renner (with Maireana cheelii) 9 Mar 2026. Retained.

NM400: ***Carex leporina*** det. K. Wilson 29 Apr 2026. Retained.

NM401: ***Senecio quadridentatus*** det P. Jobson 9 Apr 2026. Retained. - involucre length longer; cypsela longer; 'bulge' at base of receptacle missing.

There will be no fee for this service.

Yours sincerely,



Catherine Wardrop
T/O
Botanical Identification Service

Appendix G

Anabat analysis

Microbat Call Identification Report

Prepared for ("Client"):	WSP
Survey location/project name:	VNI West
Survey dates:	January – February 2024
Client project reference:	PS138962
Job no.:	WSP-2402
Report date:	23 July 2024

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Methods

Data received

Balance! Environmental received the following ultrasonic acoustic data, recorded during two summer sampling periods for the VNI West EIS project. Five sites were sampled over two separate periods (see **Table 1**).

Post-processing

Anabat Insight (Version 2.1.2; Titley Scientific, Brisbane) was used to extract individual acoustic trigger events from each Anabat Express ZCA file and store them as zero-crossing format "call sequence files". ZCA conversion settings were as follows:

- Maximum file duration = 10 s
- Recording window = 2 s
- Minimum event duration = 2 ms
- Minimum trigger frequency = 8 kHz
- Maximum trigger frequency = 500 kHz
- Smoothing = Auto

The Anabat Swift WAV files were also converted to ZC sequence file format to expedite processing and analysis.

The entire ZC file dataset was then scanned with a "noise" filter to separate files containing potentially-identifiable bat calls from those with only non-bat background noise and/or short duration calls (<4 pulses) that would be of little use for species identification. To achieve this, the following filter criteria were applied to every file using the Search tool:

- Characteristic frequency (Fc) = 10 – 165 kHz
- Pulse duration (Dur) = 2 – 120 ms
- Time between pulses (TBC) = 5 – 1500 ms

For a file to pass the filter it had to contain a minimum of four (4) bat call pulses that met all the above criteria. Files that failed the Search filter were labelled "noise" and excluded from further analysis.

Table 1 Bat detector deployment schedule: VNI West EIS; January-February 2024.

Site coordinates derived by averaging detector GPS metadata recorded each night.

Detector name	Detector serial	Latitude	Longitude	First night	Last night
Express-1	575458	-35.2785	143.8468	29/01/2024	5/02/2024
Express-2	575424	-35.2781	143.8457	30/01/2024	5/02/2024
Express-3	409353	-35.2786	143.8474	30/01/2024	5/02/2024
Swift-AB3	669203	-35.2784	143.8469	19/02/2024	22/02/2024
Swift-AB4	657470	-35.0708	143.9315	19/02/2024	22/02/2024

Call analysis

All ZC files containing identifiable bat calls were analysed in *Anabat Insight*, as follows:

1. The Decision Tree tool was used to scan all ZC files and group them according to the average metrics of the calls within. Decision Tree grouping was based primarily on characteristic frequency (Fc), with some frequency groups further subdivided using metrics such as pulse duration (Dur), slope of the characteristic section (Sc), and a custom "bandwidth" metric derived from the difference between maximum frequency (Fmax) and Fc.
2. Differentiation of the species present within each Decision Tree group was achieved by:
    a. using the Search tool in an iterative process to find signals meeting species-specific metric-based filters
        i. for each target species, the relevant files were searched on a "per pulse" basis, initially accepting only files with at least 50% of pulses, and a minimum of five pulses overall meeting the species-specific criteria.
        ii. subsequent iterations of the searches used slightly broader criteria boundaries and/or varied acceptance limits (e.g. minimum of 10 pulses without the % of pulses limit).
    b. at the conclusion of each Search iteration, at least 10% of the calls that passed the filter (i.e. likely belonged to the target species) were manually vetted before applying the relevant species label.

Call metrics used in the Search process, along with the manual vetting process, relied upon published call descriptions (Pennay *et al.* 2004) and/or were derived from regionally relevant reference calls. The likelihood of species' occurrence in the survey area was confirmed by referring to relevant distributional information (e.g., Australasian Bat Society 2021; Baker & Gynther 2023; Churchill 2008).

Where a call receives a unique species label in the above iterative process, it is implied that the identification is highly reliable (i.e. better than 90% probability that the call belongs to the relevant species). Where there is any doubt over call identities during the Search-and-vet process the files receive only an "either-or" species label (presented as "unresolved calls" in the results tables). No attempt has been made to assign differing levels of probability to call identities, so if a species is listed in its own right, the reliability rating should be treated as "Definite". Where calls only receive "either/or" labels, all members of the group should be treated as "Possibly present".

Some frequency groups inevitably include an enormous volume of calls, often with multiple individuals and species occurring in each file. For the present analysis, this was particularly the case for *Chalinolobus gouldii* and *Ozimops* spp. in the 27-33 kHz range, and *Vespadelus regulus*, *V. vulturnus* and *Chalinolobus morio* in the 48-53 kHz range. Once the iterative Search process had extracted the most reliably identifiable calls of each member species of those groups, the remaining calls in each group were ignored and attributed only to group level.

Reporting standard

The format and content of this report follows Australasian Bat Society standards for the interpretation and reporting of bat call data (Reardon 2003), available on-line at http://www.ausbats.org.au/.

Species nomenclature follows Armstrong *et al.* (2020).

Results & Discussion

The total dataset, following ZCA conversion and noise/short-call filtering included 38,557 ZC files, which contained at least 41,864 individual bat calls (numerous files included multiple call passes from two or more species).

Positive identification was achieved for 12,140 calls in 11,511 ZC files. Those calls were reliably assigned to eleven distinct species, plus the undifferentiated *Nyctophilus* genus (see **Table 2**). As many as three *Nyctophilus* spp. potentially occur in the study area , including: *N. corbeni, N. geoffroyi* and *N. gouldi*.

Many of the files used for positive species attribution also contained unresolved calls from other species that were already reliably identified. The remainder of the dataset (another 27,066 files) also contained additional calls from species that were otherwise positively identified. These unresolved and surplus calls represented at least another 29,724 individua bat call passes for the survey.

Several free-tailed bats (*Ozimops* spp.) and Gould's Wattled Bat (*Chalinolobus gouldii*) contributed over 80% (at least 35,266) of the detected calls, while another 5521 (13% of total) were attributable to Chocolate Wattled Bat (*C. morio*) and Little Forest Bat (*Vespadelus vulturnus*).

Sample spectrograms of each identified call type are presented in **Appendix 1** and an explanation of species' call identification criteria is provided in **Appendix 2**.

Table 2 Bats recorded during the VNI West surveys, January-February 2024.
Number of calls allocated per species per site.

Detector/site:	Express-1	Express-2	Express-3	Swift-AB3	Swift-AB4	Species Total
Positively identified calls						
Chalinolobus gouldii	440	19	25	755	873	2112
Chalinolobus morio	372	62	91	133	48	706
Nyctophilus sp.	12	1	1	7	18	39
Scotorepens balstoni	22	4	12	41	22	101
Scotorepens greyii	3	7	2	3	11	26
Vespadelus darlingtoni	6	1	2	5	2	16
Vespadelus regulus	81	18	25	47	63	234
Vespadelus vulturnus	104	12	33	90	137	376
Austronomus australis	3	47		3	2	55
Ozimops petersi	2010	68	400	2113	1833	6424
Ozimops planiceps	20		3	56	36	115
Ozimops ridei	433	62	226	666	549	1936
Unresolved & surplus calls						
C. gouldii / O. petersi / O. ridei	7658	3235	5100	3945	4671	24609
C. morio / V. regulus	238	95	106	94	73	606
O. petersi / O. ridei	25		2	4	10	41
O. petersi / O. planiceps	9		1	11	8	29
V. vulturnus / C. morio	2205	647	593	569	425	4439
Site Total	13641	4278	6622	8542	8781	41864

References

Armstrong, K.N., Reardon, T.B., and Jackson, S.M. (2020). A current taxonomic list of Australian Chiroptera. Australasian Bat Society. Version 2020-06-09. URL: http://ausbats.org.au/species-list/4593775065

Australasian Bat Society (2021), *BatMap.* http://ausbats.org.au/batmap. Accessed 12/2/2024.

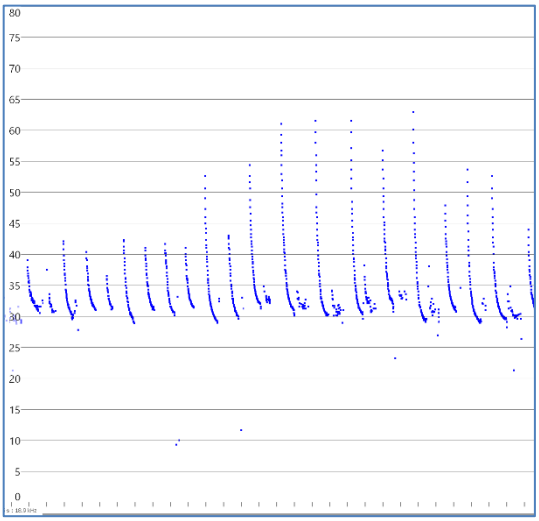
Baker, A.M. and Gynther, I.C. (editors) (2023). *Strahan's Mammals of Australia*. Fourth Edition; Reed New Holland Publishers; Sydney.

Churchill, S. (2008). *Australian Bats.* Jacana Books, Allen & Unwin; Sydney.

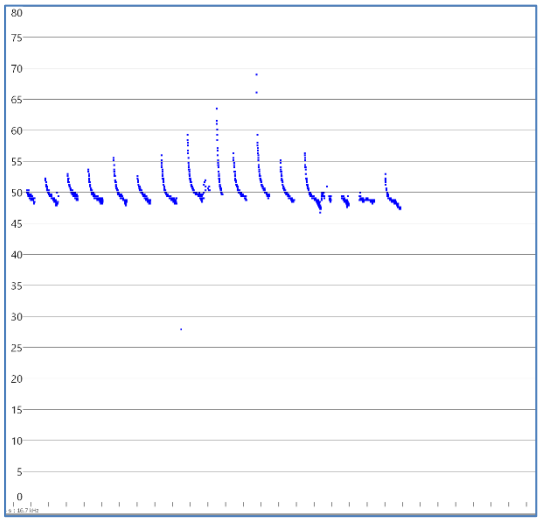
Pennay, M., Law, B. and Reinhold, L. (2004). *Bat Calls of New South Wales*. Department of Environment and Conservation, Hurstville.

Reardon, T. (2003). Standards in bat detector based surveys. *Australasian Bat Society Newsletter* **20**, 41-43.

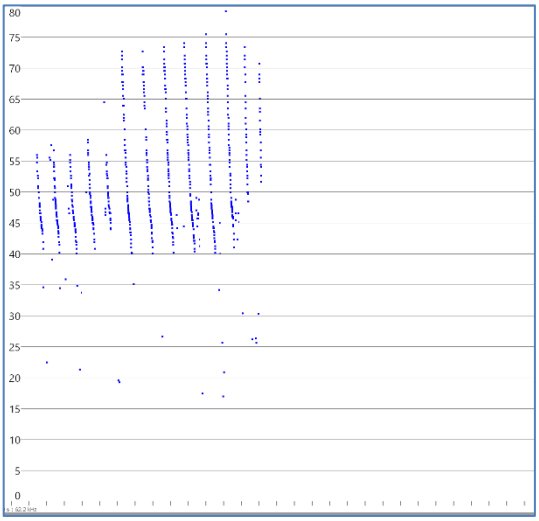
Appendix 1 Representative call sequences from the VNI West survey , Jan.-Feb. 2024 dataset.
x-axis = 10 ms per tick-mark; time between pulses removed ("compressed")



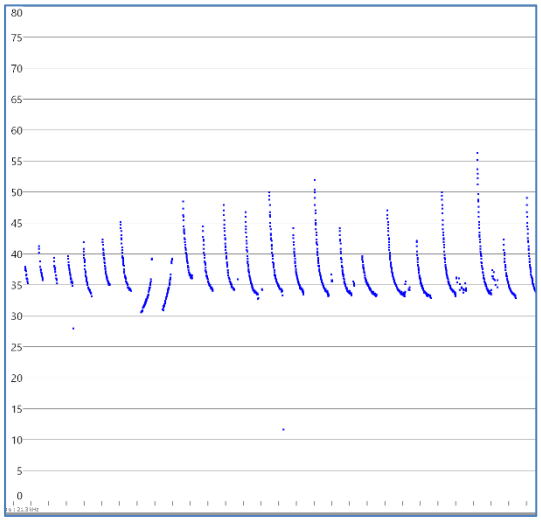
Chalinolobus gouldii



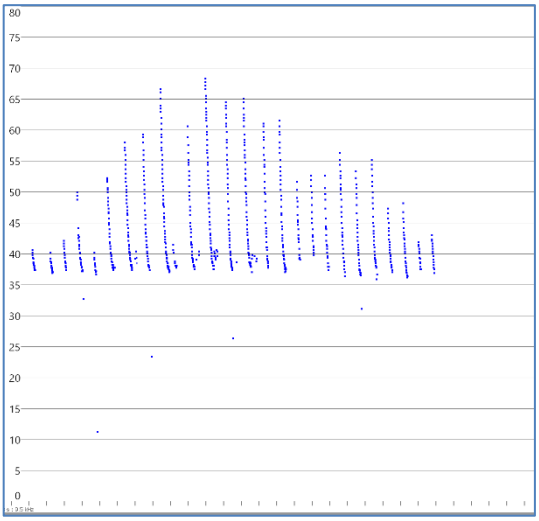
Chalinolobus morio



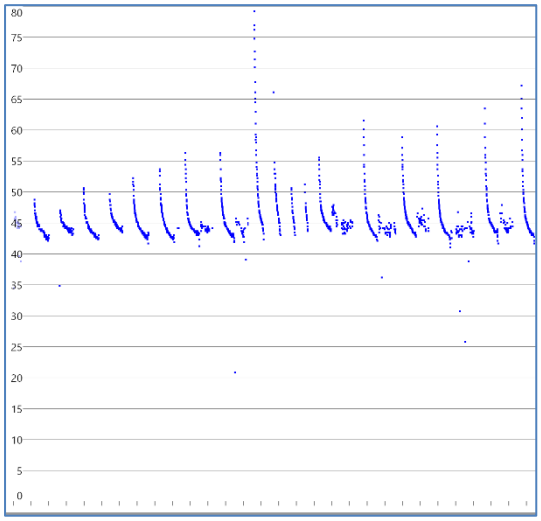
Nyctophilus sp.



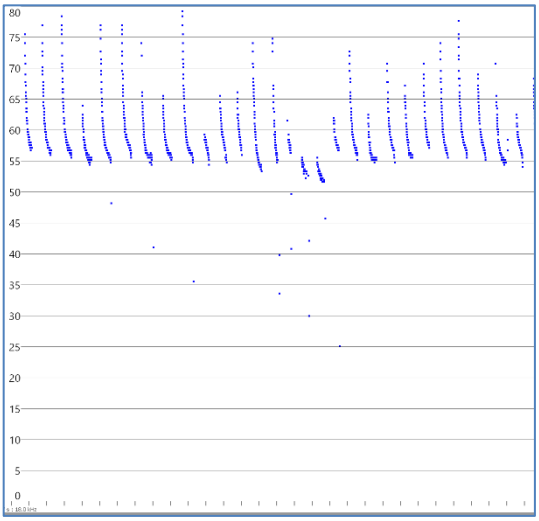
Scotorepens balstoni



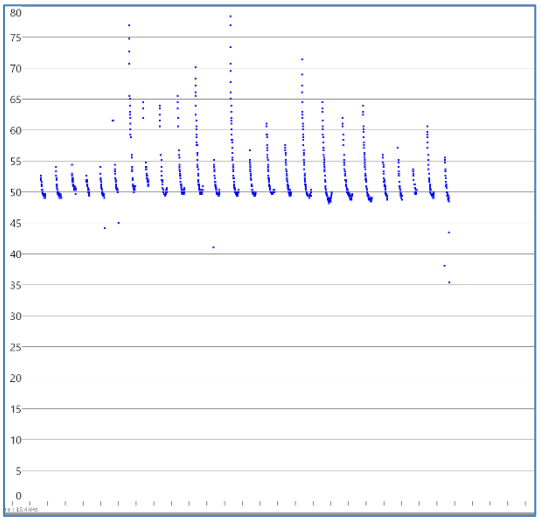
Scotorepens greyii



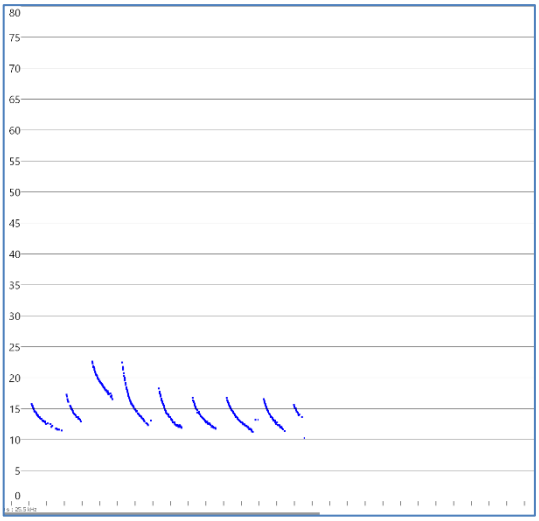
Vespadelus darlingtoni



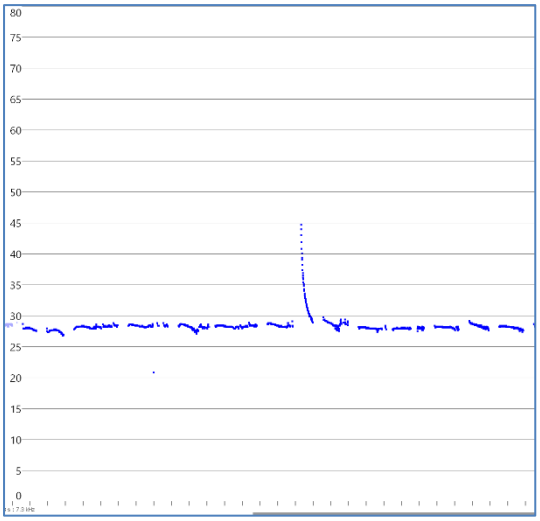
Vespadelus regulus



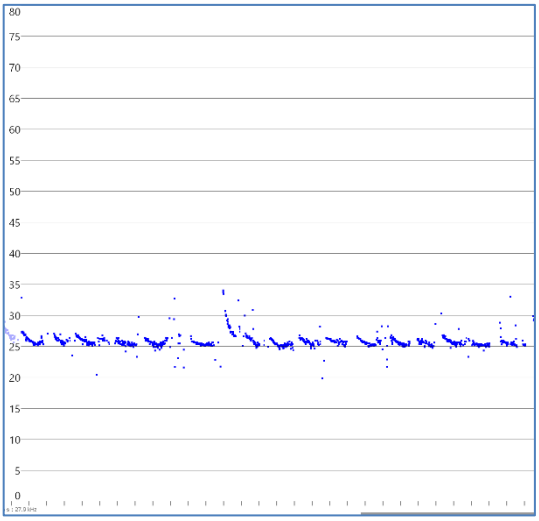
Vespadelus vulturnus



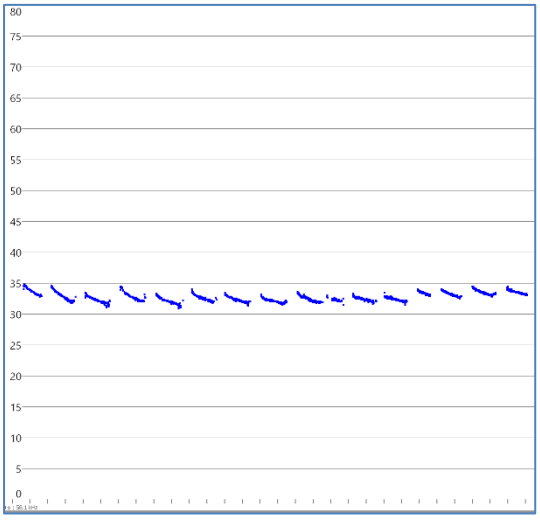
Austronomus australis



Ozimops petersi



Ozimops planiceps



Ozimops ridei

Appendix 3 Call identification notes.

Label	Species	Identification notes
AUAU	*Austronomus australis*	"Typical" *A. australis* calls with narrow-band curvilinear pulses at Fc~10-15 kHz, usually with long TBC; also includes "clutter-adapted" calls with wider bandwidth, often shorter TBC and Fc~15-20 kHz
CHGO	*Chalinolobus gouldii*	Steep initial FM, usually with quite sharp transition through knee into diagonal or near-flat body that often has down-sweeping tail or no tail, but may also be hooked with up-swept tail; clear and unambiguous alternation in Fc between successive pulses; Fc~29-33 kHz
CgOz	*C. gouldii* or *Ozimops* sp.	Very large group of unresolved calls (about 70% of the total dataset); many of the files with this label include multiple individuals producing highly variable pulse types; in some cases, both *Ozimops* and *C. gouldii* are present, in others there may be only one species but multiple individuals using a mix of open-search, clutter, and social pulses that make it difficult to reliably identify or extract positive ID using Anabat Insight metric-based filters
CHMO	*Chalinolobus morio*	Steep initial FM usually with relatively sharp knee transition to diagonal to curved or flattish body, generally with an obvious down-sweeping tail; Fc~47-51 kHz; best positive ID obtained where unambiguous Fc alternation was present, but diagonal-flattish bodies and long pulse duration (Dur>~4ms) used to distinguish from *Vespadelus* spp.
NYSP	*Nyctophilus* species	Steep, near-linear broadband FM sweep terminating around 35-45 kHz; all pulses in sequence are more-or-less parallel; no evidence of highly variable slopes in lower portion of pulses, which is usually indicative of foraging calls from *Myotis macropus*
OZPE	*Ozimops petersi*	Narrow-band (typically <2 kHz) pulses with near-flat or slight curvilinear shape at Fc~27-29 kHz; broader bandwidth pulses with similar Fc values also included and clearly not from *C. gouldii* due to longer pulse duration and absence of Fc alternation.
OZPL	*Ozimops planiceps*	Narrow bandwidth (typically <2 kHz) almost-flat to shallow curvilinear pulses with Fc~24-26 kHz; clearly distinct from higher-frequency (Fc>29 kHz) *O. ridei* and from steep, alternating *C. gouldii* calls
OZRI	*Ozimops ridei*	Narrow-band pulses with near-flat or slight curvilinear shape at Fc~31-35 kHz; broader bandwidth pulses with similar Fc values also included and clearly not from *C. gouldii* due to longer pulse duration and absence of Fc alternation.
OpeOri OplOpe	*O. petersi* or *O. ridei* *O. planiceps* or *O. petersi*	Calls with Fc values intermediate between those described above for *Ozimops* spp. were assigned to one of these pairs.
SCBA	*Scotorepens balstoni*	Steep, broad-band, curvilinear calls with the body a distinctive terminal "hook" or more-or-less flat with no tail; many calls have multiple pulses with a distinctive, sharp up-sweep (often starting lower than the final Fc value) at the beginning of each "typical" down-sweeping pulse; Fc~32-35 kHz with Fk<37 kHz
SCGR	*Scotorepens greyii*	Steep, broad-band, curvilinear calls with the body a distinctive terminal "hook" or more-or-less flat with no tail; some pulses with a distinctive, sharp up-sweep (often starting lower than the final Fc value) at the beginning of each "typical" down-sweeping pulse (but this feature not as strongly evident as in *S. balstoni*); Fc~36-39 kHz with Fk typically >38 kHz
VEDA	*Vespadelus darlingtoni*	Fc ~42-44 kHz; steep initial FM sweep of narrow-to-moderate bandwidth; pulse bodies straight-diagonal to curved, often terminating a short down-sweeping tail; some of these calls look like those of *Miniopterus orianae oceanensis*, but that species is unlikely to occur in the study area
VERE	*Vespadelus regulus*	Fc typically ~53-57 kHz; pulses often have diagonal or slightly-curved body with a distinctive down-swept tail
CmVr	*C. morio* or *V. regulus*	As above but Fc~51-53 and unclear which of these two species it is due to similar pulse shapes exhibited by the two species
VEVU	*Vespadelus vulturnus*	Fc~46-51 kHz; typically short-duration pulses (Dur<4 ms); most pulses in a sequence have distinctive "hooked" bodies; shorter sequences generally show uniform Fc; longer sequences often exhibit marked Doppler shift
VvCm	*V.s vulturnus* or *C. morio*	Calls at Fc~47-51 containing mixed or intermediate pulse shapes and with no clear alternation suggestive of *C. morio*

Detector_name	Detector_serial	Latitude	Longitude	First night	Last night
Express-1	575458	-35.2785	143.8468	29/01/2024	5/02/2024
Express-2	575424	-35.2781	143.8457	30/01/2024	5/02/2024
Express-3	409353	-35.2786	143.8474	30/01/2024	5/02/2024
Swift-AB3	669203	-35.2784	143.8469	19/02/2024	22/02/2024
Swift-AB4	657470	-35.0708	143.9315	19/02/2024	22/02/2024

Detector/site	Label	Count
Express_Unit 1_575458	AUAU	3
Express_Unit 1_575458	CHGO	440
Express_Unit 1_575458	CHMO	372
Express_Unit 1_575458	CgOz	7658
Express_Unit 1_575458	CmVr	238
Express_Unit 1_575458	NYSP	12
Express_Unit 1_575458	OZPE	2010
Express_Unit 1_575458	OZPL	20
Express_Unit 1_575458	OZRI	433
Express_Unit 1_575458	OpeOri	25
Express_Unit 1_575458	OplOpe	9
Express_Unit 1_575458	SCBA	22
Express_Unit 1_575458	SCGR	3
Express_Unit 1_575458	VEDA	6
Express_Unit 1_575458	VERE	81
Express_Unit 1_575458	VEVU	104
Express_Unit 1_575458	VvCm	2205
Express_Unit 2_575424	AUAU	47
Express_Unit 2_575424	CHGO	19
Express_Unit 2_575424	CHMO	62
Express_Unit 2_575424	CgOz	3235
Express_Unit 2_575424	CmVr	95
Express_Unit 2_575424	NYSP	1
Express_Unit 2_575424	OZPE	68
Express_Unit 2_575424	OZRI	62
Express_Unit 2_575424	SCBA	4
Express_Unit 2_575424	SCGR	7
Express_Unit 2_575424	VEDA	1
Express_Unit 2_575424	VERE	18
Express_Unit 2_575424	VEVU	12
Express_Unit 2_575424	VvCm	647
Express_Unit 3_409353	CHGO	25
Express_Unit 3_409353	CHMO	91
Express_Unit 3_409353	CgOz	5100
Express_Unit 3_409353	CmVr	106
Express_Unit 3_409353	NYSP	1
Express_Unit 3_409353	OZPE	400
Express_Unit 3_409353	OZPL	3
Express_Unit 3_409353	OZRI	226
Express_Unit 3_409353	OpeOri	2
Express_Unit 3_409353	OplOpe	1
Express_Unit 3_409353	SCBA	12
Express_Unit 3_409353	SCGR	2
Express_Unit 3_409353	VEDA	2
Express_Unit 3_409353	VERE	25
Express_Unit 3_409353	VEVU	33

Sum of Count	**Column Labels**						
Row Labels	**Express_Unit 1_575458**	**Express_Unit 2_575424**	**Express_Unit 3_409353**	**Swift_AB3_669203**	**Swift_AB4_657470**	**(blank)**	**Grand Total**
CHGO	440	19	25	755	873		2112
CHMO	372	62	91	133	48		706
NYSP	12	1	1	7	18		39
SCBA	22	4	12	41	22		101
SCGR	3	7	2	3	11		26
VEDA	6	1	2	5	2		16
VERE	81	18	25	47	63		234
VEVU	104	12	33	90	137		376
AUAU	3	47		3	2		55
OZPE	2010	68	400	2113	1833		6424
OZPL	20		3	56	36		115
OZRI	433	62	226	666	549		1936
CgOz	7658	3235	5100	3945	4671		24609
CmVr	238	95	106	94	73		606
OpeOri	25		2	4	10		41
OplOpe	9		1	11	8		29
VvCm	2205	647	593	569	425		4439
(blank)							
Grand Total	**13641**	**4278**	**6622**	**8542**	**8781**		**41864**

Express_Unit 3_409353	VvCm	593
Swift_AB3_669203	AUAU	3
Swift_AB3_669203	CHGO	755
Swift_AB3_669203	CHMO	133
Swift_AB3_669203	CgOz	3945
Swift_AB3_669203	CmVr	94
Swift_AB3_669203	NYSP	7
Swift_AB3_669203	OZPE	2113
Swift_AB3_669203	OZPL	56
Swift_AB3_669203	OZRI	666
Swift_AB3_669203	OpeOri	4
Swift_AB3_669203	OplOpe	11
Swift_AB3_669203	SCBA	41
Swift_AB3_669203	SCGR	3
Swift_AB3_669203	VEDA	5
Swift_AB3_669203	VERE	47
Swift_AB3_669203	VEVU	90
Swift_AB3_669203	VvCm	569
Swift_AB4_657470	AUAU	2
Swift_AB4_657470	CHGO	873
Swift_AB4_657470	CHMO	48
Swift_AB4_657470	CgOz	4671
Swift_AB4_657470	CmVr	73
Swift_AB4_657470	NYSP	18
Swift_AB4_657470	OZPE	1833
Swift_AB4_657470	OZPL	36
Swift_AB4_657470	OZRI	549
Swift_AB4_657470	OpeOri	10
Swift_AB4_657470	OplOpe	8
Swift_AB4_657470	SCBA	22
Swift_AB4_657470	SCGR	11
Swift_AB4_657470	VEDA	2
Swift_AB4_657470	VERE	63
Swift_AB4_657470	VEVU	137
Swift_AB4_657470	VvCm	425

Deteector/site:	Express-1	Express-2	Express-3	Swift-AB3	Swift-AB4	Species Total
Positively identified calls						
Chalinolobus gouldii	440	19	25	755	873	2112
Chalinolobus morio	372	62	91	133	48	706
Nyctophilus sp.	12	1	1	7	18	39
Scotorepens balstoni	22	4	12	41	22	101
Scotorepens greyii	3	7	2	3	11	26
Vespadelus darlingtoni	6	1	2	5	2	16
Vespadelus regulus	81	18	25	47	63	234
Vespadelus vulturnus	104	12	33	90	137	376
Austronomus australis	3	47		3	2	55
Ozimops petersi	2010	68	400	2113	1833	6424
Ozimops planiceps	20		3	56	36	115
Ozimops ridei	433	62	226	666	549	1936
Unresolved & surplus calls						
C. gouldii / O. petersi / O. ridei	7658	3235	5100	3945	4671	24609
C. morio / V. regulus	238	95	106	94	73	606
O. petersi / O. ridei	25		2	4	10	41
O. petersi / O. planiceps	9		1	11	8	29
V. vulturnus / C. morio	2205	647	593	569	425	4439
Site Total	13641	4278	6622	8542	8781	41864

Targeted species*	Common name	Recorded (Y/N)	Credit type.
Nyctophilus corbeni	Corben's Long-eared Bat	No, however a Nyctophilus sp. was recorded	Predicted
Vespadelus baverstocki	Inland Forest Bat	N	Predicted
Miniopterus orianae oceanensis	Large Bent-winged Bat	N	Dual
Chalinolobus dwyeri	Large-eared Pied Bat	N	Candidate
Chalinolobus pictus	Little Pied Bat	N	Predicted
Myotis macropus	Southern Myotis	N	Candidate
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	N	Predicted

**Species listed acquired from the PBA Appendix B.*

Microbat Call Identification Report

Prepared for ("Client"):	WSP
Survey location/project name:	VNI Project, Moulamein area, NSW
Survey dates:	17-20 Feb. & 20-24 Oct. 2025
Client project reference:	PS138962
Job no.:	WSP-2601
Report date:	20 February 2026

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Methods

Data received

Balance! Environmental received six SD cards containing data recorded by 3 x Song Meter Mini Bat and 3 x Anabat Express detectors; however, two cards (Song Meter 2MU02967 and Anabat SN409353) contained no echolocation call recordings. The other four units each sample d a single site for 4 or 5 consecutive nights (see **Table 1**).

Call analysis

Analyses were performed in several steps with *Anabat Insight* (v2.1.7; Titley Scientific, Brisbane).

1. The convert ZCA tool was used to extract individual acoustic triggers from the Express ZCA files and save them as zero-crossing sequence files. A noise filter was applied during the ZC conversion process to exclude files that contained no identifiable bat calls.
2. The same noise filter was applied to the Song Meter dataset.
3. All files from the four units that passed the noise filter (i.e. contained bat calls) were processed with the Decision Tree tool and group files according to the average call metrics in each file. Decision Tree grouping was based primarily on characteristic frequency (Fc), with some frequency groups further subdivided using metrics such as pulse duration (Dur), slope of the characteristic section (Sc), and a custom "bandwidth" metric derived from the difference between maximum frequency (Fmax) and Fc.
4. Differentiation of the species present within each Decision Tree group was achieved by:
    a. using the Search tool in an iterative process to find signals meeting species-specific metric-based filters
        i. for each target species, the relevant files were searched on a "per pulse" basis, initially accepting only files with at least 50% of pulses, and a minimum of five pulses overall meeting the species-specific criteria.
        ii. subsequent iterations of the searches used slightly broader criteria boundaries and/or varied acceptance limits (e.g. minimum of 10 pulses without the % of pulses limit).
    b. at the conclusion of each Search iteration, at least 10% of the calls that passed the filter (i.e. likely belonged to the target species) were manually vetted before applying the relevant species label.

Call metrics used in the Search process, along with the manual vetting process, relied upon published call descriptions (Pennay *et al.* 2004) and/or were derived from regionally relevant reference calls. The likelihood of species' occurrence in the survey area was confirmed by referring to relevant distributional information (e.g., Australasian Bat Society 2021; Baker & Gynther 2023; Churchill 2008).

Calls were either positively identified and assigned to a distinct taxon or were attributed to a multi-species complex because the call parameters were in the overlap zone of two or more species.

Some frequency groups included an enormous volume of calls, often with multiple individuals and species occurring in each file. For the present analysis, this was particularly the case for *Chalinolobus gouldii* and *Ozimops* spp. in the 27-33 kHz range, and *Vespadelus regulus*, *V. vulturnus* and *Chalinolobus morio* in the 48-53 kHz range. Once the iterative Search process had extracted the most reliably identifiable calls of each member species of those groups, the remaining calls in each group were ignored and attributed only to species complexes.

Reporting standard

The format and content of this report follows Australasian Bat Society standards for the interpretation and reporting of bat call data (Reardon 2003), available on-line at http://www.ausbats.org.au/.

Species nomenclature follows Armstrong *et al.* (2020).

Table 1 Bat detector deployment details for the VNI surveys, February and October 2025.

Detector	Latitude	Longitude	First night	Last night	Total ZC files	ZC files with calls	ZC files noise
2MU02970	-35.0452	143.9062	17/02/2025	20/02/2025	2475	1381	1094
2MU03044	-35.0401	143.90641	17/02/2025	20/02/2025	2173	1820	353
SN575424	-35.3568	143.8692	20/10/2025	24/10/2025	3321	1488	1833
SN575458	-35.0511	143.8897	20/10/2025	24/10/2025	13411	11487	1924

Results & Discussion

After ZCA conversion, the entire dataset across the four detectors contained 21380 ZC sequence files; however, 5204 of those files were excluded from further analysis by the noise filter. Identification of all species in the dataset was achieved using 1557 of the call sequence files, with the remaining files containing surplus examples of several highly active species (*C. gouldii, C. morio, Ozimops* spp., *Vespadelus* spp.). A high proportion of those surplus files contained more than three call passes of two or more different species. This reflects the placement of detectors beside water, which attracts very high bat activity.

At least eleven species were recorded, with the positively identified calls attributed to ten distinct species plus the undifferentiated *Nyctophilus* genus (see **Table 2**). Up to three *Nyctophilus* species – *N. corbeni, N. geoffroyi, N. gouldi* – potentially occur in the study area.

All “unresolved” calls belonged to species that were positively identified from other calls.

Sample spectrograms of each identified call type are presented in **Appendix 1** and an explanation of species’ call identification criteria is provided in **Appendix 2**.

Table 2 Bats recorded during VNI surveys, February and October 2025.
Number of calls attributed per species per site.

Detector:	2MU02970	2MU03044	SN575424	SN575458	Species Total
Positively identified calls					
Chalinolobus gouldii	24	38	14	140	216
Chalinolobus morio	49	15	12	87	163
Myotis macropus	3	3	1	34	41
Nyctophilus sp.	1	12		4	17
Scotorepens balstoni	3	4	4	1	12
Vespadelus regulus	3		29	90	122
Vespadelus vulturnus	24	27	6	6	63
Austronomus australis	3	2	9		14
Ozimops petersi	19	19	2	17	57
Ozimops planiceps	190	162	5	14	371
Ozimops ridei	5	17	5	64	91
Unresolved calls					0
C. gouldii or *Ozimops* sp.	18	42	45	386	491
C. gouldii or *S. balstoni*	1	2	1		4
C. morio or *V. regulus*	37	2	12	15	66
Nyctophilus sp. or *M. macropus*	1	5		2	8
Ozimops sp.	3	3	1	2	9
V. vulturnus or *C. morio*	43	109	35	330	517
Site Total	427	462	181	1192	2262

References

Armstrong, K.N., Reardon, T.B., and Jackson, S.M. (2020). A current taxonomic list of Australian Chiroptera. Australasian Bat Society. Version 2020-06-09.
URL: http://ausbats.org.au/species-list/4593775065

Australasian Bat Society (2021), *BatMap.* http://ausbats.org.au/batmap. Accessed 12/2/2024.

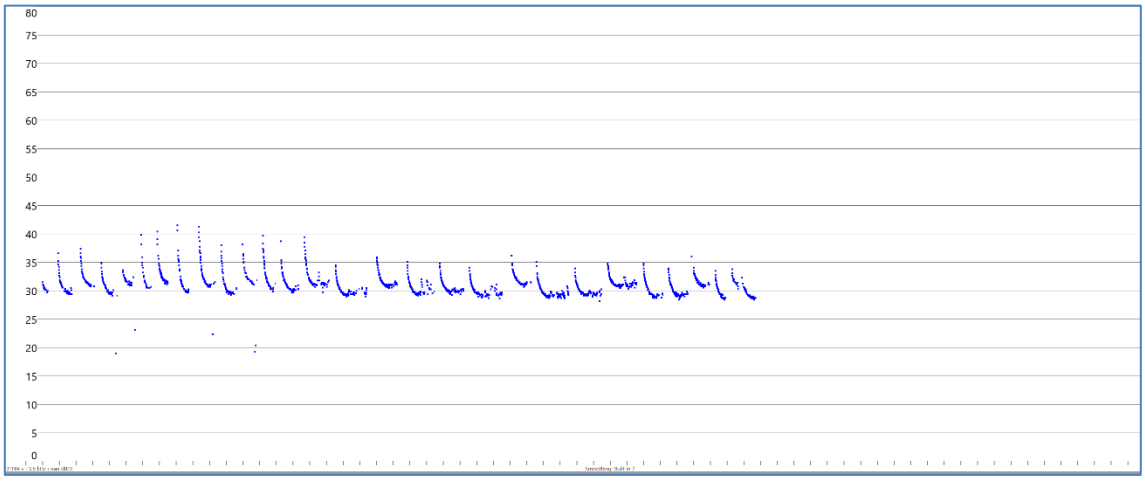
Baker, A.M. and Gynther, I.C. (editors) (2023). *Strahan's Mammals of Australia*. Fourth Edition; Reed New Holland Publishers; Sydney.

Churchill, S. (2008). *Australian Bats.* Jacana Books, Allen & Unwin; Sydney.

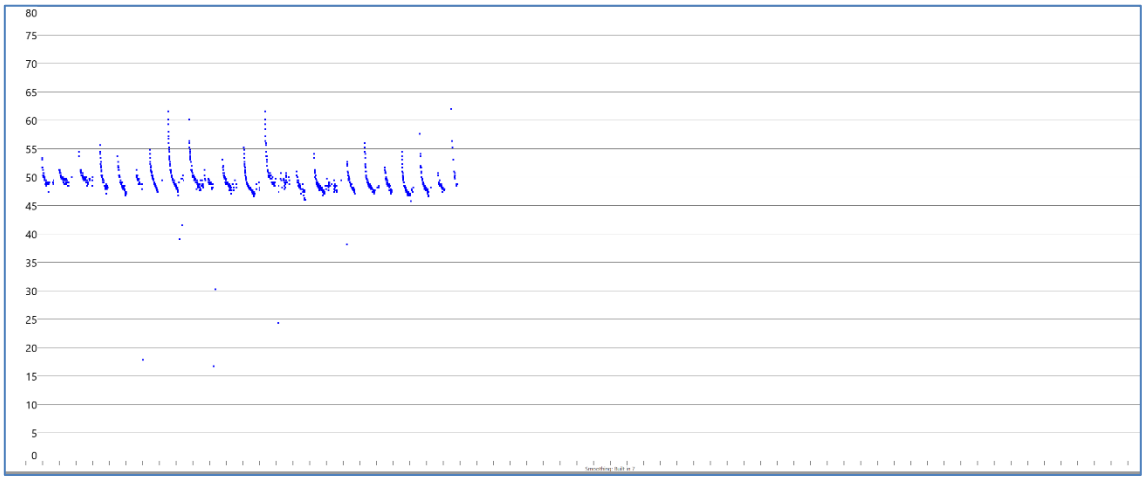
Pennay, M., Law, B. and Reinhold, L. (2004). *Bat Calls of New South Wales*. Department of Environment and Conservation, Hurstville.

Reardon, T. (2003). Standards in bat detector based surveys. *Australasian Bat Society Newsletter* **20**, 41-43.

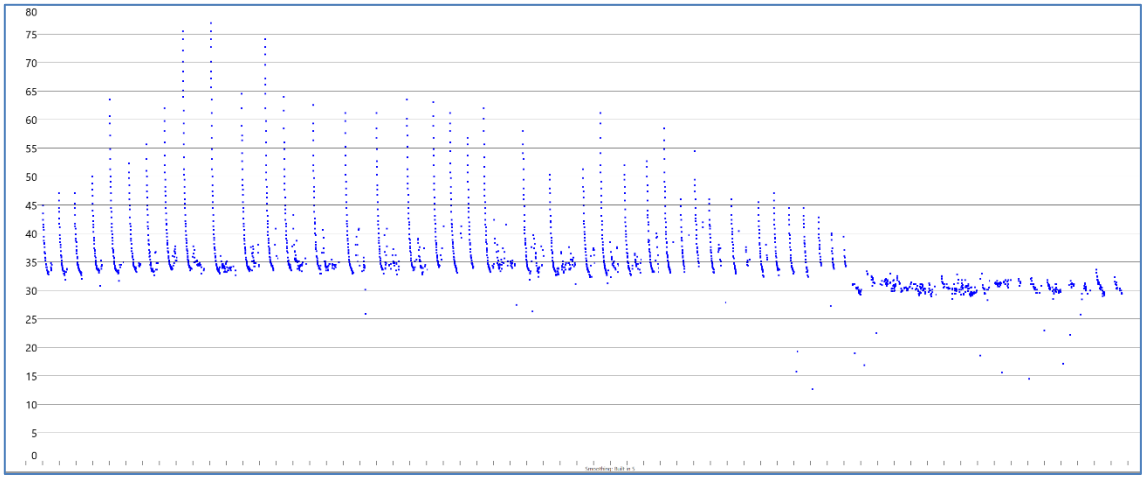
Appendix 1 Representative call sequences from the VNI dataset.
x-axis = 10 ms per tick-mark; time between pulses removed ("compressed")



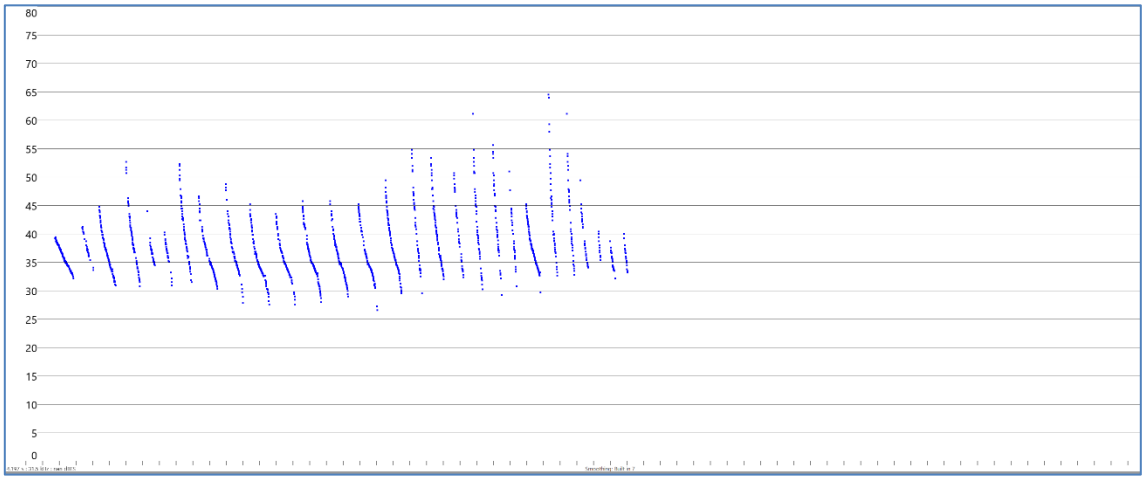
Chalinolobus gouldii



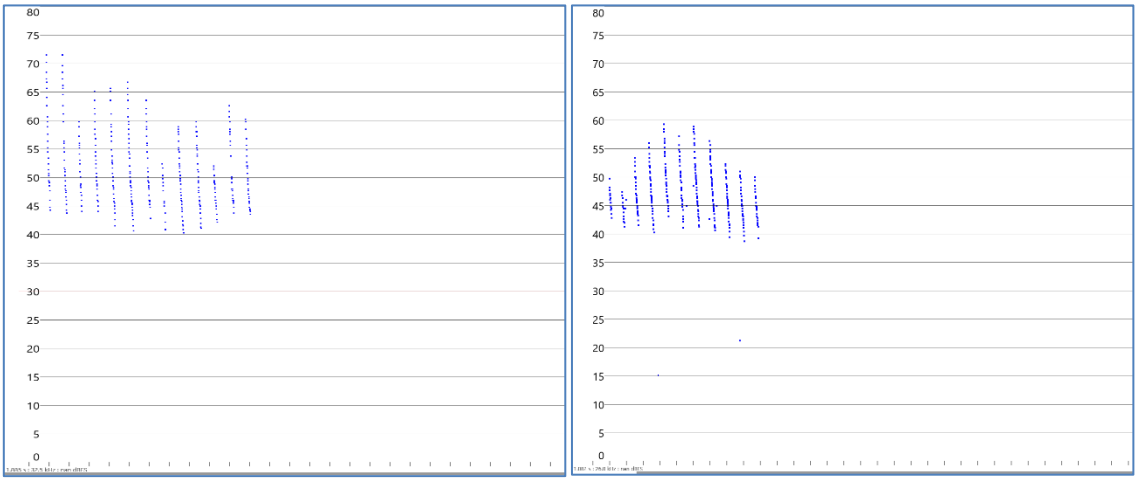
Chalinolobus morio



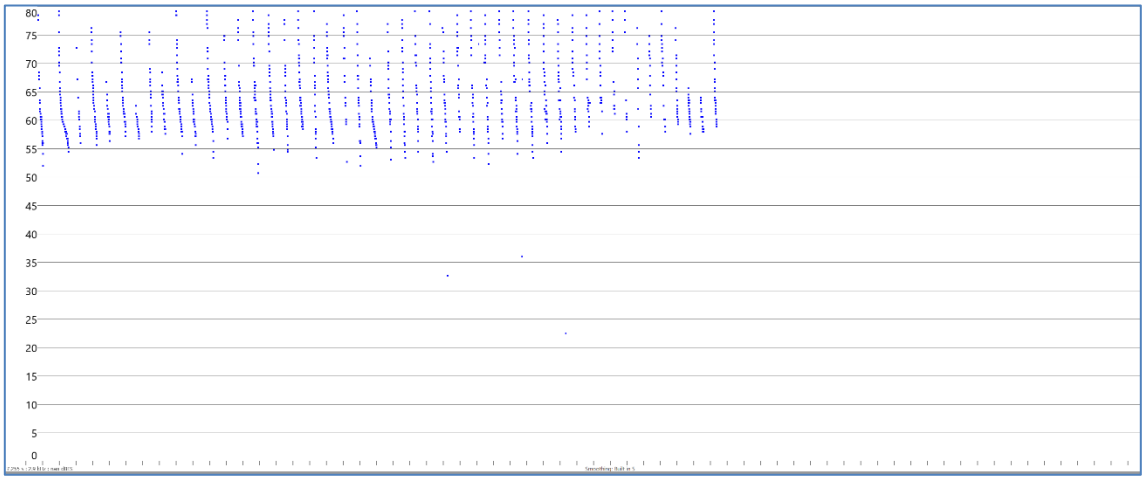
Scotorepens balstoni



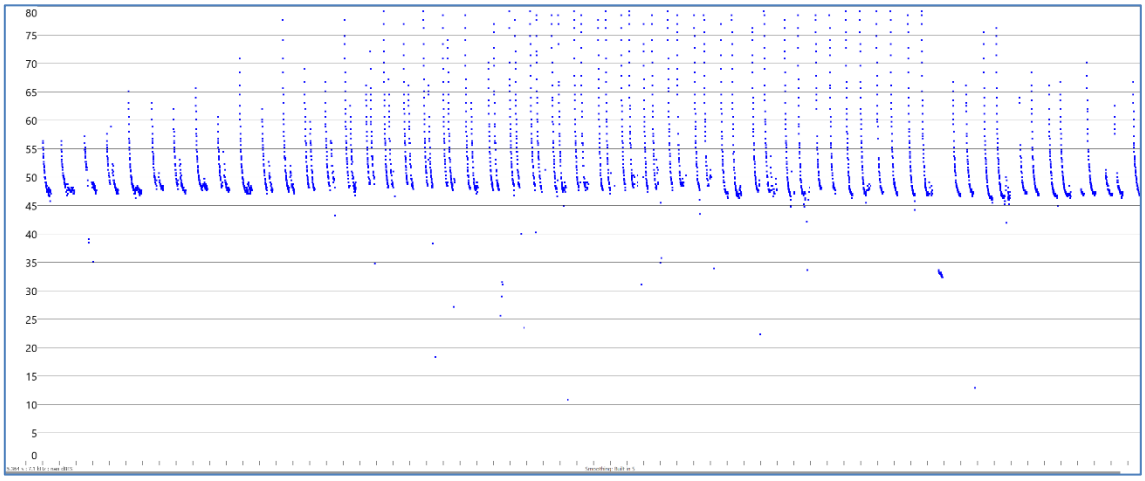
Myotis macropus



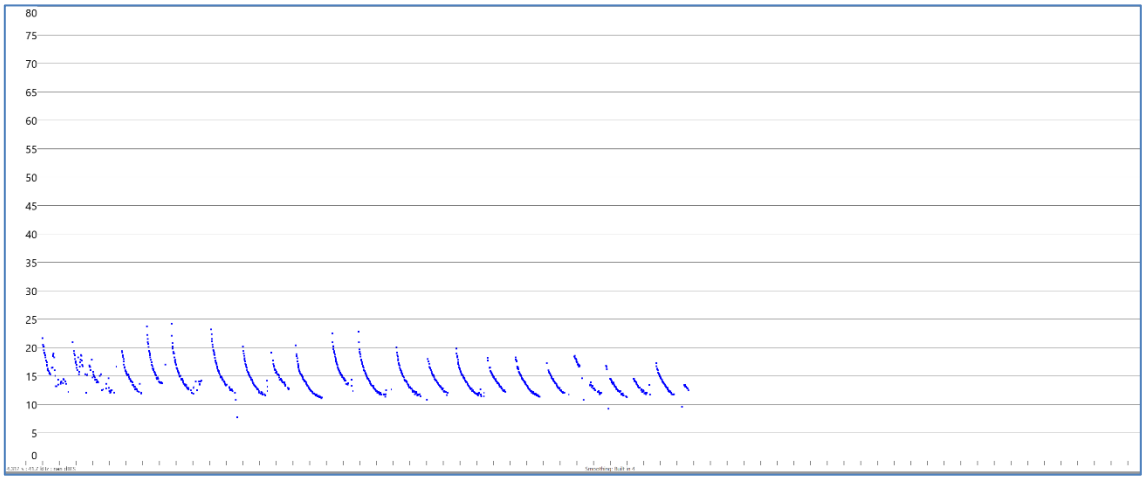
Nyctophilus sp.



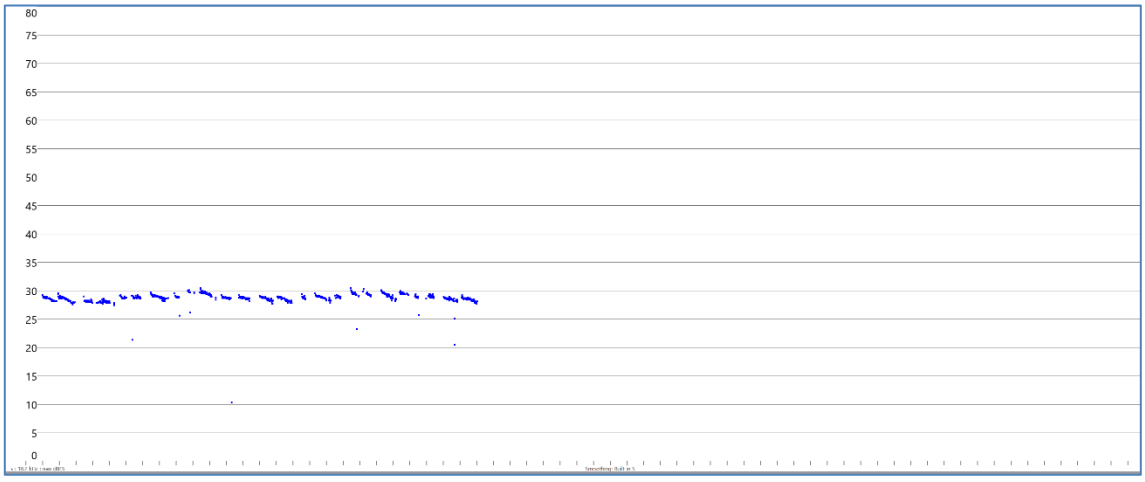
Vespadelus regulus



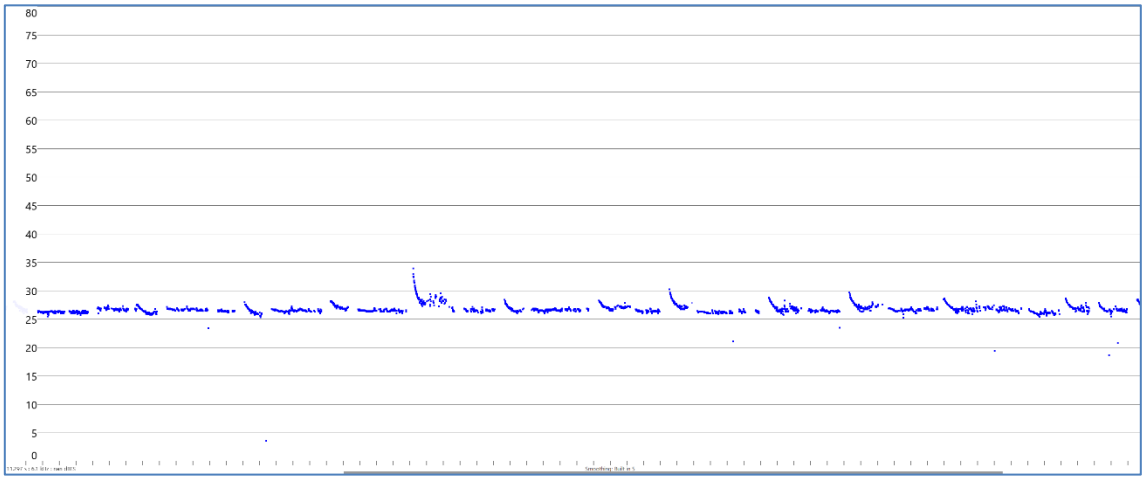
Vespadelus vulturnus



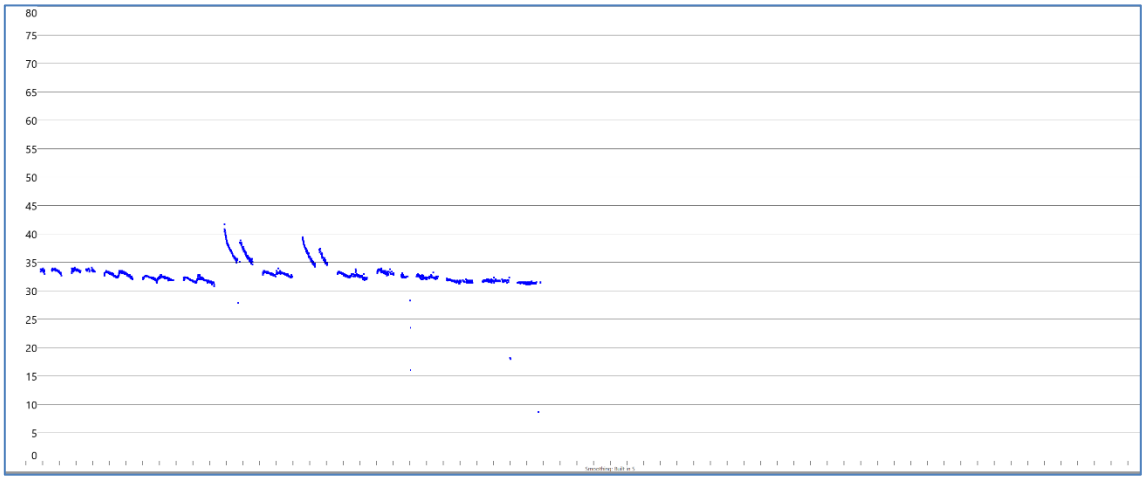
Austronomus australis



Ozimops petersi



Ozimops planiceps



Ozimops ridei

Appendix 3 Call identification notes.

Label	Species	Identification notes
AUAU	*Austronomus australis*	"Typical" *A. australis* calls with narrow-band curvilinear pulses at Fc~10-15 kHz, usually with long TBC; also includes "clutter-adapted" calls with wider bandwidth, often shorter TBC and Fc~15-20 kHz
CHGO	*Chalinolobus gouldii*	Steep initial FM, usually with quite sharp transition through knee into diagonal or near-flat body that often has downsweeping tail or no tail, but may also be hooked with up-swept tail; clear and unambiguous alternation in Fc between successive pulses; Fc~29-33 kHz
CgSb	*C. gouldii* or *Scotorepens balstoni*	Calls with steep initial FM and curved body with no tail or slight up-sweep ("hook"); Fc~31-34 kHz, with no clear evidence of alternation (ie not obvious *C. gouldii*); typically these are weak or short calls that simply did not have enough evidence for positive ID
CHMO	*Chalinolobus morio*	Steep initial FM usually with relatively sharp knee transition to diagonal to curved or flattish body, generally with an obvious down-sweeping tail; Fc~46-51 kHz; best positive obtained where Fc alternation was present, but diagonal-flattish bodies and long pulse duration (Dur>~4ms) distinguish from *Vespadelus* spp.
CmVr	*C. morio* or *Vespadelus regulus*	As above but Fc~51-53 and unclear which of these two species it is (see also description for *V. regulus*, below)
MYMA	*Myotis macropus*	Steep FM call pulses terminating between 30 and 40 kHz; distinct kink in the middle third of the pulse and lower portion of each pulse often varying substantially between pulses in a sequence
NYSP	*Nyctophilus* species	Steep, near-linear broadband FM sweep terminating around 40-45 kHz; all pulses in sequence are more-or-less parallel; no evidence of highly variable slopes in lower portion of pulses, which is usually indicative of foraging calls from *Myotis macropus*
OZPE	*Ozimops petersi*	Narrow bandwidth (typically <2 kHz) pulses with near-flat or slight curvilinear shape at Fc~27-28 kHz;
OZPL	*Ozimops planiceps*	Narrow bandwidth (typically <2 kHz) almost-flat to shallow curvilinear pulses with Fc~24-26 kHz; clearly distinct from higher-frequency (Fc>27 kHz) *O. petersi* and *O. ridei* and from steep, alternating *C. gouldii* calls
OZRI	*Ozimops ridei*	Narrow bandwidth (typically <2 kHz) pulses with near-flat or slight curvilinear shape at Fc~30-31 kHz
OplOpe and OpeOri	*O. petersi/O. planiceps* and *O. ridei/O. petersi*	Obvious *Ozimops* calls with Fc values intermediate between those described above and/or with variable pulse shapes and/or multiple individuals recorded simultaneously
CgOz	*Ozimops* sp. or *C. gouldii*	Very large group of unresolved calls; many of the files with this label include multiple individuals producing highly variable pulse types; in some cases, both *Ozimops* and *C. gouldii* are present, in others there may be only one species but multiple individuals using a mix of open-search, clutter, and social pulses that make it difficult to reliably identify
SCBA	*Scotorepens balstoni*	Steep, broad-band, curvilinear calls with the body a distinctive terminal "hook" or more-or-less flat with no tail; many calls have multiple pulses with a distinctive, sharp up-sweep (often starting lower than the final Fc value) at the beginning of each "typical" downsweeping pulse; Fc~32-35 kHz with Fk<37 kHz
VERE	*Vespadelus regulus*	Fc typically >53 kHz; pulses often with diagonal or slightly-curved body with a distinctive down-swept tail; some calls at Fc~51-52 possibly missed/incorrectly allocated to *C. morio*, due to pulse-shape similarities, but these were generally given the combined species label (see above)
VEVU	*Vespadelus vulturnus*	Fc~46-49 kHz; typically short-duration pulses (Dur<4 ms); most pulses in a sequence have distinctive "hooked" bodies; shorter sequences generally show uniform Fc; longer sequences often exhibit marked Doppler shift
VvCm	*Vespadelus vulturnus* or *Chalinolobus morio*	Calls at Fc~46-49 kHz containing mixed or intermediate pulse shapes and with no clear alternation suggestive of *C. morio*

Detector:	BC Act	SAII	EPBC Act	2MU02970	2MU03044	SN575424	SN575458	Species Total
Positively identified calls								
Chalinolobus gouldii	-	-	-	24	38	14	140	216
Chalinolobus morio	-	-	-	49	15	12	87	163
Myotis macropus	V	-	-	3	3	1	34	41
Nyctophilus sp.	V	-	V	1	12		4	17
Scotorepens balstoni	-	-	-	3	4	4	1	12
Vespadelus regulus	-	-	-	3		29	90	122
Vespadelus vulturnus	-	-	-	24	27	6	6	63
Austronomus australis	-	-	-	3	2	9		14
Ozimops petersi	-	-	-	19	19	2	17	57
Ozimops planiceps	-	-	-	190	162	5	14	371
Ozimops ridei	-	-	-	5	17	5	64	91
Unresovled calls	-	-	-					0
C. gouldii or Ozimops sp.	-	-	-	18	42	45	386	491
C. gouldii or S. balstoni	-	-	-	1	2	1		4
C. morio or V. regulus	-	-	-	37	2	12	15	66
Nyctophilus sp. or M. macropus				1	5		2	8
Ozimops sp.	-	-	-	3	3	1	2	9
V. vulturnus or C. morio	-	-	-	43	109	35	330	517
Site Total				427	462	181	1192	2262

Appendix H

Recorded fauna species

H1 Recorded fauna species

Table H.1 Recorded fauna species

Scientific name	Common name	Native species		SAII
		BC status	EPBC status	
Mammals				
Antechinus agilis	Agile Antechinus			
Antechinus flavipes	Yellow-footed Antechinus			
Austronomus australis	White-striped Freetail Bat			
**Camelus dromedarius*	Camel			
Chalinolobos gouldii	Gould's Wattled Bat			
Chalinolobus morio	Chocolate Wattled Bat			
**Felis catus*	Feral Cat			
Hydromys chrysogaster	Water-rat			
**Lepus europaeus*	European Hare			
Macropus fuliginosus	Western Grey Kangaroo			
Macropus giganteus	Eastern Grey Kangaroo			
**Mus musculus*	House Mouse			
Nyctophilus geoffroyi	Lesser Long-Eared Bat			
Nyctophilus gouldii	Gould's Long-Eared Bat			
**Oryctolagus cuniculus*	European Rabbit			
Osphranter rufus	Red Kangaroo			
Ozimops petersi	Inland Free-Tailed Bat			
Ozimops planiceps	South-Eastern Free-Tailed Bat			
Ozimops ridei	Eastern Free-Tailed Bat			
Petaurus notatus	Krefft's Glider			
**Rusa unicolor*	Sambar Deer			
Scotorepens balstoni	Inland Broad-Nosed Bat			
Scotorepens greyii	Little Broad-Nosed Bat			
**Sus scrofa*	Feral Pig			
Trichosurus vulpecula	Common Brushtail Possum			
Vespadelus bravestocki	Inland Forest Bat			
Vespadelus darlingtoni	Large Forest Bat			
Vespadelus regulus	Southern Forest Bat			

Scientific name	Common name	Native species		SAII
		BC status	EPBC status	
Vespadelus vulturnus	Little Forest Bat			
**Vulpes vulpes*	Fox			
Birds				
Acanthiza apicalis	Inland Thornbill			
Acanthiza chrysorrhoa	Yellow-rumped Thornbill			
Acanthiza nana	Yellow Thornbill			
Acanthiza reguloides	Buff-rumped Thornbill			
Acanthiza uropygialis	Chestnut-rumped Thornbill			
**Acridotheres tristis*	Common Mynah			
Acrocephalus australis	Australian Reed-Warbler			
Aegotheles cristatus	Australian Owlet-nightjar			
Anas gracilis	Grey Teal			
Anas superciliosa	Pacific Black Duck			
Anhinga novaehollandiae	Australasian Darter			
Anthus novaeseelandiae	Australasian Pipit			
Aphelocephala leucopsis	Southern Whiteface	V	V	N
Aquila audax	Wedge-tailed Eagle			
Ardea alba	Great Egret			
Ardea pacifica	White-necked Heron			
Artamus cinereus	Black-faced Woodswallow			
Barnardius zonarius	Australian Ringneck			
Barnardius zonarius barnardi	Mallee Ringneck			
Burhinus grallarius	Bush Stone-curlew	E	–	N
Cacatua galerita	Sulphur-crested Cockatoo			
Cacatua sanguinea	Little Corella			
Chalcites basalis	Horsfield's Bronze-cuckoo			
Chenonetta jubata	Australian Wood Duck			
Cincloramphus cruralis	Brown Songlark			
Cincloramphus mathewsi	Rufous Songlark			
Circus assimilis	Spotted Harrier	V	–	N
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	V	V	N
Colluricincla harmonica	Grey Shrike-thrush			
Coracina novaehollandiae	Black-faced Cuckoo-shrike			

Scientific name	Common name	Native species		SAII
		BC status	EPBC status	
Corcorax melanorhamphos	White-winged Chough			
Corvus coronoides	Australian Raven			
Cracticus nigrogularis	Pied Butcherbird			
Cracticus torquatus	Grey Butcherbird			
Cygnus atratus	Black Swan			
Dacelo novaeguineae	Laughing Kookaburra			
Daphoenositta chrysoptera	Varied Sittella			
Dicaeum hirundinaceum	Mistletoebird			
Dromaius novaehollandiae	Emu			
Egretta novaehollandiae	White-faced Heron			
Elanus axillaris	Black-shouldered Kite			
Elseyornis melanopsb	Black-fronted Dotterel			
Entomyzon cyanotis	Blue-faced Honeyeater			
Eolophus roseicapilla	Galah			
Epthianura albifrons	White-fronted Chat	V	–	N
Falco berigora	Brown Falcon			
Falco cenchroides	Nankeen Kestrel			
Falco longipennis	Australian Hobby			
Falco subniger	Black Falcon	V	–	N
Gavicalis virescens	Singing Honeyeater			
Geopelia placida	Peaceful Dove			
Gerygone fusca	Western Gerygone			
Grallina cyanoleuca	Magpie-lark			
Grantiella picta	Painted Honeyeater	V	V	N
Gymnorhina tibicen	Australian Magpie			
Haliaeetus leucogaster	White-bellied Sea-eagle	V	–	N
Haliastur sphenurus	Whistling Kite			
Hieraaetus morphnoides	Little Eagle	V	–	N
Hirundo neoxena	Welcome Swallow			
Lalage tricolor	White-winged Triller			
Lichenostomus leucotis	White-eared Honeyeater			
Lophochroa leadbeateri	Pink Cockatoo	V	E	N
Lophoictinia isura	Square-tailed Kite	V	–	N

Scientific name	Common name	Native species		SAII
		BC status	EPBC status	
Malurus leucopterus	White-winged Fairy-wren			
Maluruscyaneus	Superb Fairywren			
Manorina melanocephala	Noisy Miner			
Melithreptus brevirostris	Brown-headed Honeyeater			
Merops ornatus	Rainbow Bee-eater		M	
Microeca fascinans	Jacky Winter			
Milvus migrans	Black Kite			
Mirafra javanica	Horsfield's Bushlark			
Myiagra inquieta	Restless Flycatcher			
Neophema chrysostoma	Blue-winged Parrot	V	V	N
Ninox boobook	Southern Boobook			
Northiella haematogaster	Blue Bonnet			
Nymphicus hollandicus	Cockatiel			
Ocyphaps lophotes	Crested Pigeon			
Pachycephala rufiventris	Rufous Whistler			
Pardalotus punctatus	Spotted Pardalote			
Pardalotus striatus	Striated Pardalote			
Pedionomus torquatus	Plains-wanderer	E	CE	Y
Pelecanus conspicillatus	Australian Pelican			
Petrochelidon ariel	Fairy Martin			
Petrochelidon nigricans	Tree Martin			
Petroica goodenovii	Red-capped Robin			
Phalacrocorax carbo	Great Cormorant			
Phalacrocorax varius	Pied Cormorant			
Phaps chalcoptera	Common Bronzewing			
Philemon citreogularis	Little Friarbird			
Platalea regia	Royal Spoonbill			
Platycercus elegans	Crimson Rosella			
Platycercus eximius	Eastern Rosella			
Platycerus elegans flaveolus	Yellow Rosella			
Plectorhyncha lanceolata	Striped Honeyeater			
Podargus strigoides	Tawny Frogmouth			
Polytelis swainsonii	Superb Parrot	V	V	N

Scientific name	Common name	Native species		SAII
		BC status	EPBC status	
Pomatostomus temporalis	Grey-crowned Babbler (eastern subspecies)	V	–	N
Porphyrio porphyrio	Purple Swamphen			
Psephotus haematonotus	Red-rumped Parrot			
Ptilotula penicillata	White-plumed Honeyeater			
Rhipidura leucophrys	Willie Wagtail			
Smicrornis brevirostris	Weebill			
Struthidea cinerea	Apostlebird			
**Sturnus vulgaris*	Common Starling			
Taeniopygia guttata	Zebra Finch			
Threskiornis moluccus	Australian White Ibis			
Threskiornis spinicollis	Straw-necked Ibis			
Todiramphus sanctus	Sacred Kingfisher			
Tribonyx ventralis	Black-tailed Native-hen			
**Turdus merula*	Common Blackbird			
Vanellus tricolor	Banded Lapwing			
Reptile				
Amphibolurus muricatus	Jacky Dragon			
Lucasium byrnei	Gibber Gecko			
Pogona barbata	Eastern Bearded Dragon			
Suta suta	Curl Snake			
Tiliqua scincoides	Eastern Blue-tongue Lizard			
Tiliqua rugosa	Shingleback Lizard			
Varanus varius	Lace Monitor			
Amphibian				
Crinia parainsignifera	Eastern Sign-bearing Froglet			
Crinia signifera	Common Eastern Froglet			
Limnodynastes dumerilii	Eastern Banjo Frog			
Limnodynastes interioris	Giant Banjo Frog			
Limnodynastes tasmaniensis	Spotted Marsh Frog			
Litoria peronii	Peron's Tree Frog			
Litoria raniformis	Growling Grass Frog, Southern Bell Frog	E	V	N

Appendix I

Species expert reports

Transgrid

May 2026

Victoria to New South Wales Interconnector West (VNI West) (NSW)

Species Expert Report | Brush-tailed Phascogale and Squirrel Glider



Question today
Imagine tomorrow
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Victoria to New South Wales Interconnector West (VNI West) (NSW)
Species Expert Report | Brush-tailed Phascogale and Squirrel Glider

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Approved by:	Rodney van der Ree	28/05/2026	

WSP acknowledges that every project we work on takes place on First Peoples lands.
We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

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Table of contents

1 Introduction 1

1.1 Project description 1

1.2 Justification of use of an expert report 4

1.3 Species expert credentials 4

1.4 Species expert report 5

1.5 Target species 6

2 Methods 9

2.1 Desktop assessment 9

2.2 Field assessment 10

2.3 Species polygons 13

3 Squirrel Glider 14

3.1 Geographic range and distribution 14

3.2 Suitability of habitat structure for shelter and movement 16

3.3 Suitability of habitat for feeding 17

3.4 Patch sizes and connectivity 17

3.5 Field survey results 18

3.6 Conclusion 18

4 Brush-tailed Phascogale 22

4.1 Geographic range and distribution 22

4.2 Suitability of habitat structure for shelter and movement 22

4.3 Suitability of habitat for feeding 23

4.4 Patch sizes and connectivity 23

4.5 Field survey results 24

4.6 Conclusion 24

5 References 25

List of tables

Table 1.1 BAM requirements for the species expert report 5
Table 2.1 The timing and effort of surveys for Squirrel Glider and Brush-tailed Phascogale.....10

List of figures

Figure 1.1 Location of the project 2
Figure 1.2 Overview of VNI West (NSW) Project..... 3
Figure 3.1 Records of the Brush-tailed Phascogale and Squirrel Glider in south-east Australia 14
Figure 3.2 Map of amended project footprint and IBRA subregions 15
Figure 3.3 Squirrel Glider records in the vicinity of the network augmentation works component.....16
Figure 3.4 Squirrel Glider (*Petaurus norfolcensis)* habitat 20

List of photographs

Photo 1.1 Squirrel Glider *Petaurus norfolcensis* Photo: Troy Jennings, WSP 6
Photo 1.2 Brush-tailed Phascogale *Phascogale tapoatafa.* Photo: Danelle Scicluna, WSP..... 6

List of appendices

Appendix A Associated PCTs in the amended project footprint

1 Introduction

1.1 Project description

Transgrid and VicGrid 'VNI West' (formerly Transmission Company Victoria) are jointly developing a new electrical connection between NSW and Victoria called the Victoria to NSW Interconnector West project (VNI West). VNI West would form a second transmission link between NSW and Victoria to harness clean, low-cost electricity from Renewable Energy Zones (REZs) in both states and improve the reliability and security of electricity supply. VNI West is a priority project for the Australian Energy Market Operator (AEMO) and the Commonwealth and NSW and Victorian governments.

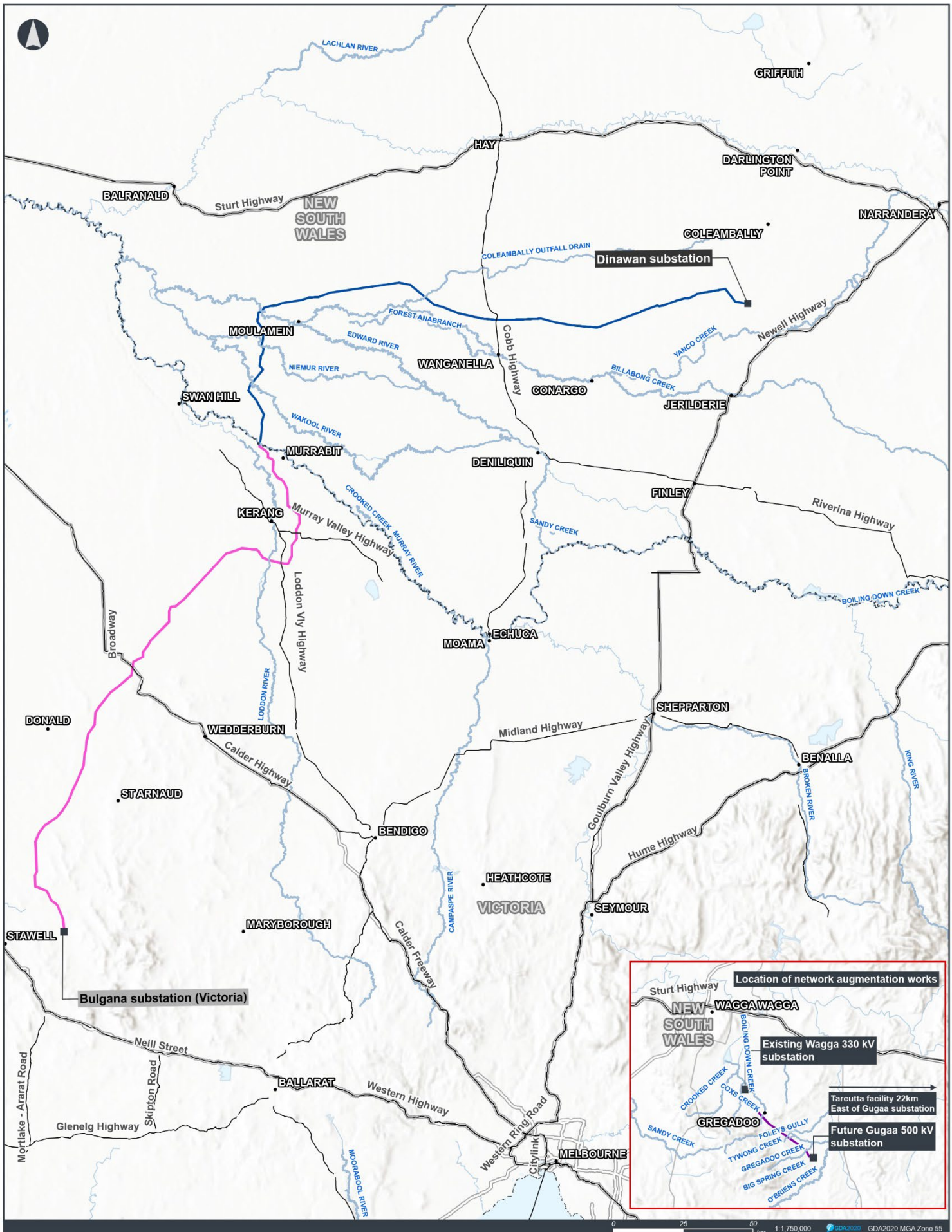
VNI West proposes the construction, operation and ongoing maintenance of a high voltage, 500 kV double circuit overhead transmission line that would connect the high voltage electricity grids in NSW and Victoria. Specifically, VNI West would connect the Western Renewables Link proposal at Bulgana in Victoria with the EnergyConnect (NSW – Eastern section) project (SSI-9172452) at the Dinawan substation in NSW. The connection would be made via a new substation near Kerang in Victoria.

Transgrid is responsible for seeking the required planning approval and delivering the NSW component of VNI West (referred to as 'VNI West (NSW)') in the Riverina Region of NSW and would provide the 500 kV transmission line component of the connection for the VNI West project. The amended project would be located between the NSW/Victorian border near Murrabit in Victoria and Dinawan substation (the 330 kV component of which is has been constructed as part of the EnergyConnect (NSW – Eastern section) project). The amended project would also include replacement of around nine kilometres of an existing single circuit 330 kV transmission line (Line 51) with a double circuit 330 kV transmission line generally between Ivydale Road (south of the existing Wagga 330 kV substation) and the future Gugaa 500 kV substation, Livingstone Gully Road (the substation component of which is subject to separate planning approval as part of the HumeLink project (SSI-36656827)). The amended project would also include an expansion of the Dinawan substation, installation of new shunt reactors and connections works at the existing Wagga 330 kV substation and connection works at the future Gugaa 500 kV substation, Livingstone Gully Road.

VicGrid VNI West, in association with the AEMO Victoria, is responsible for seeking the required planning approval and the delivery of the Victorian component of the VNI West project (VNI West (Victoria)), from the crossing point on the NSW/Victorian border to a connection with the Western Renewables Link near Bulgana, via a new proposed substation near Kerang. The Victorian component is subject to a separate planning and environmental approvals under the applicable Victorian State and Commonwealth jurisdictional requirements.

VNI West (NSW) would be located across four local government area (LGAs) which consist of Edward River, Murray River, Murrumbidgee, and Wagga Wagga LGAs.

Figure 1.1 and Figure 1.2 show the location of the amended project.

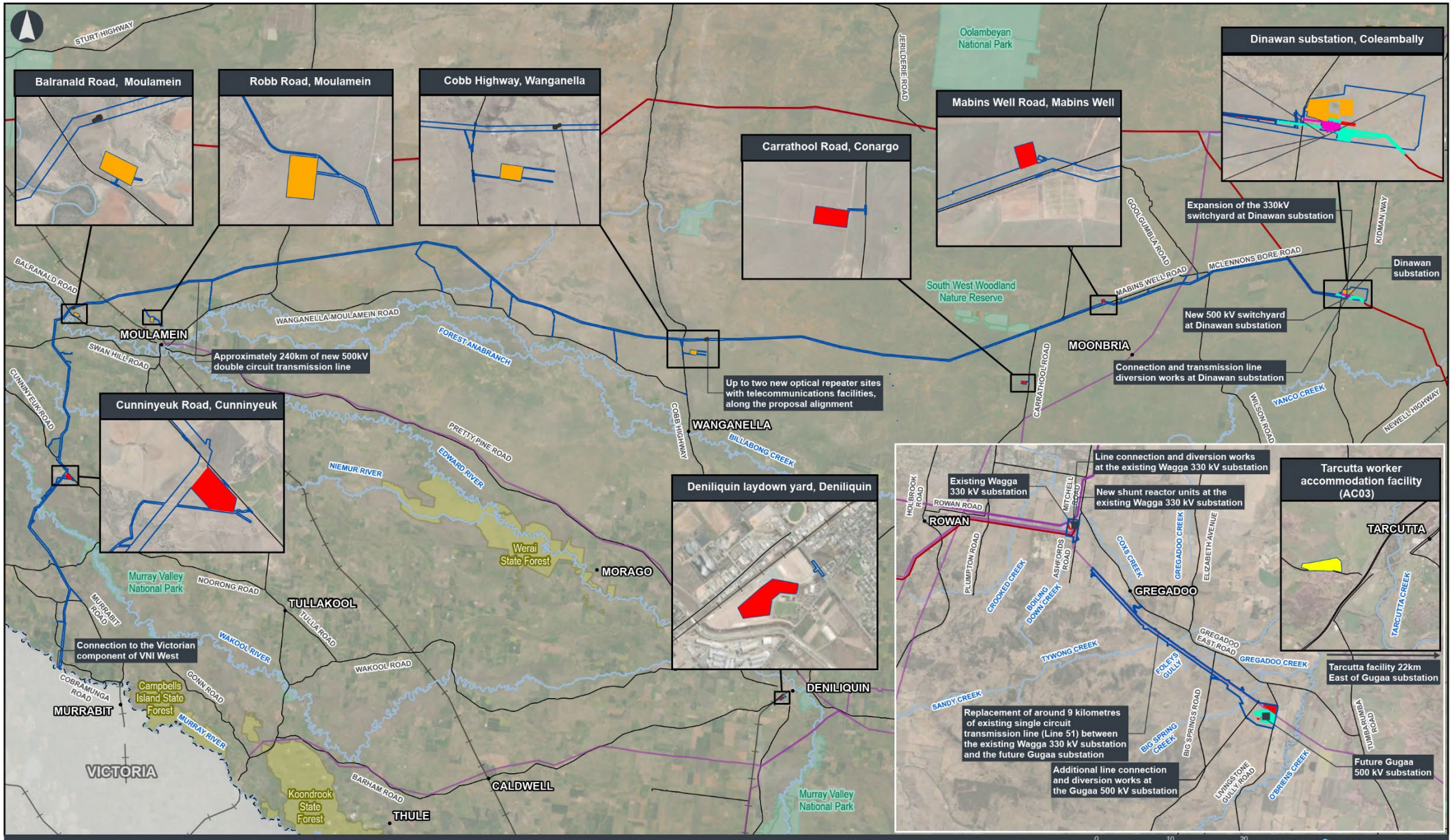


VNI West (NSW)

Figure 1.1
Location of the project

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Data sources: NSW EPI, DELWP, WSP, EnergyConnect



VNI West (NSW)

Figure 1.2
Overview of amended VNI West (NSW)

Legend

- Rail line
- Main road
- Named waterway
- National park
- State forest
- NSW/Victorian border
- Existing transmission line
- EnergyConnect (NSW - Eastern section) project
- Dinawan substation works - existing 330 kV
- Amended project footprint
- Dinawan substation works - proposed 500 kV
- Substation
- Telecommunication facility
- Temporary worker accommodation facility
- Combined temporary worker accommodation facility and construction compound
- Construction compound

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Data sources: NSW EPI, DELWP, WSP, EnergyConnect

1.2 Justification of use of an expert report

Box 3 of the *Biodiversity Assessment Method* (BAM) (DPIE, 2020) states that 'An expert report can be used instead of a species survey for all proposals to determine whether a species is present or not present on subject land (referred to in this report as 'the amended project footprint'). Where an assessor assumes the species is present (except for a proposed biodiversity stewardship site), an expert report may be used to determine the location and area of fauna/flora habitat for the species polygon, and the estimated number of individuals of the flora species'.

Two threatened fauna species, namely the Brush-tailed Phascogale (*Phascogale tapoatafa*) and Squirrel Glider (*Petaurus norfolcensis*) potentially occur in the amended project footprint and may be impacted.

Targeted surveys were undertaken for the Squirrel Glider and Brush-tailed Phascogale as part of *EIS project and summarised in the Technical paper 1 –Biodiversity Development Assessment Report* the Surveys were completed in April and May 2024, consisting of 13 sites surveyed by 44 cameras across a total of 3,349 trap nights.

However, due to a combination of access restrictions, seasonal limitations and large areas of suitable habitat, gaps remained in targeted fauna survey effort. To address these gaps and add to existing survey results, an expert report was commissioned to assess the likely presence of the Squirrel Glider and Brush-tailed Phascogale within the subject land. The species expert report was completed as part of the EIS project and updated as part of the revised BDAR.

1.3 Species expert credentials

Dr Rodney van der Ree is an approved Species Expert for the Squirrel Glider and Brush-tailed Phascogale and is registered as such under the BAM, with the following qualifications:

- Bachelor of Science (1st Class Hons), Deakin University (1994)
- Doctor of Philosophy, Deakin University (2000).

The breadth of his relevant experience in relevant ecological research and survey methods includes, but is not limited to:

- surveyed for Squirrel Gliders and Brush-tailed Phascogales and undertook detailed studies of their ecology as a central part of PhD in central Victoria, 1995–2000
- surveyed for Squirrel Gliders and Brush-tailed Phascogales as part of arboreal marsupial studies about the impacts of roads and traffic on wildlife in northern Victoria and South West slopes of NSW, 2005–2015
- developed and tested the effectiveness of different mitigation treatments to ameliorate the impacts of roads and traffic on both species, including the use of rope bridges and glider poles, 2005–ongoing
- radio-tracked Brush-tailed Phascogales in central Victoria during PhD, 1998–2000
- targeted surveys for Brush-tailed Phascogales for VicRoads/MRPV 2013–15, 2019, and Hume City Council 2018
- targeted surveys for Squirrel Gliders Phascogales using spotlighting, cage and Elliot traps and infra-red remotely triggered camera traps for VicRoads/MRPV and NSW RMS/TfNSW between 2000 and present on numerous projects
- targeted surveys for Squirrel Gliders using cage traps for NSW OEH in approximately 2005–2012 on the SW slopes of NSW, including Albury, Thurgoona, Burrumbuttock, Wagga Wagga, Tarcutta, Holbrook, etc
- targeted surveys for Squirrel Gliders for Transgrid for various transmission line projects
- developed a monitoring program for Squirrel Gliders at Thurgoona and Wirlinga.

His involvement in relevant projects over the past 10 years include but are not limited to the following:

- Echuca-Moama 2nd bridge crossing, Victoria and NSW, Australia (2015–current): VicRoads/MRPV and TfNSW Biodiversity Specialist
- EnergyConnect (NSW – Eastern section) project, Wagga Wagga to Hay Plains, NSW, Australia 2020–2022
- Shepparton Bypass, Shepparton, Victoria, Australia (2017–2019): VicRoads, Biodiversity Specialist
- Western Highway Duplication Project, Sages 1, 2 and 3, western Victoria, Australia (2014–2019): VicRoads and Major Roads Project Authority, Biodiversity Specialist
- Jumping Creek Road Upgrade Project, Victoria, Australia (2021 to present): City of Manningham
- Surveys for Northern Phascogale, Mornington Wildlife Sanctuary, Kimberley, W.A. (2018–2019): Australian Wildlife Conservancy
- Yan Yean Road Stage 1 widening, Yan Yean, Victoria, Australia (2017–2019): VicRoads and MRPA, Biodiversity Specialist
- Illabo to Stockinbingal Inland Rail Project, NSW (2024–present): ARTC, Inland Rail Pty Ltd, John Holland
- Glider Connectivity Strategy for Hume Link East/Hume Link West, NSW (2025–present): Transgrid and Acciona/UGL, respectively.

1.4 Species expert report

1.4.1 BAM assessment requirements

The requirements of an expert report are outlined in Box 3 of the BAM and the location of each component in this expert report are summarised in Table 1.1.

Table 1.1 BAM requirements for the species expert report

Box 3 Requirement for expert report		Squirrel Glider	Brush-tailed Phascogale
1	Identify the species or population	Sections 1.5.1 and 3.1	Sections 1.5.2 and 4.1
2	Justify the use of an expert report	Section 1.2	
3	Justify the likelihood of occurrence of the species or population and prepare a species polygon as per Subsection 5.2.5 of BAM	Section 3.6	Section 4.6
4	Estimate the area of habitat (if the species is assessed by area) or the maximum number of individuals (if the species is assessed by count of individuals) on the amended project footprint. Evidence such as a population estimate from a reference site could be used to justify this estimation	Section 3.6	Section 4.6
5	Include the information considered in making this determination	Sections 1.5.1 and 3.1 Section 5	Sections 1.5.2 and 4.1 Section 5
6	State the expert's credentials	Section 1.3	

1.4.2 Report structure

This expert report covers two distinct areas within the amended project, being the NSW/Victorian border to Dinawan substation component and the network augmentation works component. Because the two areas are distinctly different, and located more than 100 kilometres apart, they are treated separately in this report.

- Section 1.5 provides a summary of relevant aspects of the ecology and biology of the two target species relevant to both the NSW/Victorian border to Dinawan substation component and the network augmentation works components.
- Section 2 describes the methods used for the desktop and field-assessments undertaken to prepare this expert report.
- Section 3 provides the Squirrel Glider expert report pertaining to both sections of the amended project footprint.
- Section 4 provides the expert report for Brush-tailed Phascogale pertaining to both sections of the amended project footprint.
- Section 5 identifies the relevant references used to support the assessment.

1.5 Target species

The two target species of this expert report are the Squirrel Glider, *Petaurus norfolcensis* (Photo 1.1), and the Brush-tailed Phascogale, *Phascogale tapoatafa* (Photo 1.2).



Photo 1.1 Squirrel Glider *Petaurus norfolcensis* Photo: Troy Jennings, WSP



Photo 1.2 Brush-tailed Phascogale *Phascogale tapoatafa*. Photo: Danelle Scicluna, WSP

1.5.1 Squirrel Glider

The Squirrel Glider is a medium sized (approximately 190–300 grams) arboreal gliding marsupial that occurs in dry sclerophyll forests and woodlands in eastern mainland Australia, typically up to 300 metres above sea level (van der Ree and Suckling 2023). The species distribution extends along the Great Dividing Range from central Cape York in Queensland, south to central Victoria with some isolated occurrences in eastern South Australia (van der Ree and Suckling 2023). In northern NSW and Queensland, Squirrel Gliders extend into coastal forests and wetter swamp forests (Rowston et al. 2002, Smith and Murray 2003).

The Squirrel Glider is threatened with extinction by the loss and fragmentation of habitat for agricultural (Claridge and van der Ree 2004) and urban development (Goldingay and Sharpe 2004, Francis et al. 2015), habitat degradation primarily through the decline in hollow-bearing trees, mortality through predation, entanglement on barbed wire fencing (van der Ree 1999) and wildlife-vehicle collision (McCall et al. 2010, Soanes et al. 2016). Consequently, the Squirrel Glider is listed as:

- vulnerable in NSW under the *Biodiversity Conservation Act 2016* (BC Act), including the listing of the species in the Wagga Wagga Local Government Area and on the Barrenjoey Peninsula north of Sydney as 'endangered populations'.

Squirrel Gliders are not listed nationally under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Squirrel Gliders feed mainly on arboreal insects, nectar, pollen and tree sap, and occasionally vertebrates and eggs (Menkhorst and Collier 1987, Holland 2001, Holland et al. 2007). Squirrel Gliders are more common and abundant in areas of dry forest and woodland that support a mix of three to four overstorey species of *Eucalyptus*, *Corymbia* and/or *Angophora* species that ideally provide overlapping flowering during winter and spring (Rowston et al. 2002, van der Ree and Suckling 2023). The mid-storey in high-quality habitat includes *Acacia* and *Banksia* species. A list of associated Plant Community Types (PCTs) of the Squirrel Glider that occur within the amended project footprint can be found in Appendix A.

Squirrel Gliders live in groups of related individuals which defend a local territory. Social groups generally consist of an adult male, an adult female and their offspring or siblings and can include up to eight individuals. Squirrel Gliders den communally in the hollows of old growth trees, commonly utilising multiple den trees within their home range (Traill and Lill 1997, van der Ree 2000, Crane et al. 2008, Crane et al. 2010). Hollow bearing trees are a critical resource, without which Squirrel Gliders are unable to shelter and raise young. Female Squirrel Gliders usually give birth to one or two young between April and November and may produce a second litter if sufficient resources are available (van der Ree 2002).

The average home range of the Squirrel Glider is between two and 10 hectares and in some locations up to 15 hectares in size, with home range size influenced by the shape and quality of the available habitat (Quin 1995, van der Ree and Bennett. 2003, Sharpe and Goldingay 2007, Goldingay et al. 2010, Brearley et al. 2011). Squirrel Gliders are capable of utilising relatively small patches of habitat, including narrow strips along roads and waterways and within urban areas, provided they are well-connected to larger areas of habitat.

Squirrel Gliders primarily move by gliding from tree to tree, with average glide lengths of 30 to 40 metres, and a maximum of approximately 70 metres (depending on tree height) (van der Ree and Bennett. 2003). While larger gap sizes may occasionally be traversed by coming to the ground, Squirrel Gliders are easily preyed on by predators such as owls, foxes and cats and therefore they typically avoid moving along the ground. Consequently, their movements are limited by the availability of canopy cover within gliding distance.

1.5.2 Brush-tailed Phascogale

The Brush-tailed Phascogale, *Phascogale tapoatafa,* is a small (around 110 to 310 grams), semi-arboreal marsupial carnivore with a broad but highly fragmented distribution around the periphery of Australia (Aplin et al. 2015). A recent reconsideration of the species has concluded there are indeed two species, with *P. pirata* endemic to the top end in the Northern territory and *P. tapoatafa* elsewhere. *P. tapoatafa* is made of three geographically disjunct subspecies:

- *P. tapoatafa tapoatafa* – southeast Australia from South Australia to mid-coastal Queensland
- *P. tapoatafa wambenger* – southwest Western Australia
- *P. tapoatafa kimberleyensis* – Kimberley region of Western Australia.

P. tapoatafa tapoatafa is the only sub-species to occur in NSW and unless otherwise explicitly stated, all references to the Brush-tailed Phascogale refers to this sub-species.

The Brush-tailed Phascogale is threatened with extinction by the loss and fragmentation of habitat for agricultural and urban development, habitat degradation primarily through the decline in hollow-bearing trees, mortality through predation by foxes and cats, and wildlife-vehicle collision (Terry 2020). Consequently, the Brush-tailed Phascogale is listed as vulnerable in NSW under the BC Act. The species is not listed nationally under the EPBC Act.

Brush-tailed Phascogales are rat-sized dasyurids, with a head and body length of around 20 centimetres and bottle-brush shaped tail of similar length (Soderquist and Rhind 2008). The species mainly feed on large insects, spiders and nectar, and given the opportunity, will take small vertebrates such as skinks (Traill and Coates 1993, Scarff et al. 1998, Soderquist and Rhind 2008). Most foraging occurs on trees with rough bark because they are easier to climb and contain more food items under the peeling bark than smooth-barked trees (Traill and Coates 1993, Soderquist and Rhind 2008). Larger-diameter trees are also preferred for foraging (including for *P. pirata* Geyle et al. 2020), likely because they contain more microhabitats and food resources than smaller trees. Despite these preferences, the species can still utilise smooth-barked trees, particularly when they are in flower and provide an abundant source of nectar. Large fallen logs and branches are also used for foraging (Scarff et al. 1998) and providing shelter for the species as they move between trees at ground level.

Brush-tailed Phascogales are generally associated with box, ironbark, and stringybark eucalypt species in dry sclerophyll forests with sparse ground cover of grasses, herbs, shrubs and leaf litter (Cuttle 1982, Biosis Research 2001). The species can also be found in a wide range of other habitat types, including heath, swamps, rainforest and wet sclerophyll forest (Soderquist and Rhind 2008).

Brush-tailed Phascogales are hollow-dependent, utilising multiple habitat trees within their territories, and appear to preferentially use hollows with small entrance sizes (2.5 to four centimetres across) in standing trees, tree stumps and fallen logs for denning and raising young (Soderquist 1993, Traill and Coates 1993, Rhind 1996, van der Ree et al. 2006). The species prefer to utilise hollows in large-diameter trees, with average diameter at breast height (DBH) of den trees in central Victoria being greater than 80 centimetres (van der Ree et al. 2006), although hollows in very small trees (e.g. down to 25 centimetres DBH), in coppice stumps and tree stumps will also be used. Multiple hollows are used by individuals, with seven females in central Victoria using an average of 11 hollow-bearing trees over an average er of 25 tracking days (van der Ree et al. 2006). However, preliminary results of a radiotracking program of 16 female and 13 male Brush-tailed Phascogales in regrowth forest in central Victoria found them using smaller trees, with standing dead trees providing a significant proportion of selected den trees (Terry 2022).

The species normally den alone, although some records of communal denning have been observed (Rhind 2003). Maternity dens are particularly important because females will deposit their young at an early age (approximately 48 days old) while they forage nearby, frequently returning to the den to feed their young (Soderquist 1993). Maternity dens are preferentially located in large tree hollows with tight entrance holes to prevent access by potential predators.

Brush-tailed Phascogales have relatively large home ranges for their body size, with females traversing 20 to 40 hectares, and males occupying 100 hectares or more (Soderquist 1995, van der Ree et al. 2001). However, in high-quality habitats, their home ranges can be much smaller, even down to five hectares in size (van der Ree et al. 2001, Terry 2022). Female home ranges do not overlap with each other, while the home ranges of males overlap extensively with both females and other males (Soderquist 1995, van der Ree et al. 2001). Importantly, the species will traverse cleared farmland up to distances of a few hundred metres (van der Ree et al. 2001, Terry 2022).

2 Methods

2.1 Desktop assessment

Areas of woodland in the amended project footprint were identified from satellite imagery and patches or groups of scattered trees in excess of approximately two to five hectares in size were selected for field assessment as this is the minimum size that can support Squirrel Gliders and Brush-tailed Phascogales in the short-term. Both species can traverse only relatively small gaps of cleared farmland, with Squirrel Gliders constrained by glide length (typically 30 to 40 metres and occasionally up to 70 metres) and Brush-tailed Phascogales a few hundred metres. Consequently, a small patch size was adopted to be conservative.

Records of Squirrel Gliders and Brush-tailed Phascogales were downloaded from BioNet, the Atlas of Victorian Wildlife and the Atlas of Living Australia (ALA) for NSW and Victoria on 13th February 2025. Records from ALA were included in the search on 4th March 2025, including unverified records as a conservative approach. Records from the Atlas of Victorian Wildlife were assessed for the Murray Fans component of the study area where potential habitat occurs along the NSW/Victoria border and therefore informs the likely presence of these species in those areas. Updated BioNet records were included on 1st May 2026. Duplicate records from overlapping databases were excluded.

A literature review was undertaken to assess adjacent projects including Project Energy Connect (PEC) (WSP, 2022) and HumeLink (Niche Environment and Heritage, 2024) for surveys of both species and the outcomes were:

PEC:

- Survey methods for both species included arboreal Elliott trapping, remote cameras and call playback.
- Squirrel Gliders were recorded only in linear roadside vegetation east of Lockhart.
- Not recorded in the South Olary Plain, Lachlan or Murrumbidgee IBRA subregions.
- The Wagga Wagga endangered Squirrel Glider population was not recorded within the Wagga Wagga LGA during targeted surveys and was therefore considered not an affected species.
- Phascogale was not recorded and considered not an affected species.

Humelink:

- Squirrel Glider survey methods included remote cameras, arboreal hair tubes, stag watching and nocturnal call playback.
- Species was part recorded and part assumed present within the amended project footprint.
- Recorded individuals included:
  - three individuals in Crookwell (PCT 1151)
  - two in Inland Slopes (PCT 268 and 277)
  - three in Murrumbateman (PCT 238 and non-native)
  - one individual in Snowy Mountains (PCT 1196).
- The Wagga Wagga endangered Squirrel Glider population was assumed present in parts of the amended footprint due to survey limitations and considered likely to occur.
- Phascogale was assumed present; baited arboreal Elliott trapping was identified as the preferred method but considered not feasible due to required survey effort and low expected detection rates.

The following desktop parameters were assessed when considering the potential presence of each of the target species:

- distribution of existing records
- extent of overlap between species records and IBRA subregions
- extent of overlap between species records and habitat types in the amended project footprint
- size of patches of woodland habitat
- degree of connectivity among patches of woodland within the amended project footprint and adjacent areas
- results of surveys conducted by the project team.

2.2 Field assessment

Numerous surveys for both species were conducted as part of the BDAR, including targeted surveys for the species and other surveys where they would be detected incidentally. The timing and effort for each survey method is provided in Table 2.1 and described in more detail in section 2.2.1 to 2.2.3.

Table 2.1 The timing and effort of surveys for Squirrel Glider and Brush-tailed Phascogale

Targeted species	Survey period (TBDC)	Survey type	Survey dates & effort
Squirrel Glider	Year-round	Spotlighting	21 Aug 24: 4 people x 6.75 hrs 22 Aug 24: 4 people x 7.5 hrs 23 Aug 24: 4 people x 6.75 hrs 24 Aug 24: 4 people x 6.75 hrs 25 Aug 24: 2 people x 2.25 hrs 26 Aug 24: 4 people x 6 hrs
		Camera trapping including rebaiting	03 Apr 24: 2 people x 10 hrs 04 Apr 24: 2 people x 10 hrs 05 Apr 24: 2 people x 10 hrs 15 Apr 24: 2 people x 7.5 hrs 16 Apr 24: 2 people x 7.5 hrs 17 Apr 24: 2 people x 7.5 hrs 18 Apr 24: 2 people x 7.5 hrs 07 May 24: 2 people x 10 hrs 08 May 24: 2 people x 10 hrs 09 May 24: 2 people x 10 hrs 01 Oct 24: 2 people x 10 hrs
		Habitat assessment	3–6 February 2025 (border to Dinawan)

Targeted species	Survey period (TBDC)	Survey type	Survey dates & effort
Squirrel Glider – Wagga Wagga population	Year-round	Incidental spotlighting while targeting nocturnal birds	30 Nov 25: 7 hours 01 Dec 25: 7 hours 02 Dec 25: 7 hours 03 Dec 25: 7 hours 04 Dec 25: 7 hours 05 Dec 25: 7 hours
		Habitat assessment	24–27 February 2025 (Wagga – Gugaa).
Brush-tailed Phascogale	December – June	Camera trapping including rebaiting	03 Apr 24: 2 people x 10 hrs 04 Apr 24: 2 people x 10 hrs 05 Apr 24: 2 people x 10 hrs 15 Apr 24: 2 people x 7.5 hrs 16 Apr 24: 2 people x 7.5 hrs 17 Apr 24: 2 people x 7.5 hrs 18 Apr 24: 2 people x 7.5 hrs 07 May 24: 2 people x 10 hrs 08 May 24: 2 people x 10 hrs 09 May 24: 2 people x 10 hrs 01 Oct 24: 2 people x 10 hrs
	Year-round	Habitat assessment	3–6 February 2025 (border to Dinawan) 24–27 February 2025 (Wagga – Gugaa).

Species surveys were undertaken in accordance with published guidelines available for the species including the Bionet Threatened Biodiversity Data Collection (TBDC) guidelines {NSW DCCEEW, 2026 #4322}.

Survey guidance for Squirrel Glider is limited but survey was undertaken during the prescribed survey timeline (year-round). Surveys were conducted under the prescribed guideline for Brush-tailed Phascogale which outlines a requirement for baited camera traps to be undertaken during the prescribed survey season (December to June).

2.2.1 Remote cameras

Remote cameras were used to assess potential presence of the species within the amended project footprint in accordance with the approved guidelines under the BAM. Remote motion sensing infra-red cameras were used as a survey method, in place of terrestrial and arboreal traps, due to increased potential for fauna to be attracted to baited traps with a high likelihood of the specimen being photographed (unharmed), as compared to often lesser successful and more dangerous traditional trapping methods. Each species recorded on each camera was identified (threatened and non-threatened) and if the target species could not be identified in the first instance, the imagery was viewed by the species expert. Remote camera traps were used to survey for both Squirrel Glider and Brush-tailed Phascogale.

Suitable habitat was identified using mapping of associated PCTs, location of records and known habitat requirements for the species. Remote camera traps were set in trees (at minimum heights of 1.5–2 metres) in areas of suitable habitat with a suitable baited food source used to entice a range of target species within the appropriate microhabitat. Bait contained a mix of rolled oats, peanut butter, golden syrup and truffle oil and target trees were sprayed with a five to one:1 water to honey solution to attract nectivorous mammals. Baits were replaced after two weeks of camera trap deployment to ensure they remained attractive for the life of the survey.

Forty-four cameras were installed across 13 sites for a total of 3,349 trap nights across the subject land. Cameras were installed for a minimum of four weeks from early April to early May 2024. A total of 16 cameras remained on site after the 4-week survey period due to access restrictions; these cameras were collected in early September and October.

2.2.2 Spotlighting

Incidental spotlighting surveys were undertaken as part of targeted surveys for threatened nocturnal birds in December 2025. Spotlighting was conducted within a one hectare circular plot of the survey point following call playback (for owls) and included searches of locations containing large hollow-bearing trees. Spotlighting was undertaken for at least 15 minutes at each site. Six nights of spotlighting survey were undertaken across five locations within the network augmentation works component (Wagga 330 kV substation to the future Gugaa 500 kV substation).

Within the NSW/Victorian border to future Dinawan substation component of VNI West, incidental spotlighting surveys were completed as part of targeted surveys for Koala *Phascolarctos cinereus.* Spotlighting surveys were undertaken in accordance with *Koala (Phascolarctos cinereus): Biodiversity Assessment Method Survey Guide* (DPE 2022) with two transects (each minimum 200 metres) spotlighted per five hectares habitat within the subject land. Transects were placed 100 metres apart to reduce the chance of overlap between observers and surveyed at a rate of 10 metres/minute. Each spotlighting site was surveyed for at least two consecutive nights.

2.2.3 Habitat assessment

Two WSP ecologists assessed habitat suitability for the Brush-tailed Phascogale and Squirrel Glider in the NSW/Victorian border to future Dinawan substation component of VNI West on February 3–6, 2025. A habitat assessment was completed by two ecologists from February 24–27, 2025 for the network augmentation works component.

During the site visits, the following habitat characteristics were assessed and noted:

- species composition of the overstorey vegetation
- presence and abundance of any *Acacia* mid-storey (foraging habitat for Squirrel Gliders)
- presence and abundance of large old trees and trees with hollows suitable for use by the target species (minimum entrance size of four to five centimetres for Squirrel Gliders and 2.5 to five centimetres for Brush-tailed Phascogales)
- extent of connectivity among patches of woodland.

2.3 Species polygons

Due to limitations such as seasonal survey constraints, adequate targeted fauna surveys for Squirrel Gliders and Brush-tailed Phascogales could not be completed. Therefore, field surveys were undertaken by WSP ecologists to determine the presence of suitable habitat characteristics for the Squirrel Glider and Brush-tailed Phascogale (as listed in section 2.2) in order to identify and map species polygons as per Subsection 5.2.5 of BAM.

Sufficient suitable habitat was determined based on the associated Plant Community Types, TBDC (2025) survey requirements and scientific literature (see section 1.5). Habitat polygons included specific requirements such as:

- composition of the overstorey and mid-storey tree and shrub species to provide food resources and suitable climbing substrate for Brush-tailed Phascogales and Squirrel Gliders
- size of the patch of woodland
- presence and abundance of suitably-sized tree hollows
- proximity to other patches of woodland, the size of the gap between the patches of woodland (up to approximately 70 to 100 metres for Squirrel Gliders and approximately 250 metres for Brush-tailed Phascogale) and the presence of significant barriers to movement, such as farmland, roads and urban areas.

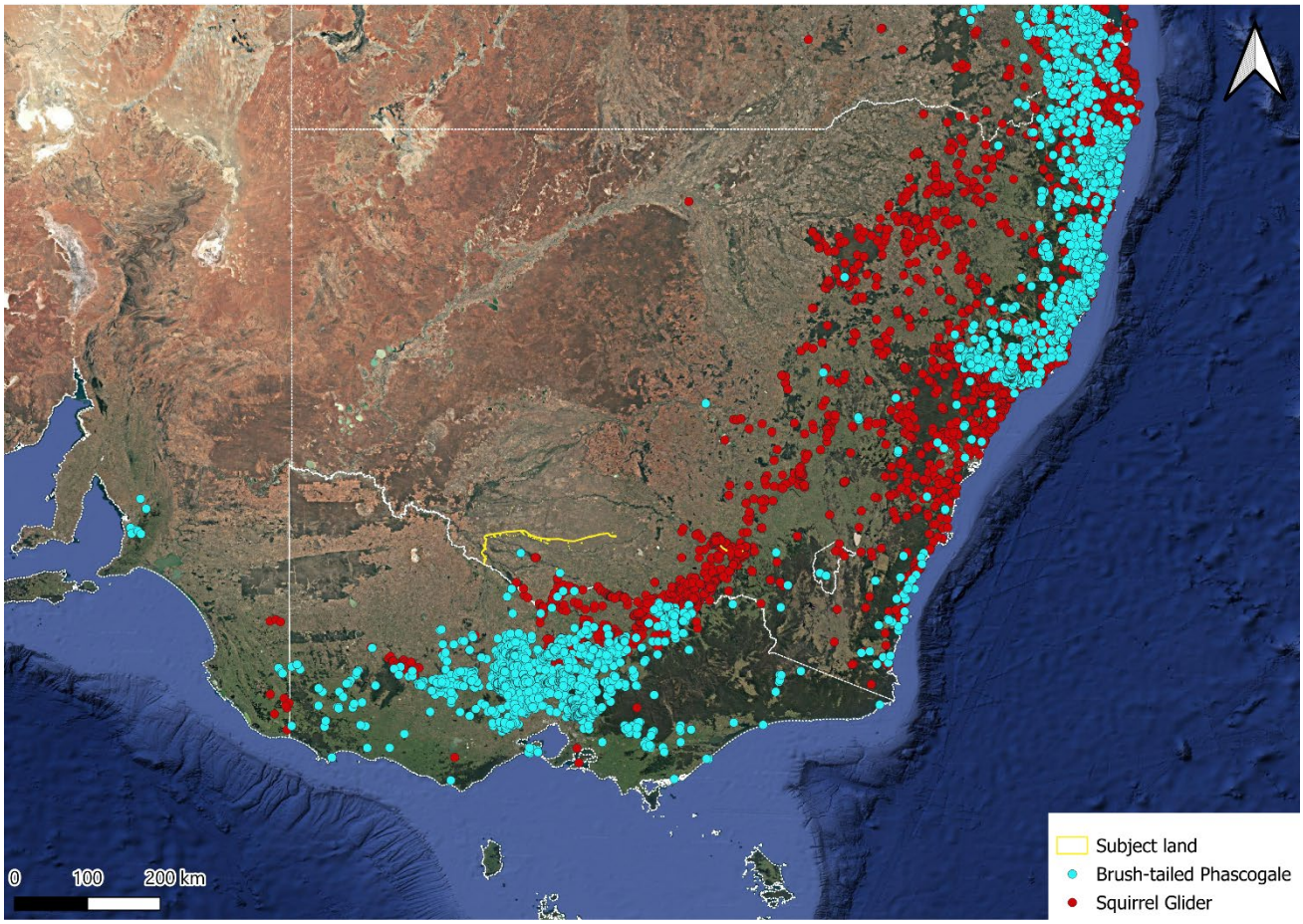
3 Squirrel Glider

3.1 Geographic range and distribution

3.1.1 NSW/Victorian border to Dinawan substation component

The Squirrel Glider occurs along the coast in NSW and on the inland slopes of the Great Dividing Range in NSW and Victoria (Figure 3.1). The closest record of a Squirrel Glider is located 29.5 kilometres to the south of the amended project footprint, just north of Moonahcullah Cemetery, and was collected in 2011.

The NSW/Victorian border to Dinawan substation component of amended project is well outside the current known distribution of the Squirrel Glider.



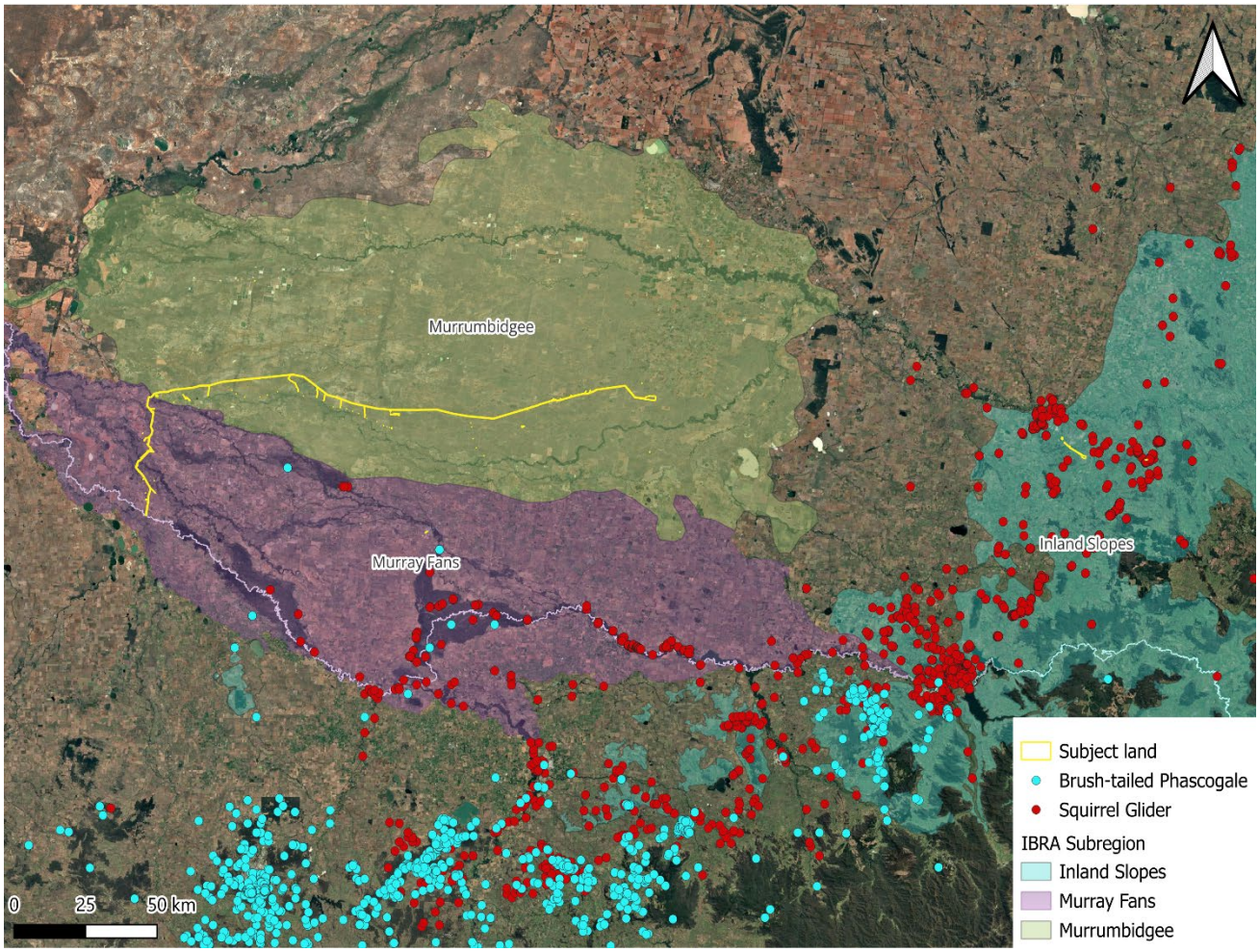
Data from Atlas of Victorian Wildlife, BioNet and Atlas of Living Australia

Figure 3.1 Records of the Brush-tailed Phascogale and Squirrel Glider in south-east Australia

There are records of Squirrel Glider within the Murray Fans IBRA subregion. Importantly, all records of Squirrel Glider within the Murray Fans IBRA subregion are associated with major waterways, including the Murray River and Edward River (Figure 3.2).

There are no records of Squirrel Glider in the Murrumbidgee IBRA subregion, in which the majority of the amended project footprint is located.

There are no records of Squirrel Glider in woodland that isn't associated with major waterways in the vicinity of the NSW/Victorian border section to Dinawan substation component of the amended project.

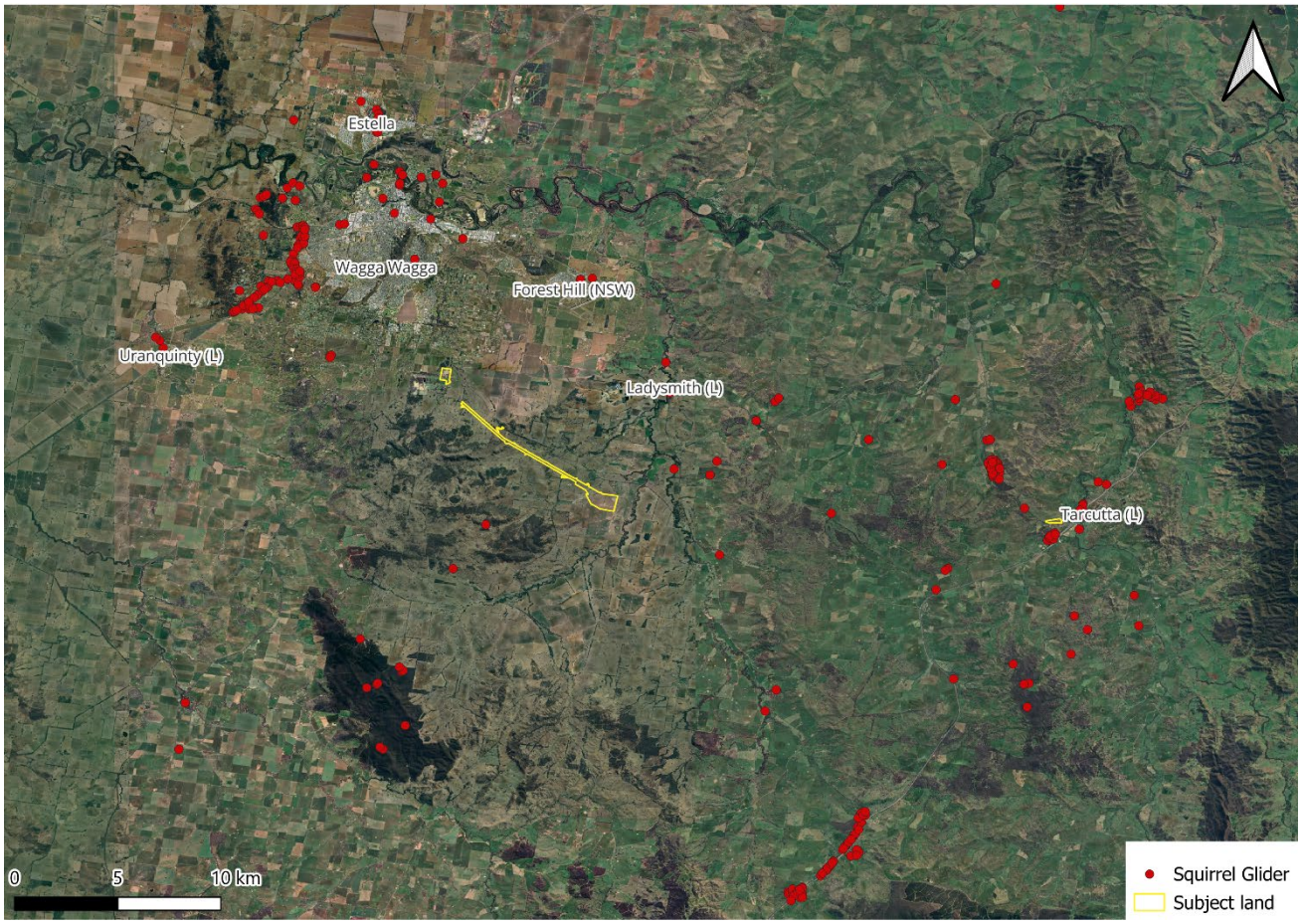


Data from Atlas of Victorian Wildlife, BioNet and Atlas of Living Australia

Figure 3.2 Map of amended project footprint and IBRA subregions

3.1.2 *Network augmentation works component*

The amended project footprint for this component of the amended project occurs within the known geographic range of the Squirrel Glider (Figure 3.1), with numerous records occurring within 10 kilometres of the amended project footprint (Figure 3.3). The previous closest record of Squirrel Glider to the network augmentation works component was along Kyeamba Creek, 2.7 kilometres to the east of the portion of the amended project footprint situated in Gregadoo and was recorded in January 2025. The record made by WSP (see section 3.5.2) along Big Springs Rd in December 2025 occurred just 35 metres to the south of the amended project footprint in similar habitat to that within the amended project.
The network augmentation works component is located within the Inland Slopes IBRA subregion, in which the Squirrel Glider is also known to occur (Figure 3.2).



Data from Atlas of Victorian Wildlife, BioNet and Atlas of Living Australia (no Brush-tailed Phascogale records present)

Figure 3.3 Squirrel Glider records in the vicinity of the network augmentation works component

3.2 Suitability of habitat structure for shelter and movement

3.2.1 *NSW/Victorian border to future Dinawan substation component*

The primary feature of the structure of the habitat for Squirrel Gliders is sufficient suitably sized tree hollows, with a minimum entrance size of four to five centimetres, for denning and raising young.

The majority of locations inspected within the amended project footprint from the NSW/Victorian border to Dinawan substation contained numerous hollows for Squirrel Gliders and thus the habitat is generally structurally suitable for the species to occupy and persist in.

3.2.2 Network augmentation works component

The woodland habitat along this section of the amended project footprint contains sufficient hollow bearing trees to provide shelter and denning opportunities for Squirrel Gliders.

3.3 Suitability of habitat for feeding

3.3.1 NSW/Victorian border to Dinawan substation component

The Squirrel Glider prefers woodland and forest with mixed-species of *Eucalyptus* and *Corymbia*, and a mid-storey with gum-producing *Acacia*, *Banksia* and *Grevillea* species, which when combined, provides flower resources throughout the year, and especially during winter. While Squirrel Gliders can persist in single-species stands of woodland, this primarily occurs in south-east Australia in areas that support high quality woodland, such as on fertile soils and areas with higher and/or more reliable rainfall (van der Ree 2000, van der Ree and Suckling 2023).

The Black Box woodlands throughout the indicative disturbance footprint, except those associated with the major waterways, were primarily single-species stands of eucalypt woodland, and are unable to provide the year-round resources required to support viable populations of Squirrel Gliders.

The woodlands along the major waterways were dominated by River Red Gum, which graded into Grey Box and then Black Box with increasing distance from the waterway. These areas are suitable for Squirrel Gliders because the combination of these three *Eucalyptus* species, along with scattered *Acacia* in the mid-storey, are able to provide resources across a larger portion of the year for Squirrel Gliders.

In summary, the pure stands of Black Box woodlands are unlikely to provide sufficient year-round resources for Squirrel Gliders while the woodland along the major waterways with a multi-species overstorey is likely able to support Squirrel Gliders.

3.3.2 Network augmentation works component

The woodland habitat in this section includes a mix of Grey Box, White Box, Yellow Box and other overstorey species to provide flowering resources spanning multiple months. However, the middle-storey is largely absent and provides no additional resources for Squirrel Gliders.

3.4 Patch sizes and connectivity

3.4.1 NSW/Victorian border to Dinawan substation component

There is no published data on the minimum sizes of habitat patches and extent of habitat connectivity required for the persistence of Squirrel Gliders in the south-west of NSW. In the absence of such information, typical or expected home range sizes in this low-suitability woodland can be a useful guide. The size of home ranges of Squirrel Gliders in high-quality woodland on fertile soils near Euroa was approximately two to five hectares and up to 15 hectares in regrowth box-ironbark woodland on rocky soils in northern Victoria (Traill 1995) and similarly at a site on the north coast of NSW (Goldingay et al. 2010). Therefore, patches in habitat on the edge of the species range for this area of amended project footprint would likely need to be 10 to 20 hectares in size to support a single colony or family group of Squirrel Gliders and would need to be at 100 hectares in size to support a small number of colonies. In addition, these patches would need to be relatively well-connected to enable gliders to move among patches and recolonise patches after local extinctions, which is likely to occur more frequently at the edge of their range than within core areas. Therefore, the only patches of woodland habitat that are likely large enough and well-connected to support Squirrel Gliders is likely to occur along the Murray and Edward rivers.

3.4.2 Network augmentation works component

The woodland habitat in the amended project footprint is highly cleared and fragmented. However, the existing woodland, which occurs primarily in road reserves and along waterways, is similar in extent and connectivity to areas where the species has been detected across the Inland Slopes of NSW and north-east Victoria, including within the vicinity of Wagga Wagga. Therefore, much of the woodland within the amended project footprint, especially that which occurs along and adjacent to waterways and roadsides, is expected to support Squirrel Gliders.

3.5 Field survey results

3.5.1 NSW/Victorian border to Dinawan substation component

Spotlighting and arboreal camera trapping was undertaken by WSP at various locations within the amended project footprint as part of general and targeted surveys for the BDAR in 2024 and 2025. The detailed methods are given in section 2 of this report and in section 2.5.3 of the Revised BDAR and the results are given in section 5.3 of the Revised BDAR.

The most frequently detected arboreal marsupials were the Common Brushtail Possum and Krefft's Gliders.

No Squirrel Gliders were detected during these surveys.

Additional habitat suitability assessments were undertaken in early February 2025 and are discussed in more detail in section 2.2 of this report. No Squirrel Gliders were detected during these additional assessments.

3.5.2 Network augmentation works component

While no specific targeted surveys were undertaken for Squirrel Glider in this section, six nights of nocturnal spotlighting was undertaken in the largest patches of hollow-bearing trees during December 2025. The most frequently detected arboreal mammals during these surveys included Common Brushtail Possums and Common Ringtail Possums. However, one individual identified as likely to be Squirrel Glider was recorded in associated habitat just south of the amended project footprint along Big Springs Road. A habitat suitability assessment was updated following this sighting, to account for any additional habitat areas within the amended project footprint and to update the associated species polygon.

3.6 Conclusion

3.6.1 NSW/Victorian border to Dinawan substation component

The only woodland that has the potential to support Squirrel Gliders in the vicinity of the Dinawan to the border section is the River Red Gum/Grey Box/Black Box woodland (refer to relevant River Red Gum/Grey Box/Black Box PCTs in Appendix A) along the major waterways (i.e. Murray River and Edward River). However, the amended project footprint is well outside the current known distribution of Squirrel Gliders and this expert report concludes that there are no Squirrel Gliders within the amended project footprint or even within the vicinity of the amended project footprint.

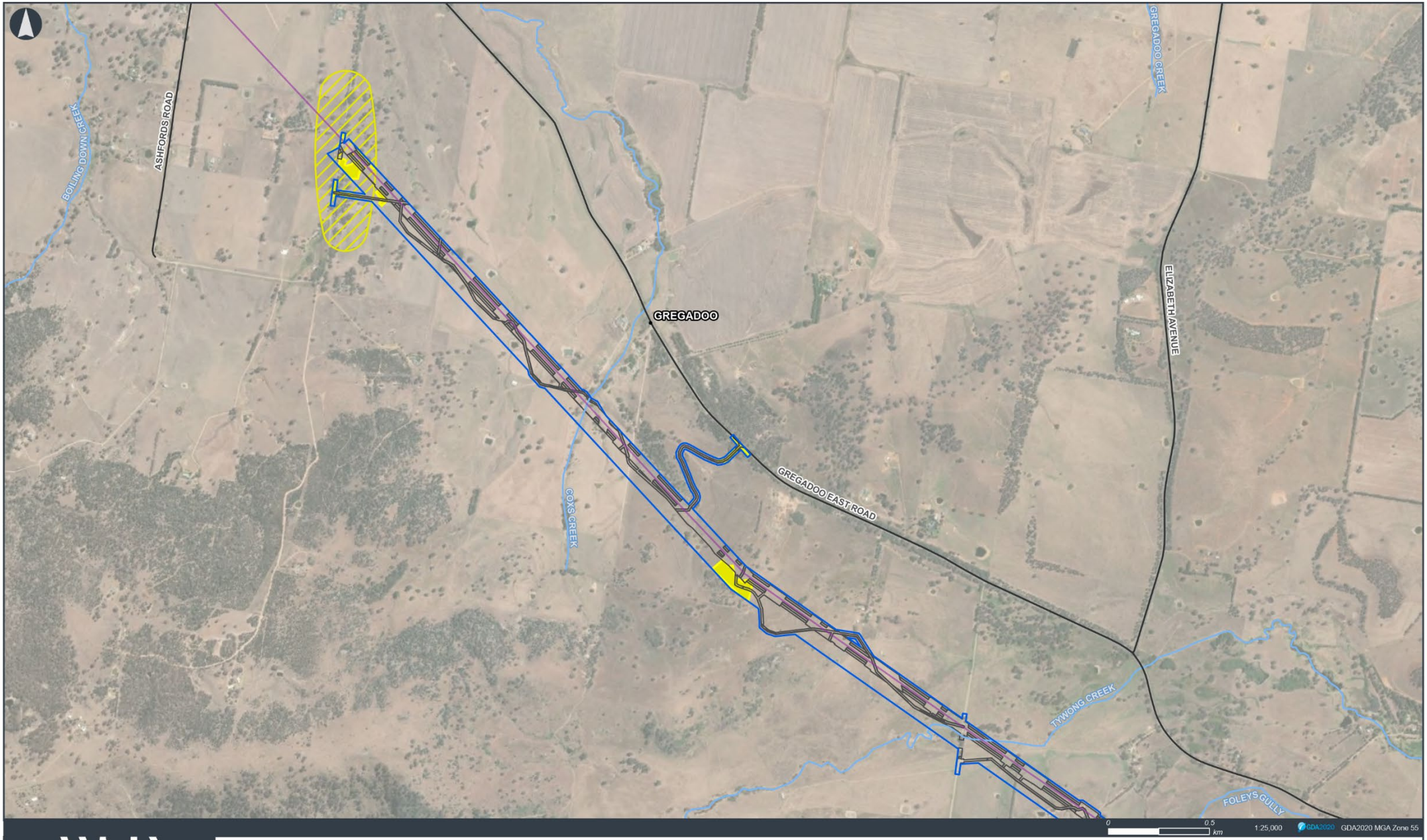
3.6.2 Network augmentation works component

The network augmentation works component is within the distribution of the Squirrel Glider, is surrounded by recent records, and a likely record was made immediately adjacent to the amended project footprint during targeted nocturnal bird surveys in December 2025. There is sufficient suitable and well-connected habitat within and outside the amended project footprint that it is expected to support the species.

As such, a Squirrel Glider species polygon has been prepared based on the area where suitable hollow bearing trees are present and with suitably sized hollows and connectivity. The plant community types with suitable hollow bearing trees to support Squirrel Gliders include:

- 0.39 hectares of PCT 277 – Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion in moderate-good and thinned condition
- 0.25 hectares of PCT 319 – Tumbledown Red Gum – White Cypress Pine hill woodland in the southern part of the NSW South Western Slopes Bioregion in thinned condition
- 0.04 hectares of PCT 266 – White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion in moderate-good condition.

A total of 0.68 hectares of habitat for the species has been mapped within the network augmentation works component and the species polygon is shown in Figure 3.4. This figure also shows the 20-metre-wide connectivity corridors that are proposed to be established by Transgrid near transmission line structures that occur in woodland vegetation as part of the connectivity strategy for the revised BDAR. A study by Ball and Goldingay (2008) recorded a maximum glide distance of 25 metres, suggesting that the proposed 20-metre-wide connectivity corridors associated with the amended project should be functional for gliding species (such as Squirrel Gliders) if trees of suitable height are present, or for replacement with wooden poles where no suitable trees are present {Ball, 2008 #4077}.



VNI West – BDAR
Figure 3.4
Squirrel glider
(*Petaurus norfolcensis*) habitat
Page 1 of 2

Legend

- Main road
- Named waterway
- Existing transmission line
- Subject land
- Squirrel glider (*Petaurus norfolcensis*) endangered poplulation (Species Expert Report)
- Proposed Squirrel glider connectivity zone

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Data sources: NSW EPI, DELWP, WSP, EnergyConnect



VNI West – BDAR
Figure 3.4
Squirrel glider
(*Petaurus norfolcensis*) habitat
Page 2 of 2

Legend

- Main road
- Named waterway
- Existing transmission line
- Subject land
- Squirrel glider (*Petaurus norfolcensis*) endangered poplulation (Species Expert Report)
- Proposed Squirrel glider connectivity zone

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Data sources: NSW EPI, DELWP, WSP, EnergyConnect

4 Brush-tailed Phascogale

4.1 Geographic range and distribution

4.1.1 NSW/Victorian border to Dinawan substation component

There are seven records of Brush-tailed Phascogale within the Murray Fans IBRA subregion. Importantly, all records within the Murray Fans IBRA subregion are associated with major waterways, including the Murray River and Edward River (Figure 3.2).

There are no records of Brush-tailed Phascogale in the Murrumbidgee subregion, in which the majority of the amended project footprint is located.

There are no records of either species in woodland that isn't associated with major waterways in the vicinity of the NSW/Victorian border to Dinawan substation section of the amended project.

The Brush-tailed Phascogale occurs along the coast in NSW and on the inland slopes of the Great Dividing Range in NSW and Victoria (Figure 3.1). The closest record of a Brush-tailed Phascogale to the NSW/Victorian border to Dinawan substation section of the amended project is situated north of Burraboi along the Niemur River, 29.6 kilometres south of the amended project footprint, and was recorded in November 1994.

The NSW/Victorian border to Dinawan substation section of the amended project is outside the current known distribution of the Brush-tailed Phascogale.

4.1.2 Network augmentation works component

This section of the amended project footprint sits within the known geographic range of the Brush-tailed Phascogale (Figure 3.2). The nearest record approximately 88 kilometres from the amended project footprint and was recorded in October 2022. Within the Inland Slopes, all known records of Brush-tailed Phascogale occur within the southern end of this IBRA subregion.

4.2 Suitability of habitat structure for shelter and movement

4.2.1 NSW/Victorian border to Dinawan substation component

The primary feature of the structure of the habitat for Brush-tailed Phascogales is sufficient suitably sized tree hollows, with a minimum entrance size of 2.5 to five centimetres, for denning or nesting and raising young – lactating females show a preference for large tree cavities with small entrances (2.5 to four centimetres across) and construct nests with bark, feathers and fur (OEH 2021).

Almost all locations inspected within the amended project footprint contained numerous suitable hollows for Brush-tailed Phascogales and thus the habitat is structurally suitable for the species to occupy and persist in.

A second important consideration for Bush-tailed Phascogales is the presence of rough-barked trees which they prefer over smooth-barked trees for climbing and foraging under bark for invertebrates and small vertebrates. Black Box and Grey Box trees are rough-barked which facilitate climbing and foraging while River Red Gum trees are only rough-barked at the base, which are less suited for climbing and foraging by Brush-tailed Phascogales.

In summary, the extent and floristic composition of woodland habitat in the NSW/Victorian border to Dinawan substation section provides favourable structural habitat for the denning, foraging and climbing behaviours of the Brush-tailed Phascogale.

4.2.2 Network augmentation works component

The woodland habitat along this section contained sufficient hollow bearing trees to provide shelter and denning opportunities for Brush-tailed Phascogales and the box-dominated woodlands contained sufficient rough-barked eucalypts for their climbing and movement.

4.3 Suitability of habitat for feeding

4.3.1 NSW/Victorian border to Dinawan substation component

The Brush-tailed Phascogale feeds on invertebrates and vertebrates found under peeling bark and rotting branches and logs on the ground. Black Box is a rough-barked species, but it does not form peeling ribbons or large flakes that invertebrates and small vertebrates can shelter under. In addition, the single-species stands of Black Box would only provide limited seasonal availability of nectar and pollen. Therefore, the black box dominated woodlands are unlikely to provide sufficient food resources for Brush-tailed Phascogales.

The woodlands along the major waterways were dominated by River Red Gum, which graded into Grey Box and then Black Box with increasing distance from the waterway. These mixed-species woodlands would likely provide sufficient foraging resources for Brush-tailed Phascogales.

4.3.2 Network augmentation works component

The woodland habitat in this section provides suitable foraging resources for Brush-tailed Phascogales in the form of eucalypts with rough and peeling bark that supports invertebrates and small vertebrates. In addition, the floral resources provided by the eucalypts and acacia species provides additional resources for the species.

4.4 Patch sizes and connectivity

4.4.1 NSW/Victorian border to Dinawan substation component

There is no published data on the minimum sizes of habitat patches and extent of habitat connectivity required for the persistence of Brush-tailed Phascogales in the south-west of NSW. The home range size of Brush-tailed Phascogales in high quality woodland on fertile soils near Euroa Victoria was between 2.3 and 8.0 hectares for females and at least 20 hectares for a single male (van der Ree et al. 2001) compared to home ranges that were 50 to 100 hectares in areas of poorer-quality regrowth forest on rockier soils (Traill and Coates 1993, Soderquist 1995). Based on this data, the home range size for Brush-tailed Phascogales in low-quality habitat is up to approximately 100 hectares for individual animals, and therefore at least 500 hectares of connected woodland habitat is likely required to support multiple adjacent territories. Therefore, the only patches of woodland habitat likely able to support viable populations of Brush-tailed Phascogale are along the Murray and Edward rivers.

4.4.2 Network augmentation works component

The size of many of the patches of woodland are too small to support individual Brush-tailed Phascogales who are likely to have home ranges in the 50 to 100-hectare size range. In addition, the low levels of habitat connectivity in the area further limit the ability of Brush-tailed Phascogales to persist in the amended project footprint. Therefore, they are unlikely to persist in the vicinity of the network augmentation works component.

4.5 Field survey results

4.5.1 NSW/Victorian border to Dinawan substation component

Spotlighting and arboreal camera trapping was undertaken by WSP at various locations within the amended project footprint as part of general and targeted surveys for the Revised BDAR. The detailed methods are given in section 2 of this report and in section 2.5.3 of the Revised BDAR and the results are given in section 5.3 of the Revised BDAR.

The most frequently detected arboreal marsupials were the Common Brushtail Possum and Krefft's Gliders.

No Brush-tailed Phascogales were detected during these surveys.

Additional habitat suitability assessments were undertaken in early February 2025 and are discussed in more detail in section 2.2 of this report.

4.5.2 Network augmentation works component

No targeted surveys or general fauna surveys that may incidentally detect Brush-tailed Phascogale were undertaken in this section of the amended project footprint. An assessment to determine the presence of hollow bearing trees and habitat suitability was undertaken in February 2025 and these results have been collated for the species polygon.

4.6 Conclusion

4.6.1 NSW/Victorian border to Dinawan substation component

The only woodland that has the potential to support Brush-tailed Phascogales in the vicinity of the NSW/Victorian border to the Dinawan substation section is the River Red Gum/Grey Box/Black Box woodland (refer to River Red Gum/ Grey Box/Black Box dominant PCTs listed in Appendix A) along the major waterways (i.e. Murray River and Edward River). However, the amended project footprint is well outside the current known distribution of Brush-tailed Phascogale and this expert report concludes that there are no Brush-tailed Phascogales within the amended project footprint or within the vicinity and therefore an associated species polygon has not been created.

4.6.2 Network augmentation works component

While the woodland habitat in the vicinity of this section of the amended project is suitable for Brush-tailed Phascogales, the extent of habitat loss, low levels of ecological connectivity and lack of any records within 65 kilometres of the amended project footprint renders the area unsuitable for the species and therefore an associated species polygon has not been created.

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Appendix A

Associated PCTs in the amended project footprint

PCTs associated with Squirrel Glider habitat are identified in Table A.1.

Table A.1 Associated PCTs within the amended project footprint

Species	IBRA region	IBRA subregions	Vegetation formation	PCT
Squirrel Glider	Riverina and NSW South Western Slopes	Murray Fans	Inland Riverine Forests	2 – River Red Gum-sedge dominated very tall open forest in frequently flooded forest wetland along major rivers and floodplains in south
		Murray Fans		7 – River Red Gum – Warrego Grass – herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion
		Murray Fans		10 – River Red Gum – Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		Murray Fans		11 – River Red Gum – Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion)
		Murray Fans Murrumbidgee	Inland Floodplain Woodlands	13 – Black Box – Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		Inland Slopes	Floodplain Transition Woodlands	70 – White Cypress Pine woodland on sandy loams in central NSW wheatbelt
		Murray Fans		237 – Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone
		Inland Slopes	Grassy Woodlands	76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
		Inland Slopes		266 – White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
		Inland Slopes		277 – Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
		Inland Slopes	Inland Rocky Hill Woodlands	319 – Tumbledown Red Gum – White Cypress Pine hill woodland in the southern part of the NSW South Western Slopes Bioregion
		Inland Slopes	Dry Sclerophyll Forests (Shrubby sub-formation)	343 – Mugga Ironbark – Red Box – Red Stringybark – Western Grey Box grass/shrub woodland on metamorphic substrates in the Tarcutta – Gundagai region, NSW South Western Slopes Bioregion

Species	IBRA region	IBRA subregions	Vegetation formation	PCT
Brush-tailed Phascogale	Riverina NSW South Western Slopes	Murray Fans	Inland Riverine Forests	7 – River Red Gum – Warrego Grass – herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion
		Murray Fans	Floodplain Transition Woodlands	237 – Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone
		Inland Slopes	Grassy Woodlands	76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
		Inland Slopes		266 – White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
		Inland Slopes		277 – Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
		Inland Slopes	Dry Sclerophyll Forests (Shrubby sub-formation)	343 – Mugga Ironbark – Red Box – Red Stringybark – Western Grey Box grass/shrub woodland on metamorphic substrates in the Tarcutta – Gundagai region, NSW South Western Slopes Bioregion

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June 2024

HumeLink Project– Golden Sun Moth Expert Report

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Contents

Attachment 14: Golden Sun Moth Expert Report 1
1. Expert report - Alison Rowell, Biologist and Environmental Consultant. 3
2. Golden Sun Moth (*Synemon plana*) 4
2.1 Conservation status 4
2.2 Description and biology 5
3. GSM in the HumeLink amended project area 7
4. Expert report approach 8
5. Habitat assessment methods 9
5.1 Niche and subconsultant field data collected 2021 to 2023 9
5.2 Data assessment in 2022 and 2023 10
5.3 GSM Habitat Transects 11
5.3 GSM habitat transects 11
5.4 GSM habitat quality classification (adapted from SMEC 2019) 12
5.4 GSM habitat quality classification (adapted from SMEC, 2019) 12
5.5 General characteristics of biomass classes (adapted from SMEC 2019) 13
5.5 General characteristics of biomass classes (adapted from SMEC, 2019) 13
5.6 Positive filter features 14
5.6 Positive filter features 14
5.7 Negative filter features 15
5.7 Negative filter features 15
6. Results 16
6.1 Seasonal conditions and variation 16
6.2 GSM habitat in the HumeLink amended project footprint 16
Table 1. Area of potential GSM habitat affected by the amended project 17
7. Potential Impacts 18
7.1 Potential direct impacts 18
7.2 Potential indirect impacts 19
7.3 Potential additional (prescribed) biodiversity impacts on areas of habitat connectivity 19
8. Avoiding and minimising impacts 20
9. Conclusion 21
Table 2. References used in this project. 22

Official

1. Expert report - Alison Rowell, Biologist and Environmental Consultant.

Alison Rowell has worked as a consultant since 1992, specialising in threatened species in woodlands and grasslands in south-east NSW and the ACT, and has become technically adept in assessments of the Golden Sun Moth (*Synemon plana*) and its habitat throughout this period.

She has carried out many surveys of the Golden Sun Moth (GSM) and its habitat, assessing the size and significance of populations and the extent and quality of habitat, and developing site management plans.

Methods used include walked transect and fixed-point surveys for flying males, retrieval of larvae, pupal case surveys, mark-release-recapture surveys, and broad and fine-scale habitat measurement and mapping. Sites assessed vary from very small to greater than 100 hectares, and include highway and light rail projects, privately owned and government sites, and solar and wind farms.

Alison Rowell has written policy documents and guidelines for Australian Capital Territory (ACT) government (including the ACT GSM Action Plan), Environmental Management Plans for GSM Offset sites and has contributed to GSM population biology research with others.

Between 2013 and 2023 Alison initiated and has co-ordinated a data-sharing project that allows all interested surveyors in ACT and NSW to share their survey data during each GSM flying season.

2. Golden Sun Moth (*Synemon plana*)

2.1 Conservation status

The Golden Sun Moth (GSM) was listed as critically endangered under the EPBC Act in 2002, then relisted to vulnerable in 2021. The relisting followed a review of its status, which found a significant increase in the last 20 years in its known extent of occurrence, area of occupancy and number of subpopulations (DAWE 2021). The species is now listed as vulnerable in New South Wales (NSW) and Victoria (2022) and the ACT (2023).

No Commonwealth recovery plan was prepared for the GSM while it was listed as critically endangered, and when relisted as vulnerable it was recommended that there not be a recovery plan for the species.

The *Matters of National Environmental Significance significant impact guidelines 1.1* are therefore the relevant significant impact guidelines for the GSM (DoE 2013). The guidelines state that habitat critical to the survival of a species refers to areas that are necessary for activities such as foraging, breeding, roosting, or dispersal; for the long-term maintenance of the species; to maintain genetic diversity and long-term evolutionary development; or for the reintroduction of populations or recovery of the species.

Habitat critical to the survival of the Golden Sun Moth has yet to be identified but is likely to include all native grassland and open grassy woodland habitat occupied by the species. Due to its specialised habitat requirements and fragmented distribution, all occupied habitat is important for the breeding activity of subpopulations and the recovery of the species.

Large subpopulations or small well-connected subpopulations in high quality habitat would have higher ecological importance than small, discrete populations. High quality habitat would be made up of medium to large sites containing a grassy native ground layer with abundant larval food species, with low weed cover, inter-tussock spaces, and land management consistent with maintaining GSM habitat value. Sites near the limit of the species range, or a long distance from other known subpopulations are also likely to be important in conserving the full range of genetic diversity. Survey effort in southern NSW is still considered to be insufficient, mainly because the majority of habitat occurs on private land, therefore the true extent of their range and distribution within it is unconfirmed.

Official

2.2 Description and biology

Unless otherwise stated, the information on the species in the sections below is drawn from the ACT GSM Action Plan (ACT Government 2017), the recent conservation advice (DAWE 2021), the NSW threatened species profile Golden Sun Moth - South Eastern Highlands: Distribution and vegetation associations | NSW Environment, Energy and Science, a recent literature review (TREC 2022) and the personal experience of Alison Rowell.

The Golden Sun Moth (*Synemon plana* Walker 1854), is a medium-sized day-flying moth in the family Castniidae. Adult GSM have clubbed antennae (like butterflies) and no functional mouthparts, with the adults only living 1-2 days after emergence. Males and females differ in appearance and behaviour. The wingspan is 34 mm in males and 31 mm in females, and the abdomen of the female extends beyond the wings at rest. Males can fly for extended periods and distances, while the heavier females mainly walk or flutter short distances. Males are grey below and females are white. The upperside of the forewing is dark with pale grey patterning in both sexes, while in the male the hindwing is bronze and in females is bright yellow orange with black marginal spots.

GSM larvae develop underground where they are associated with the roots of a few species of grasses, mainly Wallaby grasses (*Rytidosperma* spp.), and to a lesser extent Speargrasses (*Austrostipa* spp.). Larvae are cream-coloured and late instars have a red-brown head capsule. The larvae pupate after developing for 1-2 years underground, and adults emerge on warm dry sunny days in spring and early summer, leaving the upper half of the empty red-brown pupal cases protruding from the soil near tussock bases.

In ACT/NSW populations, the flying period is usually between mid-October and early January, with a peak from mid-November to early December. The most reliable method of detecting GSM is searching for the males, which fly continuously during the warmest part of the day in search of females. The start and end dates of the flying season vary with rainfall and overnight temperatures, and numbers of adults recorded at a site during a season also varies greatly from year to year based on data compiled by A. Rowell from and for ACT and NSW government staff, researchers and consultants (ACT Government, 2015; Richter et al., 2013; Rowell & Evans, 2014; Rowell, 2019; Rowell, 2023; Zenviron, Tilt & Umwelt, 2022).

GSM was originally widespread in south-eastern Australia in native grasslands and open woodlands with a high component of Wallaby grasses. Moderate to high cover of the larval food plants is desirable due to the low mobility and short life span of the female, which walks or flutters between tussocks to lay eggs, and because larvae are likely to be able to move only a limited distance through soil if unable to complete their development on the roots of a single tussock.

The species may be locally extinct across much of its range, though recent discoveries of small scattered populations in modified landscapes in Victoria and NSW suggest that many small populations are yet to be found or rediscovered.

Most of the ACT/NSW populations lie within a band about 130 km long and 40 km wide, running from the Queanbeyan to Boorowa districts, and most known sites are small and/or fragmented. Five major genetic clusters have been identified across ACT, NSW and Victoria, and genetic variation increases with the geographic distance between populations.

Official

Relatively dry and open grassland within the Natural Temperate Grassland of the South Eastern Highlands community, which is listed as critically endangered under the EPBC Act, is thought to be the species' original preferred habitat. However, many such areas supporting this community have been destroyed or degraded since European settlement.

Grasslands which have not been ploughed, heavily grazed or pasture-improved tend to retain cryptogams, bare ground and native forbs. They usually contain fewer exotic species and have lower and more stable biomass. They also retain the shorter species of Wallaby Grasses (*R. carphoides, R. auriculatum, R. laeve*), while more disturbed grasslands often contain more robust 'native pasture' species such as *R. caespitosum* and *Austrostipa bigeniculata* (SMEC, 2018). Small tussocks provide shelter and sites for larval development, and inter-tussock spaces are used for basking and for females to display and attract mates.

GSM are now found in native grassland, native pasture, open woodlands with a grassy understorey and secondary grasslands. It is likely that populations have spread into secondary grasslands after partial or complete clearing of trees, but these habitats usually support fewer moths than primary grassland. GSM also occurs in former dry forest communities where these were close to native grasslands and open woodlands. The density of Wallaby Grasses in secondary or disturbed grassland tends to vary considerably at a small scale, with patches of high density scattered across sites.

GSM larvae have also been found among the roots of two introduced grasses, Chilean Needlegrass and Serrated Tussock. These grasses are however usually associated with disturbance and other weeds, and often develop high biomass if not grazed.

Official

3. GSM in the HumeLink amended project area

The amended project occurs within two Interim Biogeographic Regionalisation of Australia (IBRA) regions known to contain GSM:

- South-Eastern Highlands region: Murrumbateman subregion
- NSW South-Western Slopes region: Inland Slopes subregion

The distribution of GSM records in NSW is shown in Figure 1. There are several records of GSM from November 2020 around the Rye Park Substation (presumably found during preliminary surveys for that facility), and one of these in within the amended project footprint (Day's Road, BY130-19).

Most records are in the Yass Valley and northern ACT, with a single isolated older record near Tumut (Gocup). This is 70 km west of the most westerly record in the main Yass Valley cluster and 3 km from the amended project footprint.

The concentration of records in the northern part of the ACT reflects different land use practices there in the past (with less pasture improvement), the inclusion of large areas of GSM habitat in well-studied reserves and on Commonwealth government land, and awareness of many small sites in parks and on road verges and median strips.

In the two IBRA subregions, GSM is associated with several vegetation formations including grasslands, grassy woodlands and dry sclerophyll forests, or grassy communities derived from these by clearing of trees. Many Plant Community Types (PCTs) within those formations have been identified as potential GSM habitat (BioNet and GSM threatened species profile on Office of Environment and Heritage (OEH) website).

Figure 2 shows that there is little overlap between GSM records and areas where White Box *Eucalyptus albens* is one of the dominant woodland eucalypts, as occurs in the Inland Slopes subregion.

The PCTs listed by OEH as being associated with the Inland Slopes subregion probably refer to the western sites of the northern half of the cluster of populations around Boorowa-Bowning (north of the amended project footprint) rather than the outlying Tumut site. The Tumut site is only 3 km inside the Inland Slopes subregion and was not visited.

This report assesses the amended project footprint, the area within which direct impacts could occur from the amended project. The amended project footprint includes an updated indicative disturbance area, which is an estimated area to be directly disturbed during construction and operation of the amended project including proposed transmission line and associated infrastructure. However, the updated indicative disturbance area may be altered during detailed design to further avoid and minimise biodiversity impacts or for other reasons. Biodiversity assessment activities (e.g. vegetation and habitat assessment) have been conducted throughout accessible areas of the amended project footprint with certain targeted survey activities occurring within the updated indicative disturbance area, which is the area used for all clearing and impact calculations.

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4. Expert report approach

Broad GSM habitat polygons were to be delineated using vegetation community (PCT) mapping and floristic and condition score data previously collected from BAM plots in potentially suitable GSM habitat in the amended project footprint. These data would then be reviewed against data from 100 metre point intercept GSM habitat assessment transects from areas provisionally identified as suitable or unsuitable habitat based on proximity to known GSM sites and the vegetation community present.

Alison Rowell visited a subset of the above sites across the amended project footprint in the Murrumbateman and Inland Slopes IBRA subregions in November-December 2022 and 2023 to undertake field evaluation of the above data.

Two GSM sites previously identified by Clarke and Whyte (2003) were visited to assess their current condition and to estimate how typical they were of habitat in their vicinity.

A set of parameters indicating the potential for habitat to support Golden Sun Moth populations was then developed based on the collected data, GSM literature and Alison Rowell's knowledge.

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5. Habitat assessment methods

The GSM habitat assessment incorporated best practice survey methods and habitat quality classification parameters to inform the creation of GSM habitat polygons identifying potential habitat within the updated indicative disturbance area. Relevant databases and scientific literature (Table 2) were reviewed prior to undertaking the field survey to identify data gaps and inform survey design.

5.1 Niche and subconsultant field data collected 2021 to 2023

The initial delineation of potential habitat used the vegetation community (PCT) mapping to locate PCTs known to be associated with GSM in the Murrumbateman and Inland Slopes IBRA subregions (BioNet and DPE threatened species online profile 2023) and related these to previous GSM records from the NSW BioNet Atlas Database. This was followed by measurement of GSM habitat transects and visual surveys for flying GSM in potential habitat. Site photographs were taken in most cases and provided to Niche for review.

GSM habitat assessment coverage throughout the Murrumbateman IBRA subregion section of the amended project footprint was good, with 89 habitat transects assessed. The majority of known GSM records relevant to the amended project occur within this region and these habitats are therefore considered to have the highest potential for supporting GSM.

Within the Inland Slopes IBRA subregion, 58 GSM habitat assessments were undertaken. There were more restrictions to private property access in this section, but parts of this region within the amended project footprint (predominantly the south-western section) do not coincide with the known range of GSM.

The only known GSM record close to where the HumeLink amended project footprint passes through the Inland Slopes subregion is a single site 3 km south of the footprint near Tumut. This population is 70 km west of the cluster of populations in the Murrumbateman subregion and has been identified as genetically distinct from these, with no intermediate populations having been found 'within a 70 km radius despite extensive searching over a number of years' (Clarke & Whyte, 2003). The population near Tumut appears more closely related to Victorian populations than to the ACT/Yass/Murrumbateman cluster, which also suggests that there are unlikely to be stepping-stone populations between the Tumut site and the nearest Murrumbateman cluster (or they would probably share more genes). It is therefore thought to be unlikely that the amended project footprint would intersect with any stepping-stone populations within the Inland Slopes IBRA subregion.

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5.2 Data assessment in 2022 and 2023

In November-December 2022, Alison Rowell accompanied Arne Bishop of Ecoresolve to inspect a selection of sites in the Inland Slopes and Murrumbateman IBRA subregions that had received positive and negative assessments for GSM habitat suitability, supplementing field surveys conducted the year prior. This process was repeated in December 2023 with Shannon Baker of Niche, and some additional GSM habitat transects were measured. Additional areas were assessed in 2023 due to changes in the amended project footprint and some access tracks.

Photographs were taken to illustrate vegetation condition, and plant species lists were made to check against previous data collected, with an emphasis on recording species and conditions both positively and negatively associated with GSM habitat. Notes were made on patch size and connectivity, and site characteristics such as slope, aspect, rocks, pasture improvement, drainage, weediness, site management, rockiness and other signs of recent and past disturbance.

The method used for assessing GSM habitat presence and quality in the field was based on that used in the northern ACT and developed by Alison in conjunction with SMEC for ACT government (SMEC, 2018a; SMEC, 2019) (below refer to Section 5.3 – 5.7). The SMEC (2019) habitat condition classes were adapted to accommodate the conditions of the current project, as that classification did not allow for survey in grassy areas cleared from open forest communities, or the temporary biomass, weed and litter loads that were present in 2021-23 after three years of a La Nina weather system. Similarities in vegetation composition, structure and condition to nearby GSM sites where Alison has worked were noted. This includes Bango wind farm, Springdale solar farm, the Barton Highway duplication in NSW, and many areas across the northern ACT.

In consultation with Chani Wheeler of Niche, a series of filters for GSM attributes was developed to be applied to the data to refine the definition of potential GSM habitat in the amended project footprint.

After the site visits, the data was reviewed in GIS along with previously collected GSM data. As genera and functional plant/habitat attributes (rather than plant species) were recorded in the GSM habitat transects, it was necessary to review the nearest BAM plots and photographs to determine which actual species may have occurred on the GSM habitat transects, and to examine site photographs for further information on habitat condition.

PCTs present in the amended project footprint that were considered to be associated with this species include PCT 266, 277, 352 and 1330. In addition to the known primary PCT habitat associations of grasslands and open grassy woodlands, the following PCTs were also considered to provide suitable habitat opportunities for GSM in some locations within Murrumbateman: PCT 1093, 351, and 287. These are open forest vegetation types containing Red Stringybark and/or Brittle Gum, and the potential GSM habitat occurred in openings in the forest/woodland or where the trees had been cleared. Some of these open forest vegetation types are listed on the OEH GSM profile as having potential as habitat and GSM have been recorded in them during other projects in the Murrumbateman subregion and in the northern part of the ACT.

Some sites that were considered to be potential GSM habitat have been assessed based on their proximity to known GSM sites and the presence of suitable larval food grasses at the site (or in nearby BAM plots) rather than being strictly confined to the PCTs listed as being associated with GSM.

After potential GSM habitat in the amended project footprint was identified in this way, further analysis was undertaken on data at the subsite level, reviewing more plot and transect data, photographs from GSM and other threatened species surveys, and Google Earth imagery from

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different years to identify habitat attributes and likely disturbances such as tree regeneration and planting, flooding, ploughing and pasture improvement.

A conservative approach to delineating potential GSM habitats was adopted in areas where data was deficient. In these locations, potential habitats were considered suitable for the species where they supported a known PCT association, intersected the known range of the species, and aerial photo examination did not suggest the presence of dense woody vegetation or wetlands. GSM are known to occupy exotic grasslands containing Chilean Needlegrass, but exotic grasslands were excluded from consideration given the general lack of Chilean Needlegrass observations within the amended project footprint (based on the review of available plot and habitat assessment data and field inspections).

The methods used to collect data and the way the assessment was undertaken are described in the text boxes below.

5.3 GSM habitat transects

Niche and subconsultants undertook 147 100 m step-point transects in areas of potential Golden Sun Moth habitat. A dominant habitat feature was recorded at each 1 m interval of the transect, from the following list:

- Bare earth/soils
- Cryptogams
- Litter/dead vegetation
- Perennial native grass – Other
- Perennial native grass – *Austrostipa* spp.
- Perennial native grass – *Rytidosperma* spp.
- Other native grass (non-Golden Sun Moth food)
- Exotic Golden Sun Moth food plants – Other
- Exotic Golden Sun Moth food plants – Chilean Needle Grass
- Exotic Golden Sun Moth food plants – Serrated Tussock
- Perennial exotic grass (non-Golden Sun Moth food)
- Annual exotic grass
- Exotic forbs.

The list above does not record native forbs (good indicators of the amount of past disturbance), and there is a possible duplication of categories with 'perennial native grass – other' and 'other native grass (non-Golden Sun Moth food)'.

The lack of species identification in the larval food plant categories means that the presence of large tussock grasses in the same genera as food plants (but not known to be used by GSM larvae) can affect the determination of habitat suitability. These include *Austrostipa densiflora* and *Rytidosperma pallidum* (both associated with open forest more than primary grasslands or woodlands). Species lists from nearby BAM plots and photographs from plots and transects were used to identify these species and to therefore remove some sites from the GSM potential habitat list.

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5.4 GSM habitat quality classification (adapted from SMEC, 2019)

High-quality habitat (none seen in amended project footprint)

Primary Natural Temperate Grasslands (NTG) or native pasture dominated by native larval food plants i.e. smaller *Rytidosperma* spp. and/or *Austrostipa* spp.), with low weed cover and some bare ground. Most (but not necessarily all) of the following minimum values should be met:

- 10% cover *Rytidosperma* spp. or 15% cover *Rytidosperma* spp. and *Austrostipa* spp. combined
- >5% bare ground
- < 5% exotic broadleaf
- Low to moderate biomass
- Litter sparse to moderate (<25% cover of litter)
- Moderate to high native plant diversity (>12 native species per 20m x 20m area)

Moderate-quality habitat

Primary (none identified in amended project footprint) or secondary grassland, with a moderate component of smaller *Rytidosperma* spp. and/or *Austrostipa* spp., and/or moderate weed cover. Most (but not necessarily all) of the following minimum values should be met:

- 5% cover *Rytidosperma* spp. or 10% cover *Rytidosperma* spp. and/or *Austrostipa* spp. combined
- 3% bare ground
- < 10% exotic broadleaf
- Low to moderate biomass
- Litter sparse to moderate (<25% cover of litter)
- Moderate native plant diversity (>8 native species per 20m x 20m area)

Low-quality habitat

Larval food plants (*Rytidosperma* spp., *Austrostipa* spp. and/or Chilean Needlegrass) are a minor component of the ground layer, growing sparsely or in patches among unsuitable vegetation (i.e. not larval food species), and other minimum values are met:

- *Rytidosperma* spp. present
- 10% cover *Rytidosperma* spp. and/or *Austrostipa* spp. combined
- < 20% broadleaf

Chilean Needlegrass (CNG) dominated habitat (none seen in amended project footprint)

Grassland dominated by Chilean needle grass.

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5.5 General characteristics of biomass classes (adapted from SMEC, 2019)

For all GSM habitat condition classes, the ideal biomass condition is low to medium, i.e. most areas without dense thatch or tall dense tussock grasses over 10 cm high.

Sites were not excluded due to higher than desirable biomass or weed cover if this was assessed to be a temporary condition associated with the recent La Nina seasons.

Very low biomass

- Tussocks up to 5 cm high
- bare ground very common between tussocks
- litter layer sparse/absent
- average grass sward height less than 4 cm

Low biomass

- Tussocks up to 10 cm high
- bare ground common between tussocks
- litter layer sparse
- average grass sward height 4 to 8 cm

Medium biomass

- Tussocks up to 20 cm high
- little bare ground between tussocks
- litter common but not continuous
- average grass sward height 8 - 12 cm

High biomass

- Tussocks greater than 20 cm high and closely spaced
- little or no bare ground
- litter layer continuous and thatched, may include subterranean clover
- average sward height greater than 12 cm

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5.6 Positive filter features

Filter features **positively** associated with GSM habitat include larger patches of native grassland containing larval food species, preferably connected to other similar patches. These include:

- Areas cleared from Yellow Box-Red Gum grassy woodlands and similar vegetation types, with some or more of the following understorey characteristics:
-
    - Low biomass +/- patches of bare ground
        - Related to soil conditions or regular grazing
        - May include small patches around rock outcrops, beside tracks, on compacted soil near dams or gates and on old tracks, may be surrounded by other native grasses or exotic pasture.
    - High cover of native grasses
    - Moderate to high cover of Wallaby Grasses, especially smaller species such as *Rytidosperma carphoides, R. auriculatum, R. laeve*
        - Smaller species can be overtopped or disappear with pasture improvement or under-grazing
    - Rough or Tall Speargrass (*Austrostipa scabra, A. bigeniculata*), Redleg Grass, Nine-awn Grass
    - Cryptogams
        - Indicates available bare ground, low disturbance, little or no pasture improvement
    - Small intertussock forbs such as *Lomandra bracteata*, *Chamaesyce drummondii, Triptilodiscus pygmaeus, Vittadinia muelleri, Solenogyne dominii, Cymbonotus lawsonianus, Crassula sieberiana, Chrysocephalum apiculatum, Enneapogon nigricans, Convolvulus angustissimus, Plantago varia, Wahlenbergia communis/luteola/gracilis*
        - Indicates intertussock spaces, low past disturbance, long-term maintenance of low to medium biomass, little or no pasture improvement.
- Areas cleared from grassy open forest communities containing Red Stringybark and/or Brittle Gum, Scribbly Gum, Long-leaved Box, Apple Box etc, with some understorey characteristics as above.

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5.7 Negative filter features

Filter features **negatively** associated with GSM habitat include grassy areas:

- Dominated by non-food grass species such as *Microlaena stipoides* and *Themeda triandra*, both of which may be associated with more moisture, higher biomass, southerly aspect, deeper soils, less stock grazing.
- Cleared from open forest habitats wetter than above or containing a significant shrub component, especially *Leptospermum, Kunzea, Bursaria, Cassinia*.
- Cleared from forest or woodland but with dense eucalypt regeneration.
- Cleared from forest and containing large unsuitable tussocks such as *Austrostipa densiflora* and *Rytidosperma pallidum.*
- Poorly-drained sites and/or supporting semi-wetland vegetation such as many rushes and sedges, *Carex appressa*, *Rytidosperma duttonianum, Haloragis heterophylla, Lythrum hyssopifolium, Mentha diemenica, Drosera, Pratia, Isotoma, Luzula, Stylidium, Poa labillardierei*, *Paspalum dilatatum*.
- Steep or south-facing slopes
- High biomass/improved pasture sites with GSM food plants scattered sparsely among exotic grasses rather than in discrete patches, especially with *Phalaris, Lolium, Dactylis, Trifolium subterraneum, Avena* spp. - these species lead to high biomass and dense thatch after vegetation collapse.
- Site with tall weeds or affected by previous weed control, soil disturbance/ploughing, sheet erosion.

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6. Results

6.1 Seasonal conditions and variation

Analysis of shared GSM survey data for the ACT and NSW between 2019 and 2023 showed great variation in numbers of GSM observed during flying seasons. 2019 was hot and dry and the season started and finished early, but high numbers of GSM were recorded. Many 2019 surveys recorded over 100 males, with thousands counted at some sites, and over 100 females were observed.

Numbers were lower in the following years, which were wetter and cooler with fewer suitable flying days, and most sites also had increased biomass. In 2021 the highest count of males at any site was 15 and no females were recorded. In that year, shared data from 112 site visits across the known ACT/NSW distribution area showed that very low numbers of adults emerged, including in several well-surveyed reference populations. In 2022 and 2023 few surveys found more than 10 males and numbers of females were again relatively low.

Many factors are likely to affect numbers of adults observed in a season. As the length of the larval period is probably mostly two years, the number of adults emerging reflects the success of the breeding event two years prior to the survey season, mortality of the larvae developing underground over that period, and the weather conditions at the time of emergence of adults.

Most of the surveys for flying adults in the HumeLink easement were undertaken in 2021 and no GSM were observed in areas of potential habitat, but this should not be taken as evidence of absence due to the very poor season across the whole district. Some of the surveys took place before flying had been confirmed in the district, and others were on days of unsuitable weather. Three days of surveys in December 2021 around Yass and Murrumbateman for a different project also found no GSM at several sites that had substantial cover of food plants (Capital Ecology, shared data, 2021).

6.2 GSM habitat in the HumeLink amended project footprint

Classification of the collated field data resulted in the identification of numerous potential GSM habitat polygons in the Murrumbateman and Inland Slopes IBRA subregions, comprising a total area of 285.53 hectares (shown in Figure 3). The site of known records near the Rye Park Substation (BY130-19) was visited in late November 2023, but the weather was cold and wet, unsuitable for GSM flying.

Some areas of potential habitat were excluded using the negative filter features identified in Section 5.7 above. The eastern boundary of the area considered was the Lachlan River, 17 km east of the nearest known GSM record. It was considered unlikely that GSM would occur west of where the footprint crossed the Murrumbidgee River, 15 km south-west of the westernmost Yass Valley record, but potential habitat west of the Murrumbidgee was considered due to the outlying record near Tumut.

Within these polygons, the total predicted impact to GSM habitat within the updated indicative disturbance area as a result of construction and operation is 27.48 ha of potential habitat (9.84 ha in Inland Slopes and 17.64 ha in Murrumbateman subregion). The actual area affected is likely to be smaller, as habitat usually occurred as small, scattered patches. It is not possible to map all of these so whole paddocks identified as containing such patches were mapped as habitat.

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No high-quality habitat was identified, as no Natural Temperate Grassland occurred in the amended project footprint.

A few patches of moderate quality habitat were identified within the amended project footprint, e.g. Rye Park Road (BY128) near Dalton in the Murrumbateman subregion. Such sites contained secondary grassland with areas of high cover of low biomass Wallaby Grasses and patches of bare ground. Habitat in secondary grassland is vulnerable to degradation through tree regeneration.

Most of the GSM habitat fell into the low-quality category, or between low and moderate, due to degradation and fragmentation associated with grazing and pasture improvement which bring increases in biomass and exotic cover. Almost all of the GSM habitat identified from BAM and habitat transect data, site photographs and validation visits was in small patches scattered across sites and separated by areas of unsuitable land use, landform or vegetation. Such patches often remain suitable for GSM as biomass is kept low and pasture grasses are suppressed by factors such as proximity to rock outcrops, dam walls and gully edges which help to keep the soil drier.

Two GSM sites near the amended project footprint that were identified over twenty years ago (Clarke and Whyte 2003) were visited. Both were found to still contain some GSM habitat, and both differed markedly from the privately owned pasture-improved grazing land which surrounded them, so did not indicate an increased likelihood of GSM presence on nearby parts of the easement that resembled the grazed areas. The sites were Coolalie Travelling Stock Reserve on Coolalie Road about 3.5 km south of the amended project footprint, and a wide roadside reserve near the intersection of Blakney Creek Road south and Cook's Hill Road, about 1.8 km north of the easement. The scattered distribution of small moderate to low quality GSM habitat patches is typical of other grazed sites in the Murrumbateman subregion identified during surveys ahead of wind farms, solar farms and highway duplication (e.g. ERM 2013, NGH Environmental 2014, Niche 2018, NSW Government 2019).

It is likely that much of the landscape surrounding the amended project footprint is similar and would contain patches of potential GSM habitat in the same condition.

Table 1. Area of potential GSM habitat affected by the amended project

IBRA subregion	Disturbance category	Area (ha)
Inland Slopes	ECZ	0.22
Inland Slopes	HTZ	0.00
Inland Slopes	TCZ	9.62
Murrumbateman	ECZ	0.30
Murrumbateman	HTZ	0.01
Murrumbateman	TCZ	17.33
TOTAL		**27.48**

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7. Potential Impacts

7.1 Potential direct impacts

Total impacts to GSM habitat have been identified as 27.48 ha, with almost all of this assumed to be in the Total Clearing Zone (TCZ) (refer to Section 13.1 of the BDAR). This is a worst-case scenario, as some areas damaged during construction and wire raising may recover naturally or through rehabilitation as above, and actual GSM habitat is likely to occupy only a proportion of the polygons mapped as potential habitat.

The remaining loss is in the Easement Clearing Zones (ECZ) and possibly Hazard Tree Zones (HTZ). In these areas clearing and ongoing suppression of tall-growing vegetation will be undertaken under transmission lines, but soil disturbance (and hence ground layer vegetation removal) is generally not required. The eventual result from suppression of tree and shrub regeneration in these zones and along maintenance tracks may result in an increase in the area of grassland and potential GSM habitat beyond the existing areas. GSM often naturally occur along track edges, where soil conditions often favour smaller native tussock species. This effect could be enhanced by replanting of track verges and disturbed areas adjacent to existing GSM habitat as well as within patches, using small species of locally occurring Wallaby Grasses and Speargrasses.

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7.2 Potential indirect impacts

Indirect impacts to GSM habitat may include:

- Run-on of water and sediment to habitats as a result of changed hydrology causing changes in soil moisture, vegetation composition and biomass, and reducing habitat quality
- Introduction of weeds affecting habitat viability
- Trampling of grasses by machinery during construction.

These impacts can be mitigated by planning to minimise vehicle use inside habitat zones, use of sediment fencing, appropriate shaping of tracks and transmission line benches and post-construction rehabilitation/ revegetation.

7.3 Potential additional (prescribed) biodiversity impacts on areas of habitat connectivity

In modified pastoral landscapes, GSM habitat typically occurs as small patches of suitable native grasses among unsuitable vegetation such as exotic pasture, forest or areas of tree regeneration. GSM have poor powers of dispersal, with habitat patches more than 200 metres apart assumed to be effectively isolated. This is likely to be the existing case in much of the potential GSM habitat in the amended project footprint.

Clearing small patches of habitat may create breaks in connectivity within the amended project footprint and between the footprint and adjacent areas. This could be mitigated by revegetation/rehabilitation using small locally occurring species of Wallaby Grasses and Speargrasses within the footprint as described above, with the intention of creating connected corridors between patches.

The ongoing maintenance of ECZ and unsealed maintenance tracks also has the potential to create links between previously isolated GSM habitat patches. This could be enhanced by rehabilitation of track verges and disturbed areas with native grasses where they lie between areas of potential habitat, to create stepping-stone habitat for GSM to move within and outside the footprint.

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8. Avoiding and minimising impacts

Impacts on GSM habitat during construction will be avoided or minimised as outlined in the environmental mitigation measures component of the BDAR (Section 14). Mitigation measures include:

- Refined mapping of GSM habitat in impacted areas before construction. The mapping of GSM habitat has identified broad locations within the amended project footprint where scattered or continuous patches of suitable habitat occur or are likely to occur, and pre-construction mapping of impacted areas would show specific locations of habitat patches (refer to mitigation measure B1).
- Where possible, surveys for flying male GSM under suitable conditions in spring to confirm their presence on sites with the highest potential, to focus avoidance and mitigation efforts (refer to mitigation measure B4).
- Micrositing of transmission line infrastructure, associated work sites and other disturbances such as laydown areas to avoid native grassland/mapped GSM habitat where possible (refer to mitigation measure B1).
- Using existing tracks where possible and planning routes and activities within the construction zone to avoid mapped habitat (refer to EMM B28).
- Rehabilitation of habitat that is disturbed by construction with appropriate native grasses, without use of fertiliser or clover. Plantings should include C3 grasses that are GSM larval food plants such as grassland Wallaby Grasses (*Rytidosperma* spp.) and Speargrasses (*Austrostipa bigeniculata*), *A. scabra*, and a low biomass dryland C4 grass (Redleg Grass (*Bothriochloa macra*) (refer to mitigation measure B3, B9).
- Follow-up weed control of replanted areas as part of track and site maintenance (refer to mitigation measure B22, B23).

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9. Conclusion

Through the synthesis of a desktop review of the relevant literature and existing data, and the collation of the findings of GSM field surveys undertaken in 2021 to 2023, it was found that GSM has the potential to occur within the amended project footprint.

The only known GSM record within the amended project footprint is on Day's Road near the Rye Park Substation and no GSM were identified during field surveys, but many areas of potential habitat were identified within the amended project footprint.

The quality of this habitat, as determined by the parameters outlined in Sections 5.4-5.7, varied from low to moderate. Moderate quality GSM habitat was sparse and found only in secondary grassland with areas of high cover of low biomass Wallaby Grasses and patches of bare ground. Low quality GSM habitat accounted for most potential habitat identified and generally occurred in small, discrete patches subject to degradation and fragmentation as a result of grazing and pasture improvement.

GSM habitat polygon modelling found that amended project construction and operation is predicted to impact up to 27.48 ha of potential GSM habitat within the updated indicative disturbance area. As such, avoidance and mitigation measures tailored specifically to the GSM, as outlined in Section 8, will be employed to reduce the likelihood and extent of impacts to potential GSM habitat. Where impacts cannot be avoided, biodiversity offset requirements will be met if required.

Official

Table 2. References used in this project.

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Key's Matchstick Grasshopper (*Keyacris scurra*) Expert Report – HumeLink project

February 2024



Off

This report was prepared by:

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H. Yagui is completing her final year as a PhD candidate in School of BioSciences at The University of Melbourne. Her research focuses on ways to improve the conservation success of matchstick grasshoppers including *Keyacris scurra*. Under the guidance of Professors Michael Kearney and Ary Hoffmann, she has been researching the species since 2020. Throughout her studies, she has actively participated in nine field trips aimed at surveying the species, with a primary focus on investigating their plant food diet. Additionally, she has played an integral role in the maintenance of captive colonies in the laboratory.

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Supervised by:

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M. Kearney, is and ecology professor specializing in understanding environmental influences on species distributions and behaviour, has focused on matchstick grasshoppers since 2003, conducting over 60 field surveys on this group. Specifically, he has conducted ten surveys targeting *Keyacris scurra* since 2017. Collaborating with Prof. Ary Hoffman, Kearney led the first national resurvey of the species since the initial work conducted by Ken H. Key and Michael J. D. White. They rediscovered the species in Omeo, Victoria. Hoffmann and Kearney subsequently advocated for the species to be listed as threatened nationally. Together with Hoffmann, Kearney has conducted genetic and habitat assessments based on the species' current distribution. Additionally, he has provided expert input on this species for the DPIE threatened species review (2020) and the Orthoptera IUCN assessment session on bushfire effects (2021).

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Keyacris Matchstick Grasshopper (*Keyacris scurra*)

1.1. Description and biology

Key's Matchstick Grasshopper (KMGH) is distributed in native grasslands, savannah woodland country and between this and the sclerophyllous forests (White, 1956), mainly in vegetation associations of kangaroo grass (*Themeda triandra*) that provides shelter and daisies (mostly Asteraceae) as source of food (White, 1956). Despite occurring in localized areas, it can exhibit high densities, particularly in habitats with direct sunlight avoiding dense overstory.

It was once believed to have a wide presence across northeastern Victoria and eastern New South Wales, reaching as far north as Orange. However, due to intensified agricultural practices like regular livestock grazing and cropping, its habitat has significantly diminished since Michael White's observations in 1956. Presently, it is confined to small pockets of habitat within agricultural areas, such as rural cemeteries, reserves, and railway cuttings. Recent studies indicate a continued decline in its population (Hope and Law, 2000; Hoffmann et al., 2021).

Originally described as *Moraba scurra*, the species was later reclassified under the genus *Keyacris*. It belongs to the subfamily Morabinae, endemic to Australia, and specifically falls under the tribe Keyacridini. *K. scurra* is characterized by its small size (approximately 25 mm for females and 18 mm for males), slender body, wingless structure, slanted face, splayed hind femora, and ensiform antennae. It exhibits various colour forms, with brown and green being predominant. Notably, there are two parapatric chromosome races within the species, distinguishable only through genetic analysis. *K. scurra* shares resemblance with nymphs of *Acrida conica* (Giant Green Slantface) but can be differentiated by the absence of wing buds and the presence of a triangular gap between the head and thorax, a characteristic absent in *A. conica*.

They have only one generation per year and generations do not overlap (Rowell and Crawford, 1995). The eggs hatch in December and January and become adults in May (males) and spring (females) (White, 1956). Mating occurs as soon as the females reach adulthood, and lasts until the end of November (White, 1956). This characteristic makes them an important food source for other animals during winter. Beneficial flow on effects to food webs are connected to *K. scurra* populations establishment.

2.1 Conservation status

In November 2021, the NSW Threatened Species Scientific Committee, under the Biodiversity Conservation Act 2016, classified *Keyacris scurra* as Endangered (Hope and Law 2020). This classification was based on several factors: the species has a highly restricted distribution, occupying roughly 124 km2; its population and habitat are

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significantly fragmented; and there's a sustained decline in abundance, distribution, habitat quality, and the number of individuals (Hope and Law 2020). The classification is supported by extensive surveys conducted between 1950 and 1990 for chromosomal research, along with recent findings of local extinctions at previously recorded sites, providing clear evidence of the species' diminishing status (Hope and Law 2020).

Key's matchstick grasshopper is exposed to several threats, but the main reason for its population decline is habitat loss from mowing, burning, over-grazing, weed invasion, new burials (at cemetery sites), cultivation, pasture improvement, urban development, and lack of understanding on management requirements (Rowell and Crawford, 1995 in NSW Threatened Species Scientific Committee, 2019). Only remnants of suitable habitat for *K. scurra* are found in cemeteries or along railway easements, which have not been extensively affected by grazing. The habitat on active cemeteries struggles with localised excavation and stockpiling of material, but most of the species' historical sites are historic cemeteries (NSW Threatened Species Scientific Committee, 2019). Once described from near 30 cemeteries throughout its range near 70 years ago, the 2019 survey only found Key's Matchstick Grasshopper at 2 of the 25 cemeteries examined where it had formerly been recorded, and the grassland habitat in most cemeteries had been destroyed by mowing (Kearney & Hoffmann, 2019).

In the 1950s and 1960s, the cytogenetics of Key's matchstick grasshopper was extensively studied by Professor White, who argued that the species' distribution range was shrinking. In recent years, surveys confirmed that it no longer exists in many places where the species used to be found. The subsequent categorisation of the species as threatened opens the door to propose conservation actions for *K. scurra*, aiming to reintroduce this species to some sites in its former distribution range. Captive breeding of the species and subsequent release is feasible based on current experience with laboratory cultures. Reintroductions are also feasible because the species can survive in quite small areas as long as appropriate vegetation is present. If no action is taken, there is the risk that the remaining populations will continue to decline and be lost. Due to its low dispersal ability, *K. scurra* cannot migrate to suitable habitats like other species, so specific events such as fires, application of pesticides (including grasshopper-specific pesticides used to control the Australian Plague Locust) or mowing of required habitat can destroy an entire population (NSW Threatened Species Scientific Committee, 2019). There is also an opportunity to engage the public on the value of maintaining native habitat on which the grasshopper depends.

2.2. Habitat Description and KMGH Presence

The suitable habitat for *K. scurra* typically encompasses grassland and grassy woodland, characterized by Kangaroo Grass (*Themeda triandra*), that is not considered food plant, alongside areas with everlasting daisies (*Chrysocephalum apiculatum*), and Clustered Everlasting (*C. semipapposum*) (White 1956), and yellow buttons of the genus *Leptorhynchos* that provides food. Understanding the habitat preferences of the species is crucial for targeted survey efforts. Observing the presence of certain food plants or specific

habitat features can serve as strong indicators of the species' presence in an area. Other known food plants are species of the genus *Plantago* (natives and introduced) and *Acaena*.

Unfavourable habitat conditions encompass high levels of disturbance (e.g. mowed areas), absence of necessary resources (e.g. only Kangaroo grass but not food plants), or shadowy areas.

II. KMGH in the HumeLink project footprint

The project takes place in three Interim Biogeographic Regionalisation of Australia (IBRA) regions where Key's matchstick grasshopper is known to be present:1. South-Eastern Highlands region: Murrumbateman subregion; 2. NSW South-Western Slopes region: Inland Slopes subregion; and 3. Australian Alps region: Snowy mountains subregion.

The distribution of the species in NSW recorded on the BioNet Atlas Database and the incidental record reported on the project area is shown in Figure 1.

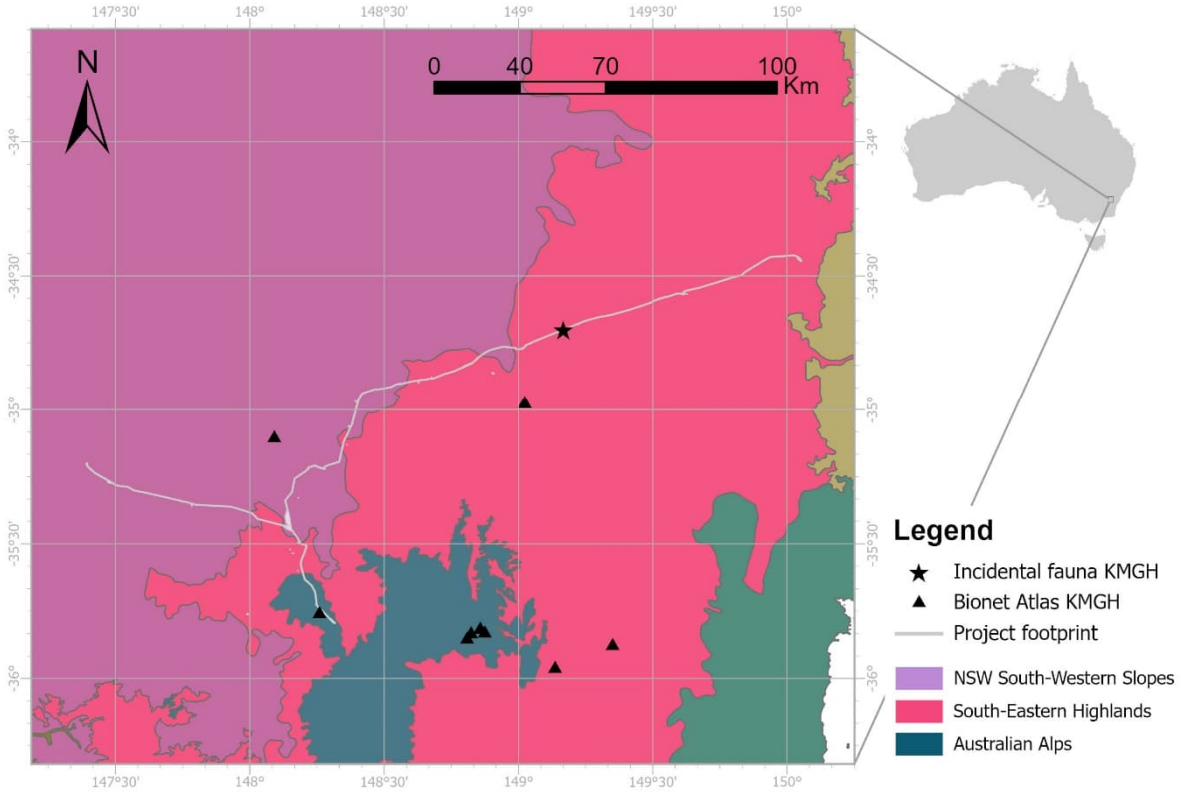


Figure 1 KMGH distribution in the project area (Source: NSW BioNet Atlas Database). Bioregions (Source: IBRA Version 7.0, © Commonwealth of Australia and Department of Climate Change, Energy, the Environment and Water 2024). Incidental fauna and Project footprint (Source: Niche Environment and Heritage, 2023)

In these IBRA regions, KMGH is associated with several vegetation formations including various habitats such as grasslands, and wooded areas with grassy vegetation. Many Plant Community Types (PCTs) within those formations have been identified as potential KMGH habitat: Southern Tableland Grassy Woodlands, Tableland Clay Grassy Woodlands, Temperate Montane Grasslands, and Western Slopes Grassy Woodlands. (BioNet and KMGH threatened species profile on Office of Environment and Heritage (OEH) website).

This report evaluates the species polygon, referring to the region where direct impacts could arise due to the project on KMGH habitat. The project footprint involves an estimated disturbance area, which predicts the portion likely to be directly affected during both construction and operation phases, based on a preliminary design and construction approach. However, this estimated disturbance area might change during the detailed design stage, with potential for future measures to avoid or minimise impacts on the species habitat. Biodiversity assessments, such as vegetation and habitat surveys, have been conducted across accessible zones within the project footprint, with focused survey efforts carried out within the estimated disturbance area, used for all clearance and impact computations.

III. Expert assessment approach

The initial species polygon for KMGH was formulated under the assumption of its presence within the associated Plant Community Types (PCTs) in Bungonia, Crookwell, Murrumbateman, and the Inland Slopes Biogeographic Regionalisation for Australia (IBRA) subregions. The PCTs associated with the species are outlined in the Threatened Biodiversity Profile Data Collection (TBDC) under the Biodiversity Assessment Method (BAM).

In November 2023 seven plots were surveyed, following the methods for the Golden Sun Moth habitat assessment that can be used considering the food plants for *K. scurra*. Only one plot, BY-143 possessed extensive presence of *Themeda*, making it the prime location within the site for surveying. Additional properties examined comprised BY-130-19, BY-130-14, BY-130-03, BY-145, BY-146, and YG-001. However, none of these properties were deemed suitable for *Keyacris* habitat because of the minimal presence of *Themeda* and the lack of other food species.

The probability of their presence on BY-143 was moderate to low, as indicated by the satisfactory condition of the site and the moderate coverage of *Themeda*, suggesting a history that likely hasn't involved overgrazing or pasture improvement. The existence of three larger native reptile species in the paddock further supported this notion. Nonetheless, there was a scarcity of potential food plants (*Acaena echinata*) and an absence of native daisies, which was unexpected given the diversity of the ground layer. Despite spending several hours on the site, including conducting a quadrat survey—an effective method for detection—the surveyors did not come across any KMGH.

To refine this original polygon, a comprehensive analysis was conducted by considering both historical and current records of the Keys' matchstick grasshopper, along with suitable habitat records. This information was utilised to construct a MaxEnt model using the R program (version 4.3.2). The MaxEnt model generated a spatial prediction map that

illustrates the likelihood of the species' presence across the study area, taking into account various environmental variables. These variables include climatic factors such as annual mean temperature, temperature seasonality, precipitation seasonality, and specific temperature and precipitation values during different quarters of the year. Additionally, we incorporate elevation data to capture the influence of topography on species distribution. Moreover, road proximity information is integrated as a predictor variable, recognizing its potential impact on habitat fragmentation and species movement. By leveraging these diverse environmental layers, the model aims to capture the complex interplay between climatic conditions, terrain characteristics, and landscape features, providing insights into the habitat suitability of *K. scurra*. The resulting output is represented as a continuous surface, with higher values representing areas more suitable for the species (in raster format) (Figure 2).

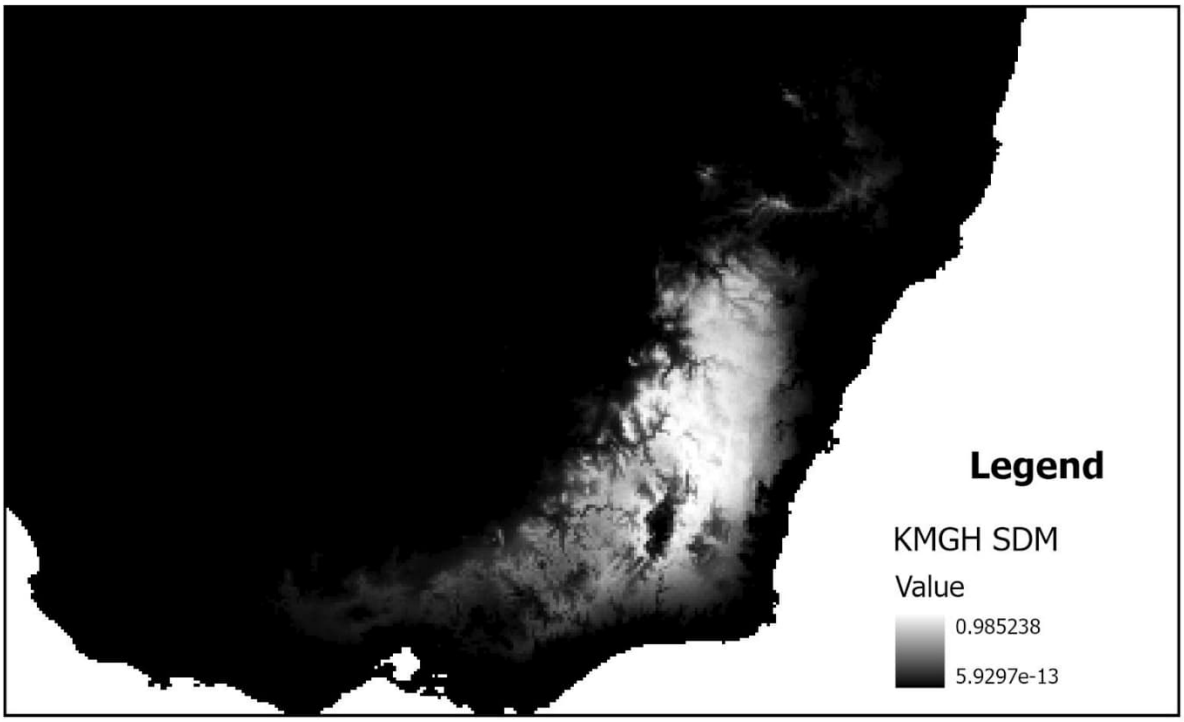


Figure 2 A predictive model of *K. scurra* distribution using Maxent (Source: Kearney - unpublished)

Subsequently, the output was transformed into two polygons, with values equal to or greater than 0.5. These values indicate higher probabilities of presence for the species being modelled, suggesting favourable habitat conditions. Values closer to 1 indicate a higher likelihood of suitable habitat for the species, while values closer to 0.5 suggest moderately suitable habitat. Two outcome polygons were obtained: one simplifying the polygon (KSP1) and another without simplification (KSP2) (Figure 3). The original species polygon was then clipped using these two polygons and subsequently merged, resulting in a consolidated polygon (KSP3). All these procedures were carried out using ArcGIS Pro 3.2.1 (Figure 4).

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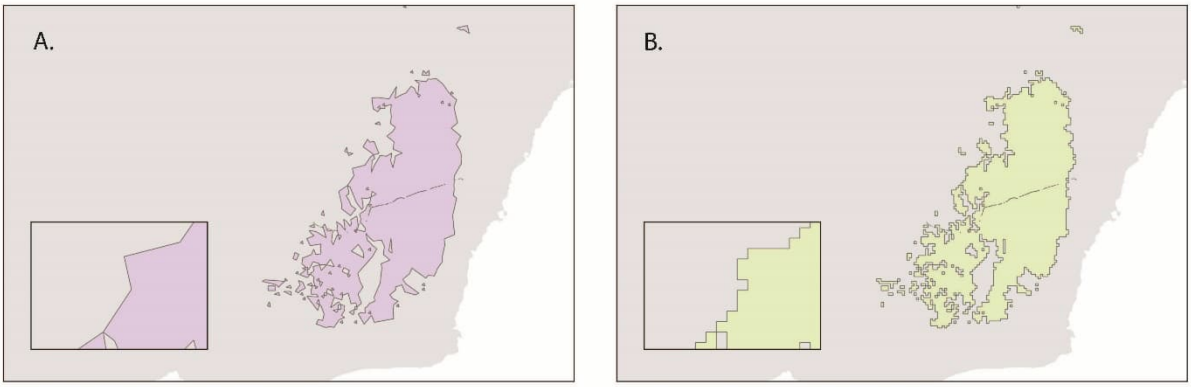


Figure 3 Polygons obtained from the SDM of *K. scurra*. A. Simplified polygon (KSP1). B. no simplified polygon (KSP2).

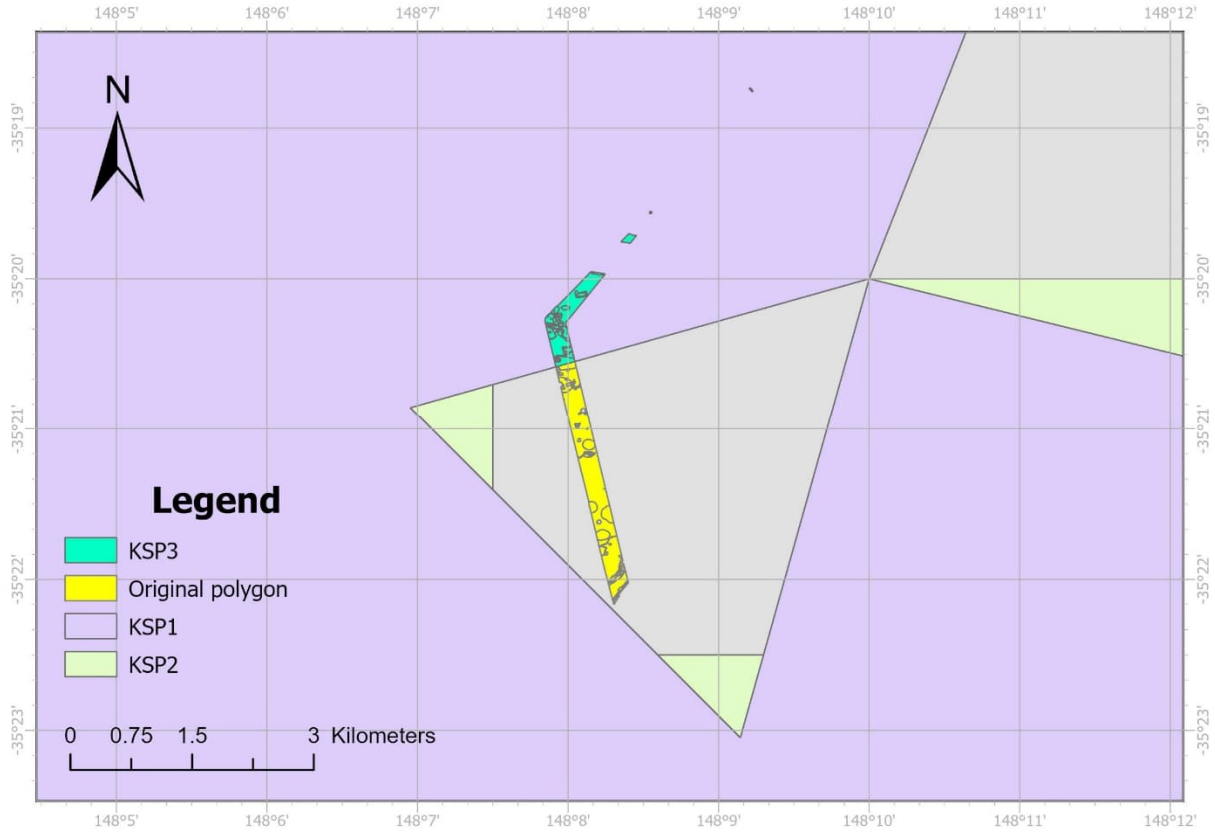


Figure 4 Close up of a reduced polygon in the project area (KSP3)

Limitations

K. scurra had never previously been collected or observed within the project footprint until the incidental record of 4 individuals in Murrumbateman during field surveys of October 2022 during GSM targeted surveys. Records were in good condition derived PCT 280. This was the best condition grassland site that was noted the habitat survey for GSM. However, KMGH has been observed 40 km away, suggesting the species might once have occurred, or might still exist in the survey area as unrecorded populations. Furthermore, records of plant

groups known to be food and habitat for the grasshopper species have been identified around the survey area, suggesting the possibility of an extant population.

There are certain challenges associated with surveys for KMGH, which can make it difficult to definitively determine its presence or absence. Initially, members of the Family Morabidae is considered a cryptic species, blending in with the surrounding vegetation at an individual level, as noted by experts. However, this obstacle can be addressed by disturbing the vegetation, prompting the individuals to move, particularly when ground temperatures exceed 15°C (though they may also move at temperatures as low as 7°C). Secondly, populations of this species can persist on a single food plant, which might be isolated from other suitable habitats, according to expert observations. This implies that all food plants within suitable environments (such as open canopies) should be examined to confirm absence, a task that can be daunting in large survey areas where not all habitat plants are known.

IV. Results

As per the findings of field specialists, the Niche November 2023 surveys undertaken at 16 locations within the designated area did not detect any individuals of the KMGH. Nevertheless, it's crucial to note that the absence of sightings should not be definitively interpreted as evidence of their absence. It's worth reiterating that only one plot was deemed suitable for the presence of *K. scurra*, and this specific plot was considered in the model's calculations. The plot has the presence of *Acaena echinata* and *Plantago lanceolata* plants considered as food source for the grasshopper species. Moreover, the site exhibits a moderate coverage of *Themeda*, indicating a historical absence of overgrazing or pasture improvement practices. The initial polygon provided by Niche was near 2187 ha. Considering the species distribution model, the polygon was reduced to approximately 1654 ha. The habitat mapped within the project footprint correspond to 1,618.82 ha, and the impacted habitat area (within indicative disturbance area) is about 161.89 ha.

Similarly to the majority of GSM habitat, they were classified as either low-quality or falling somewhere between low and moderate quality. This was primarily due to degradation and fragmentation resulting from grazing and pasture expansion activities (Rowel, 2023).

V. Potential impacts

Because of its wingless nature and unique life cycle as a winter species, *K. scurra* is particularly susceptible to the diverse impacts that could arise from the project, especially clearing activities. The majority of these potential impacts are anticipated to occur during the construction phase, with subsequent testing, commissioning, and operation stages representing a repetition of similar impacts albeit on a smaller scale.

- **Potential direct impacts:**

Habitat destruction: Clearing of vegetation and topsoil for site establishment work directly removes the grasshopper's habitat, reducing available food sources and shelter.

Disturbance of breeding grounds: Construction activities such as earthworks, excavation, and establishment of construction benches can disrupt breeding grounds and nesting sites for the grasshopper, impacting its life cycle.

Loss of food sources: Construction of access tracks, road improvements, and utility relocations may result in the destruction of plants that the grasshopper feeds on, leading to food scarcity.

Physical harm: Grasshoppers may be directly harmed or killed during construction activities, such as excavation, earthworks, or installation of structures.

- **Potential indirect impacts:**

Habitat fragmentation: Construction of access tracks and road improvements can fragment the grasshopper's habitat, isolating populations and limiting genetic diversity.

Changes in microclimate: Construction activities can alter local microclimates, affecting temperature and humidity levels that are crucial for the grasshopper's survival and development.

Chemical exposure: Installation of electrical equipment and use of construction materials may introduce chemicals into the environment, potentially contaminating soil and water sources that the grasshopper and related species relies on.

Noise and vibrations: Construction activities generate noise and vibrations, which can disrupt the grasshopper's behaviour, and communication.

Barrier to movement: Installation of security fencing and other barriers can hinder the grasshopper's movement, restricting its ability to forage, find mates, and disperse to new habitats.

Altered ecosystem dynamics: Changes to the landscape and ecosystem dynamics due to construction activities may have cascading effects on other species that interact with the grasshopper, disrupting ecological balance.

VI. Avoiding and minimising impacts

To mitigate these impacts, implementing post-construction rehabilitation and revegetation efforts should be considered. As Rowel (2023) mentioned for the GSM, before construction begins, a thorough mapping of the species habitat in the footprint area is crucial. This mapping identifies areas where suitable habitat exists or is likely to exist pinpointing specific locations of habitat patches. Additionally, it's recommended to conduct focused surveys during spring under suitable conditions to confirm their presence in areas with the highest potential. Efforts should focus on avoiding and mitigating impacts on these sites. Micrositing

of transmission line infrastructure and associated work sites should prioritize avoiding native grasslands and mapped habitat wherever feasible. Utilizing existing tracks and planning construction activities to steer clear of mapped habitat areas is advised. In cases where habitat disturbance is unavoidable, rehabilitation efforts should involve planting appropriate native grasses without the use of fertilizers. These plantings should include grasses such as Kangaroo grass (*T. triandra*) and native daisies of the Family Asteraceae (genus *Chrysocephalum*, *Leptorhynchos*, etc.). Worth mentioning the consideration of subspecies based on the distribution area of these daisies. Temporary nurse crops may be employed to stabilize the soil and suppress weeds during the establishment phase. Biosecurity measures must be implemented during construction to prevent the introduction and minimize the spread of existing weeds within the project area. Furthermore, post-construction and operational maintenance programs should include follow-up weed control without the use of herbicides in replanted areas, to ensure the long-term health of the ecosystem.

Other species within the same family, such as *Vandiemenella viatica*, have been observed to exhibit signs of recovery when they are situated under or in close proximity to power lines, particularly if certain patches of native vegetation are preserved in the surrounding area.

VII. Conclusion

The findings from the incidental fauna record, literature review, existing data analysis, and field surveys conducted in 2023 have confirmed the presence of potential habitat for Key's matchstick grasshopper within the project footprint. The majority of this habitat was classified as low-quality, characterized by small, discrete patches susceptible to degradation and fragmentation due grazing and pasture expansion.

Using a species distribution model, the initially delineated habitat polygons underwent a reduction of 24.3%. Considering the flightless nature of the KMGH, it is crucial to consider targeted measures aimed at mitigating potential impacts on its habitat. These measures must focus on minimizing disturbance and fragmentation, thus ensuring the preservation and potential regeneration of suitable habitats vital for sustaining KMGH populations within the project footprint

In instances where it is not feasible to entirely avoid impacts on KMGH habitat, commitments to biodiversity offset requirements will be fulfilled as necessary. This ensures that any unavoidable impacts are adequately mitigated, thereby contributing to the overall conservation and protection of Key's matchstick grasshopper populations in the region.

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2 May 2026

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Expert report on the presence of Pink-tailed Legless Lizard *Aprasia parapulchella* habitat in the subject land for the Victoria to New South Wales Interconnector West project, Gregadoo, NSW

Capital Ecology project no. 3497

Dear Michelle Patrick,

Prepared in accordance with section 5.3 of the NSW Biodiversity Assessment Method 2020 (BAM), Attachment 1 to this letter provides my expert report on the presence of the Pink-tailed Legless Lizard *Aprasia parapulchella* habitat in the subject land for the Victoria to New South Wales Interconnector West project located at Gregadoo, NSW.

The conclusion of my assessment is that *A. parapulchella* is unlikely to be present on or use habitat on the subject land.

I trust that this report provides the advice and assessment required. If, however, you should have any questions, please do not hesitate to contact me.

Yours sincerely,



Robert Speirs
Director / Principal Ecologist
BAppSc (Ecology), DipPM, MEIANZ, CEnvP-E, BAM Assessor (No: BAAS17089)
Approved BAM Expert – Striped Legless Lizard, Pink-tailed Legless Lizard, and Golden Sun Moth

Attachments:

Attachment 1. Expert report on the presence of Pink-tailed Legless Lizard *Aprasia parapulchella* habitat in the subject land for the Victoria to New South Wales Interconnector West project, Gregadoo, NSW.

Attachment 1. Expert report on the presence of Pink-tailed Legless Lizard *Aprasia parapulchella* habitat in the subject land for the Victoria to New South Wales Interconnector West project, Gregadoo, NSW

Citation: Capital Ecology (2026). *Expert report on the presence of Pink-tailed Legless Lizard Aprasia parapulchella habitat in the subject land for the Victoria to New South Wales Interconnector West project, Gregadoo, NSW*. Final 01 – 2 May 2026. Prepared for WSP Australia Pty Ltd. Authors: R. Speirs and J. Thornberry. Project no. 3497.

1. Overview of the project and relevance of the Pink-tailed Legless Lizard

Transgrid and VicGrid 'VNI West' (formerly Transmission Company Victoria) are jointly developing a new electrical connection between NSW and Victoria called the Victoria to NSW Interconnector West project (VNI West). VNI West would form a second transmission link between NSW and Victoria to harness clean, low-cost electricity from Renewable Energy Zones (REZs) in both states and improve the reliability and security of electricity supply. VNI West is a priority project for the Australian Energy Market Operator (AEMO) and the Commonwealth, NSW, and Victorian governments.

VNI West proposes the construction, operation and ongoing maintenance of a high voltage, 500 kV double circuit overhead transmission line that would connect the high voltage electricity grids in NSW and Victoria. Specifically, VNI West would connect the Western Renewables Link proposal at Bulgana in Victoria with the EnergyConnect (NSW – Eastern section) project (SSI-9172452) at the Dinawan substation in NSW. The connection would be made via a new substation near Kerang in Victoria.

Transgrid is responsible for seeking the required planning approval and delivering the NSW component of VNI West (referred to as 'VNI West (NSW)') in the Riverina Region of NSW and would provide the 500 kV transmission line component of the connection for the VNI West project. The amended project would be located between the NSW/Victorian border near Murrabit in Victoria and Dinawan substation (the 330 kV component of which is has been constructed as part of the EnergyConnect (NSW – Eastern section) project) (the 'revised project footprint' for the 'proposed development'). The amended project would also include replacement of around nine kilometres of an existing single circuit 330 kV transmission line (Line 51) with a double circuit 330 kV transmission line generally between Ivydale Road (south of the existing Wagga 330 kV substation) and the future Gugaa 500 kV substation, Livingstone Gully Road (the substation component of which is subject to separate planning approval as part of the HumeLink project (SSI-36656827)). The amended project would also include an expansion of the Dinawan substation, installation of new shunt reactors and connections works at the existing Wagga 330 kV substation and connection works at the future Gugaa 500 kV substation, Livingstone Gully Road .

WSP Australia Pty Ltd (WSP) is currently undertaking ecological investigations on behalf of Transgrid to inform a revised Biodiversity Development Assessment Report (BDAR) (WSP, 2025[1]) for the proposed development.

The 'subject land[2]' for the purpose of this assessment incorporates all areas of the revised BDAR subject land previously identified as supporting surface rock and/or outcropping, including an additional 50 m buffer to these areas (area = 23.93 ha). The subject land is wholly located within the Wagga Wagga City Council Local Government Area (LGA).

[1] WSP Australia Pty Ltd (2025). *Revised Biodiversity Development Assessment Report: Victoria to New South Wales Interconnector West (VNI West) (NSW).* Prepared for Transgrid.

[2] Note: The 'subject land' for this assessment differs from the subject land definition in the revised BDAR.

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The Pink-tailed Legless Lizard *Aprasia parapulchella* (Kluge, 1974) (Pygopodidae) is listed as 'vulnerable' pursuant to both the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the NSW *Biodiversity Conservation Act 2016* (BC Act). As shown in Figure 3, the subject land is partially located within the indicative species distribution model developed by the NSW Department of Climate Change, Energy, the Environment, and Water (DCCEEW) for *A. parapulchella* (NSW Government, 2025). Additionally, as shown in Figure 4, the subject land is located within the area identified as 'Species or species habitat likely to occur' on the layers sourced from the Distribution Map provided on the EPBC Act SPRAT Profile for *A. parapulchella* (Commonwealth of Australia, 2025[3]).

Aprasia parapulchella is identified as a 'candidate species' under the BAM for two NSW Plant Community Types (PCTs) identified and mapped by WSP as occurring within the subject land:

- PCT 277 – Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
- PCT 319 – Tumbledown Red Gum - White Cypress Pine hill woodland in the southern part of the NSW South Western Slopes Bioregion

Analysis of spatial data provided by WSP indicates that those areas of the subject land supporting surface rock were previously identified as potential habitat for *A. parapulchella*. Although rock-turning surveys were undertaken by WSP in spring 2025 targeting *A. parapulchella* within the subject land, this method is no longer supported by the NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW) for assessing presence/absence for *A. parapulchella*, as per the BioNet Threatened Biodiversity Data Collection (TBDC) (NSW Government, 2026).

2. Requirement for expert report

In accordance with section 5.2.5 of the BAM, the BAM Assessor must establish and document in the revised BDAR whether each candidate 'species credit species'[4] is present on the subject land (or specific vegetation zone). A 'species polygon' must be prepared for each species credit species determined as occurring in the subject land, and this is used to calculate the quantum of offsets required for impacts on the species.

In accordance with section 5.2.4 of the BAM, to determine presence for a development proposal (such as the Modification), the BAM Assessor must apply one of the following options.

a. *assume the species is present, or*
b. *conduct a threatened species survey, as per Section 5.3, or*
c. *obtain an expert report, as per Box 3, or*
d. *for candidate species including dual credit species, where the TBDC indicates that an important habitat map identifies the species credit component, the assessor must confirm whether the subject land is within an area identified on the important habitat map[5].*

Notwithstanding the above, as noted in Section 1, following an October 2024 update to the *BioNet Threatened Biodiversity Data Collection* (TBDC) (NSW Government, 2026), the NSW DCCEEW now

[3] Commonwealth of Australia (2025). *Species Profile and Threats Database. Aprasia parapulchella – Pink-tailed Worm-lizard* https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=1665.
[4] Species credit species are threatened species for which vegetation surrogates and/or landscape features cannot reliably predict the likelihood of their occurrence or components of their suitable habitat.
[5] The TBDC does not indicate that an important habitat map identifies the species credit component for *A. parapulchella*.

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"recommends that this species is assessed by expert report due to difficulty in detecting with confidence via survey".

In light of the above, WSP Australia Pty Ltd (WSP) has determined that obtaining an expert report prepared in accordance with Box 3 under section 5.3 of the BAM is required for the purpose of developing a species polygon to be used to calculate the quantum of offset credits for *A. parapulchella* under the BAM. I have prepared this report to address this requirement.

As outlined in Box 3 –

> *An expert report must set out whether:*
>
> *a. the species is unlikely to be present on or use habitat on the subject land, in which case, no further assessment of the species is required, or*
>
> *b. the species is likely to be present on or use habitat on the subject land.*
>
> *If the species is likely to be present on or use the subject land, the expert report must:*
>
> *a. identify the species or population*
>
> *b. justify the use of an expert report*
>
> *c. justify the likelihood of occurrence of the species or population and prepare a species polygon as per Subsection 5.2.5*
>
> *d. estimate the area of habitat (if the species is assessed by area) or the maximum number of individuals (if the species is assessed by count of individuals) on the subject land. Evidence such as a population estimate from a reference site could be used to justify this estimation*
>
> *e. include the information considered in making this determination*
>
> *f. state the expert's credentials.*

3. Outline of experience in the ecological research, habitat assessment, and survey methods for *A. Parapulchella* (the expert's credentials)

I have worked as a full-time ecological consultant since January 2008. Since July 2010, I have been based in Canberra and specialised on the temperate woodlands and grasslands of the South-eastern Highlands bioregion (NSW and Australian Capital Territory [ACT]). *Aprasia parapulchella* has been a key focus species for my work and research each season since spring 2010, and I have completed more than 100 projects across this region involving *A. parapulchella* habitat assessment, targeted surveys, and/or species/habitat conservation plans. I have undertaken many of the large-scale *A. parapulchella* surveys, habitat mapping, and monitoring projects commissioned by the ACT Government since spring 2010. I have also completed targeted surveys and/or habitat assessments at many sites in the Queanbeyan-Palerang, Yass Valley, Goulburn Mulwaree, and Snowy Monaro LGAs.

I have been an active member of numerous working groups and advisory panels convened by the Commonwealth Government and the ACT Government regarding threatened grassland and woodland fauna, notably including for threatened grassland reptiles. I am currently a member of the ACT Government's Expert Working Group established to explore the functional connectivity requirements for grassland reptiles in the ACT.

I have been engaged by the Commonwealth Department of Climate Change, Energy, the Environment, and Water (Commonwealth DCCEEW) to run field classes for the department's EPBC Act assessment officers on the recognition and assessment of EPBC Act listed species and communities, including for *A. parapulchella*. I have also presented on *A. parapulchella* at professional forums and am regularly sought

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by many of the prominent government and private development projects in the region to provide survey and assessment services, peer review, and/or an advisory role relating to *A. parapulchella* and other threatened species. As part of my studies at Googong Township since 2010, I have led several springtime community engagement walks in the 54 ha Googong Township Pink-tailed Worm-lizard Conservation Area.

In recognition of the above, I was approved on 3 September 2024 by the NSW DCCEEW as a species expert for *A. parapulchella* in accordance with section 5.3 of the BAM.

4. Pink-tailed Legless Lizard – species overview

The Pink-tailed Legless Lizard *Aprasia parapulchella* (Kluge, 1974) is listed as 'vulnerable' pursuant to both the Commonwealth EPBC Act and the NSW BC Act. *Aprasia parapulchella* is a member of the family Pygopodidae, a group of lizards that lack forelimbs and have hind limbs reduced to small vestigial flaps (Cogger, 2014[6]). *Aprasia parapulchella* is a small, fossorial (living primarily, but not exclusively, underground) reptile, characterised by its grey-brown to pale grey body coloration and pink to reddish-brown tail (Wong *et al*., 2011[7]).

4.1 Distribution

Aprasia parapulchella occurs over a broad but fragmented distribution west of the great dividing range throughout NSW, Victoria, and the ACT. In NSW, the species' distribution is particularly patchy with apparently isolated populations occurring in the Central Tablelands, Southern Tablelands, Northern Tablelands, and South-western Slopes (Commonwealth of Australia, 2015[8]) (refer to Figure 3 and Figure 4). *Aprasia parapulchella* occurs within a broad elevation range, with populations recorded from 180 m above sea level (ASL) near Bendigo, Victoria to 815 m ASL in South Canberra, ACT (Wong e*t al*., 2011).

In the ACT and the Southern Tablelands of NSW, the distribution of *A. parapulchella* appears to be restricted to areas of suitable lithology and rock cover, where substantial vegetation disturbance (e.g. pasture improvement, urban development etc.) has not occurred, likely owing somewhat to the presence of these protective landscape features. Due to a substantially lower degree of survey effort and research undertaken into the distribution of *A. parapulchella* in the Central Tablelands of NSW, there is less known about the factors influencing the distribution of the species in this region (Wong *et al*., 2011). However, given the broad climatic, geologic, and vegetation similarities between eastern portions of the Central Tablelands of NSW and the ACT, it is likely that the habitat requirements influencing the distribution of the species in these areas are relatively similar.

The habitat requirements influencing the presence of *A. parapulchella* at a given location are not necessarily consistent across its known range. Populations of *A. parapulchella* are known to occur on the Hay Plain in south-west NSW where there is little to no surface rock (Michael and Herring, 2013[9]) and populations of the species occur near West Wyalong in western NSW within mallee shrubland

[6] Cogger H.G. (2014). *Reptiles and amphibians of Australia, 7th Edition*. CSIRO Publishing.
[7] Wong, D., Jones, S., Osborne, W., Brown, G., Robertson, P., Michael, D., & Kay, G. (2011). *The life history and ecology of the Pink-tailed Worm-lizard Aprasia parapulchella Kluge–a review*. Australian Zoologist, *35*(4), 927-940.
[8] Commonwealth of Australia (2015). *Conservation Advice – Aprasia parapulchella – Pink-tailed Worm-lizard*. Department of Climate Change, Energy, the Environment, and Water.
[9] Michael, D. and Herring, M. (2013). *Unexpected records of the pink-tailed worm lizard Aprasia parapulchella (Pygopodidae) in chenopod shrubland, Hay region, NSW*. Herpetofauna 43(1):14-17.

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vegetation communities supporting a relatively high overstorey and midstorey vegetation cover (Jones, 1999[10]).

4.2 Habitat

As above, the habitat requirements of *A. parapulchella* are highly variable across its range. In the ACT and NSW Southern Tablelands, the primary habitat of the species is broadly described as treeless or sparsely treed vegetation communities associated with well-drained mid-slopes or hilltops characterised by a high cover of scattered (e.g. lightly or non-embedded) rocks, usually of volcanic origin (Commonwealth of Australia, 2015). Sites within which *A. parapulchella* is most abundant are usually dominated by native, disturbance-sensitive grass species such as Kangaroo Grass *Themeda triandra*, and to a lesser extent Purple Wiregrass *Aristida ramosa* and Barbed-wire Grass *Cymbopogon refractus* (Wong et al. 2011, Jones 1999), likely owing to dominance of this species assemblage indicating a low degree of past vegetation disturbance within the given site. The species is unlikely to be found in areas in which a high degree of past vegetation/soil disturbance is evident, such as pasture improved areas or stock camps (Osborne 1993, Wong *et al*., 2011). As a specialist predator of ant brood, *A. parapulchella* is strongly associated with a number of ant species, often being detected under rocks also occupied by ants or in close proximity to active ant burrows (Wong *et al.*, 2011).

As noted in Section 4.1, although there is substantially less available information regarding the specific habitat requirements of *A. parapulchella* in the NSW Central Tablelands than in the ACT and Southern Tablelands of NSW, given the broad climatic, geologic, and vegetation similarities between eastern portions of the Central Tablelands of NSW and the ACT, it is likely that the habitat requirements of the species in these areas are relatively similar.

5. Methods

With regard to the *A. parapulchella* distribution and habitat characteristics, the 'key elements' that define the likelihood that potential habitat for *A. parapulchella* occurs in a given site (i.e. the subject land) as established in Armstrong et al. (in preparation[11]) are as follows.

1. Element 1 – Is the subject land located within the known geographical distribution of *A. parapulchella* (i.e. does it occur in an Interim Biogeographic Regionalisation for Australia [IBRA] subregion that the species is known to occur in)?

   If yes, proceed to Element 2.

2. Element 2 – Does the subject land support one or more of the PCTs within which *A. parapulchella* is known/predicted to occur in (i.e. a PCT for which the species is listed as a 'candidate species' under the BAM)?

   If yes, proceed to Element 3.

3. Element 3 – Does the subject land support appropriate lithology? That is, rock type/s consistent with those known or predicted to support *A. parapulchella* in the subject region.

[10] Jones, S. R. (1999). *Conservation biology of the Pink-tailed Legless Lizard Aprasia parapulchella*. PhD Thesis. (Doctoral dissertation, University of Canberra).
[11] Armstrong, R., O'Rourke, N., Speirs, R., Terry, W., Simpson, S., Michael, D. (in preparation). *Developing habitat descriptors for a threatened cryptic pygopod to determine potential habitat under the NSW Biodiversity Offset Scheme in Australia*.

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If the answer to Element 3 is in the affirmative, then the key elements that define the likelihood that *A. parapulchella* occurs in a given area (polygon) of the subject land are as follows.

4. Element 4 – Does the area have ≥ 1% cover of suitable habitat rocks[12] of appropriate lithology?

   If yes, proceed to Element 5.

5. Element 5 – Does the area currently[13] have ≤ 50% opaque crown cover (roughly equal to 25% projected foliage cover [PFC])?

   If yes, proceed to Element 6.

6. Element 6 – Does the area have a ≥ 1% cover of a low/moderate disturbance-sensitive C4 grass species in the understorey? (e.g. *Themeda triandra*, *Bothriochloa macra*, *Cymbopogon refractus*, *Sorghum leiocladum*)

   If yes, proceed to Element 7.

7. Element 7 – Does the area have a composition score (determined via the BAM Calculator) ≥ the nominal threshold[14] for the Vegetation Class.

In accordance with the above, this assessment has followed the below two-step process. Note, it is only necessary to proceed to Step 2 if the answer to Step 1 is in the affirmative.

5.1 Step 1 – Determine whether the subject land supports the key geographic elements necessary for *A. parapulchella* to occur (Elements 1 to 3).

5.1.1 Desktop assessment

Step 1 involved compiling and reviewing the technical documents and other resources relevant to the potential for *A. parapulchella* to occur in the subject land. This involved my review of project-specific information and other relevant literature resources, together with the development of a Geographic Information System (GIS) platform to collate, analyse, assess, and display each of the key geographic elements relevant to the potential for *A. parapulchella* occurrence, including the:

- available current aerial imagery;
- PCT and vegetation zone mapping prepared by WSP[15] (2025);

[12] Suitable habitat rocks are generally between 10 centimetres (cm) and 30 cm in width and 5 cm to 15 cm thick. There is often a preference for flat, plate-like rocks, rather than spherical boulder-like rocks. The strong preference for rocks of volcanic origin is well documented in some areas of the distribution of *A. parapulchella*; however it is not known whether this is so across the species' entire distribution.

[13] Assessed based on the current crown cover rather than the likely crown cover of the relevant PCT in an intact, remnant form. This is necessary to capture areas of 'derived' forms of the PCT which have a crown cover less than typical of the PCT and which are thereby characteristically suitable as *A. parapulchella* habitat (e.g. derived native grassland resulting from past clearance of the remnant canopy of woodland or forest).

[14] Nominal thresholds relate to the composition score generated by the BAM-C for a particular mapped vegetation zone. Specific thresholds for vegetation classes are not provided in this instance as the source literature (Armstrong *et al.* [*in preparation*]) is currently in preparation and is therefore subject to change.

[15] Vegetation mapping prepared by WSP (2025) is restricted to those areas intersected by the revised project footprint.

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- geology mapping layers from the NSW Seamless Geology Project (NSW Department of Primary Industries and Regional Development [DPIRD], 2024[16]);
- geological mapping from the Wagga Wagga 1:250 000 Geological Sheet SI/55-15 (Adamson C.L. and Loudon A.G.[17]);
- *Aprasia parapulchella* (and all other Pygopodid species) point data from NSW BioNet (NSW Government, 2025); and
- *Aprasia parapulchella* Distribution Map provided on the EPBC Act SPRAT Profile (Commonwealth, 2025).

5.1.2 Site inspection

With consideration of the above, on 9 February 2026, Jarmin Thornberry (Consultant Ecologist, Capital Ecology) and I undertook a site inspection of the subject land. During our inspection we assessed the habitat characteristics relevant to *A. parapulchella* within the subject land. Where potential habitat was identified within the subject land, an estimated habitat polygon was recorded via markup of an orthorectified aerial image, and where relevant a short description of the following landscape and vegetation attributes relevant to *A. parapulchella* was taken:

- observed, or apparent, lithology;
- landscape position;
- vegetation condition, including potential historic land use (where relevant);
- dominant native flora species in each vegetation stratum; and
- vegetation structure.

The overall habitat quality for *A. parapulchella* was estimated for each mapped habitat polygon based on the above attributes.

5.2 Step 2 – Assess the subject land to determine and map the portions of the subject land that are likely *A. parapulchella* habitat (Elements 4 to 7).

As described above, on 9 February 2026, we undertook a site inspection of the subject land. During this inspection we assessed the habitat characteristics relevant to *A. parapulchella* within each inspected area and the broader subject land.

6. Results

6.1 Literature review

As outlined in Section 5.1, I undertook a review of a selection of relevant literature regarding the known habitat requirements of *A. parapulchella* prior to attending the subject land. A brief summary of the resources reviewed is included below as Table 1.

[16] NSW Government (2024) *NSW Seamless Geology Project (version 2.4).* May 2024. NSW Department of Primary Industries and Regional Development

[17] Adamson C.L. and Loudon A.G. (1966) *Wagga Wagga 1:250 000 Geological Sheet SI/55-15, 1st edition*. Geological Survey of New South Wales, Sydney.

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Table 1. Literature review summary

Author(s) (year)	Study title	Key findings of relevance to habitat requirements of *A. parapulchella*
Osborne, W.S. *et al.* (1991)	*Distribution and conservation status of the endangered Pink-tailed Legless Lizard Aprasia parapulchella (Kluge) – Research report 5*	- *Aprasia parapulchella* is fossorial species and there is a strong correlation between the habitation of a number of ant species and *A. parapulchella* within microhabitat features. - Within the ACT, the species typically inhabits moderate to steep slopes ranging from 3° to 15° and is apparently less abundant on slopes with a southern aspect. - The species is usually found underneath small rocks (<500 cm^2 basal area), and occasionally beneath logs. - The species appears to be strongly associated with sites supporting a high cover of Kangaroo Grass, and to a lesser extent, other native tussock-forming grasses. However, exotic tussock-forming grasses were found to dominate the groundstorey at some sites at which the species persists. - The species appears to be absent from sites subject to intensive stock grazing and soil nutrification (e.g. stock camps).
Jones, S.R. (1999)	*Conservation biology of the Pink-tailed Legless Lizard Aprasia parapulchella* (Doctoral dissertation)	- Vegetation associations differ substantially across the range of the species. However, *A. parapulchella* is a specialist of grassy areas supporting scattered rock. - The species usually does not occur in areas supporting a cover of trees and/or tall shrubs. - Rocks utilised by the species are generally between 100 millimetres (mm) – 150 mm wide, 120 mm – 220 mm long, and 50 mm to 150 mm thick.
Wong, D. *et al.* (2011)	*The life history and ecology of the Pink-tailed Worm-lizard Aprasia parapulchella Kluge–a review*	- The species is strongly associated with landscapes supporting numerous lightly embedded surface rocks and open native vegetation dominated by grasses and shrubs, with some regional variation. - The species is unlikely to occur in areas that have undergone substantial historical groundstorey disturbance, such as pasture improved sites and stock camp areas. - Geological and soil type associations vary across the species' range, and includes volcanics, quartz sandstone, and metasediments.
Osborne, W.S. and Wong, D. (2013)	*The Extent and Habitat of the Vulnerable Pink-tailed Worm Lizard (Aprasia Parapulchella) in the West Belconnen-Ginninderra Creek Investigation Area: Confirmatory Distribution Surveys and Mapping*	- Potential habitat is defined as those areas supporting a cover of partially embedded rocks of appropriate size and volcanic origin, sparse tree cover, and native groundstorey supporting predominately native graminoids, particularly Kangaroo Grass, Red-leg Grass *Bothriochloa macra*, Mat-rush *Lomandra filiformis*, Purple Wire Grass, and Barbed-wire Grass. Areas supporting appropriate rock cover over a groundstorey dominated by more disturbance tolerant native grass species such as Speargrasses *Austrostipa spp*. and/or Wallaby Grasses *Rytidosperma spp*. may also constitute potential habitat. - Low quality potential habitat is defined as those areas supporting a cover of partially embedded rocks of appropriate size and volcanic origin that have undergone substantial disturbance such as intensive stock grazing, soil erosion, soil nitrification etc. This includes areas identified as former sheep camps etc.

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6.2 Desktop assessment of the subject land

As outlined above, and described in Section 5.1.1, I undertook a detailed desktop assessment of a number of resources relevant to the subject land prior to completing the site visit. The results of this desktop assessment are detailed below.

Analysis of recent aerial imagery

As described in Section 1, and illustrated in Figure 1 and Figure 2, the subject land encompasses 23.93 ha and is located approximately 7.5 km south-east of the city of Wagga Wagga, NSW, at its north-western extent.

It is evident through analysis of recent and historical aerial imagery that a substantial proportion of the subject land and surrounding landscape has undergone extensive historic canopy and midstorey vegetation clearance to facilitate cropping and improve grazing productivity. Those areas of the subject land still supporting an intact canopy are typically in a comparatively higher condition across all strata than those areas within which the canopy has been completely removed. It is also evident that the predominant vegetation formation across the lower portions of the subject land supporting deeper, more fertile soils is grassy woodland, grading into a shrubby woodland/dry sclerophyll forest vegetation formation in those higher areas supporting shallower soils.

Analysis of PCT and vegetation zone mapping

As illustrated in Figure 6, WSP (2025) has previously undertaken detailed PCT and vegetation zone mapping consistent with the requirements of the BAM in those parts of the subject land intersecting the revised project footprint. As noted in Section 6.3, it was confirmed during our site inspection that the vegetation condition in those areas of the subject land that are not intersected by the revised project footprint (or previous iterations thereof), and were therefore not mapped by WSP (2025), is broadly consistent with the adjacent and connected mapped vegetation. In the context of an expert report prepared under the BAM, the PCT and vegetation zone mapping is primarily used to refine the area of potential habitat for *A. parapulchella* within the subject land by identifying those PCTs within which the species is identified as a candidate species as per the BAM-C and the NSW TBDC[18]. This step of the desktop assessment aligns with Element 1 and Element 2 of the assessment process described in Section 4. The results of this analysis are displayed in Table 2.

Table 2. Plant community type association with *A. parapulchella* (NSW TBDC)

PCT ID	PCT Name	***A. parapulchella* identified as a candidate species**
		IBRA Subregion = Inland Slopes
277	Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	**Yes**
319	Tumbledown Red Gum - White Cypress Pine hill woodland in the southern part of the NSW South Western Slopes Bioregion	**Yes**
343	Mugga Ironbark - Red Box - Red Stringybark - Western Grey Box grass/shrub woodland on metamorphic substrates in the Tarcutta - Gundagai region, NSW South Western Slopes Bioregion	**No**

[18] NSW Government (2026). *Threatened Biodiversity Data Collection – Aprasia parapulchella – Ecological Data*.

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Analysis of geological mapping relevant to the subject land

As illustrated in Figure 7, a polygon depicting the subject land was overlaid on the NSW Seamless Geology Map (NSW Government, 2024) to determine the dominant geological formations represented within the subject land. This exercise, although not directly used to refine the area of potential habitat for *A. parapulchella* within the subject land, provides a broad insight into the potential habitat value of the subject land and wider locality by identifying those lithologies known to be compatible with the lifecycle of the species in the relevant IBRA region/subregion. The results of this analysis were largely as expected, with the subject land being mapped within rock units characterised by igneous rock types (e.g. granite).

Analysis of NSW BioNet point data for *A. parapulchella*

The nearest records of *A. parapulchella* to the subject land (within 100 km) are summarised below in Table 3 and illustrated in Figure 5. These records are discussed further in Section 6.3.

Table 3. Summary of nearby records of *A. parapulchella*

Year	Location description	Easting	Northing	Accuracy	Distance from Subject Land
2022	Mundarlo, NSW	Multiple		8 m	38 km
2006 – 2007	Holbrook, NSW	Multiple		10 m – 100 m	47 km
2020	Little Billabong, NSW	Multiple		4 m	49 km
2022	Bethungra, NSW	579859	6149352	10 m	64 km
2000	Goombargana, NSW	Multiple		100 m	92 km
2020 – 2022	Burrumbuttock, NSW	Multiple		4 m	94 km

Analysis of the NSW distribution map for *A. parapulchella*

As illustrated in Figure 3, a polygon depicting the subject land was overlaid on the *A. parapulchella* distribution map published by the NSW Government via the NSW Government Sharing and Enabling Environmental Data portal (NSW SEED)[19] to determine whether the subject land is located within the most recent modelled distribution area for the species. As shown in Figure 3, parts of the subject land are intersected by the modelled distribution area for *A. parapulchella*.

Analysis of the EPBC Act distribution map for *A. parapulchella*

As illustrated in Figure 4, a polygon depicting the subject land was overlaid on the *A. parapulchella* distribution map provided within the EPBC Act SPRAT Profile[20] to determine whether the subject land is located within the known distribution area of the species. As shown in Figure 4, the subject land is located within the 'likely' distribution area for *A. parapulchella*.

6.3 Classification of potential *A. parapulchella* habitat within the subject land

As described in Section 5.1, we undertook a site inspection of those areas of the subject land identified through the desktop assessment as having the potential to support habitat for *A. parapulchella*. With reference to the habitat requirements of *A. parapulchella* identified and discussed in Section 6.1 and

[19] NSW Government (2025). *Aprasia parapulchella distribution for Biodiversity Assessment Method* assessments. NSW SEED Portal.
[20] Commonwealth of Australia (2026). *Species Profile and Threats Database. Aprasia parapulchella – Pink-tailed Worm-lizard.* Department of Climate Change, Energy, the Environment, and Water.

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Section 6.2, per the standard habitat classification methodology employed by Capital Ecology for the species, I classified potential habitat as being of low, low – moderate, moderate, or high quality.

The factors considered in assessing the quality of potential habitat for *A. parapulchella* within the subject land included:

- mapped PCTs and vegetation zones;
- vegetation condition (e.g. native groundstorey dominance and forb diversity) in areas of the subject land adjacent to mapped vegetation zones;
- presence of loose surface rock;
- type, predominate size, and estimated cover of surface rock;
- vegetation structure (including climax [pre-1788] structure of derived grasslands and shrublands) and landscape connectivity of relevance to *A. parapulchella*; and
- vegetation condition, including evidence of substantial recent understorey disturbance incompatible with the life cycle of *A. parapulchella* (e.g. nutrification from stock camps, heavily grazed areas, soil erosion, recent/historic pasture improvement, and removal of topsoil for quarrying activities/borrow pits).

The results of the field-based habitat assessment are illustrated in Figure 8 and summarised below in Table 4.

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Table 4. Classification of potential *A. parapulchella* habitat within the subject land

Habitat class	Habitat description	Example photograph
High	N/A – Not identified in subject land	
Moderate	Areas identified as 'Moderate' quality potential habitat are characterised by a moderate cover of scattered surface rock of volcanic origin (e.g. granite) over a predominately native groundstorey dominated by native perennial grass species including Red-leg Grass *Bothriochloa macra*, Wallaby Grasses, Purple Wiregrass *Aristida ramosa*, and occasionally Plumegrasses *Dichelachne sp*., with a moderate diversity of native non-grass understorey species including Wattle Mat-rush *Lomandra filiformis* subsp. *coriacea*, Nodding Blue Lily *Stypandra glauca*, and Rock Fern *Cheilanthes sieberi*. Areas identified as 'Moderate' quality potential habitat typically occur within areas supporting a sparse remnant canopy.	
Low - Moderate	Areas identified as 'Low – Moderate' quality potential habitat are characterised by a moderate cover of scattered surface rock of volcanic origin (e.g. granite) over a native groundstorey dominated by disturbance tolerant native grasses including Weeping Grass *Microlaena stipoides*, Wallaby Grasses, and occasional Red-leg Grass, with a low diversity of native non-grass understorey species including Crumbweed *Dysphania pumilio* and Yellow Wood-sorrel *Oxalis perennans*. Areas identified as 'Low – Moderate' quality potential habitat typically occur within areas of derived grassland supporting a scattered to absent remnant canopy.	
Low	N/A – Not identified in subject land	

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6.4 Step 1 – Determine whether the subject land supports the key geographic elements necessary for *A. parapulchella* to occur (Elements 1 to 3).

Table 5. Assessment of whether the subject land supports the key geographic elements necessary for *A. parapulchella* to occur (Elements 1 to 3)

Subject Land	
Element 1 – Is the subject land located within the known geographical distribution of *A. parapulchella* (i.e. does it occur in an IBRA subregion that the species is known to occur in)?	**Yes**, the subject land is located: 1. in the area mapped as 'Species or species habitat likely to occur' on the EPBC Act Protected Matter Search Tool (PMST) (Commonwealth of Australia, 2026) Distribution map for *A. parapulchella*; 2. partially within the Indicative BAM Species Distribution (NSW Government, 2025) for *A. parapulchella;* 3. in the Inland Slopes IBRA subregion, a subregion within which *A. parapulchella* is known to occur; and 4. approximately 38 km south-west of the next nearest known record of *A. parapulchella*.
If yes, proceed to Element 2.	
Element 2 – Does the subject land support one or more of the PCTs within which *A. parapulchella* is known/predicted to occur in (i.e. a PCT for which the species is listed as a 'candidate species' under the BAM)?	**Yes**, *A. parapulchella* is identified as a 'candidate species' under the BAM for the following two NSW PCTs identified and mapped by WSP (2025) as occurring in the subject land: • PCT277 – Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion; and • PCT319 – Tumbledown Red Gum - White Cypress Pine hill woodland in the southern part of the NSW South Western Slopes Bioregion.
If yes, proceed to Element 3.	
Element 3 – Does the subject land support appropriate lithology? (i.e. rock type/s consistent with those known or predicted to support *A. parapulchella* in the subject region).	**Yes**. During my site inspection, I found the subject land to primarily support volcanic rock types (e.g. granite). As illustrated in Figure 7, this observed lithology is broadly consistent with the following rock unit mapped across the subject land by the NSW Seamless Geology Map (NSW Government, 2024). • *Mount Flakney Granite*. Described as medium to coarse-grained biotite-muscovite granite with rare coarse-grained feldspar phenocrysts. The observed lithology, and the rock unit mapped by the NSW Seamless Geology Map across the subject land, is broadly consistent with those known or predicted to support *A. parapulchella* in the Inland Slopes IBRA subregion.
If yes, proceed to Element 4. Otherwise, no further assessment required.	

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6.5 Step 2 – Assess the subject land to determine and map the portions of the subject land that are likely *A. parapulchella* habitat (Elements 4 to 7).

Table 6. Assess the subject land to determine and map the portions of the subject land that are likely *A. parapulchella* habitat (Elements 4 to 7).

Subject Land	
Element 4 – Does the area have ≥ 1% cover of suitable habitat rocks of appropriate lithology?	**Yes** – areas identified as likely habitat have ≥ 1% cover of suitable habitat rocks of lithology identified as being suitable for *A. parapulchella* within the Inland Slopes IBRA subregion (granite).
If yes, proceed to Element 5.	
Element 5 – Does the area currently have ≤ 50% opaque crown cover (roughly equal to 25% projected foliage cover)?	**Yes** – areas identified as likely habitat have ≤ 50% opaque crown cover.
If yes, proceed to Element 6.	
Element 6 – Does the area have a ≥ 1% cover of a low/moderate disturbance-sensitive C4 grass species in the understorey? (e.g. *Themeda*, *Bothriochloa*, *Cymbopogon*, *Sorghum*).	**Yes** – areas identified as likely habitat have ≥ 1% cover of a low/moderate disturbance-sensitive C4 grass species in the understorey.
If yes, proceed to Element 7.	
Element 7 – Does the area have a composition score (determined via the BAM Calculator) ≥ the nominal threshold for the Vegetation Class (Armstrong, [*in preparation*])?	**No** – a single vegetation zone mapped within the subject land by WSP (refer to Figure 6) has a composition score ≥ the nominal threshold[13] for the relevant vegetation formation: • PCT277 – Derived (no offset) However, no potential habitat for *A. parapulchella* was identified within PCT277 – Derived (no offset) (refer to Figure 7) during the site visit as the extremely limited area of this vegetation zone within the subject land (approx. 0.8 m^2) was observed to support no surface rock. As above, the subject land does not support any area that meets the requirements of Elements 4 – 6 of the likely species habitat assessment method and a composition score ≥ the nominal threshold for the relevant vegetation formation(s). As such, it is my assessment that the subject land does not support likely habitat for *A. parapulchella*.
If the answer to Element 7 is in the affirmative, draw a polygon based on this area, apply a 50 m buffer (constricted to the mapped extent of candidate PCTs), and allocate this combined area as the species polygon for *A. parapulchella* in the subject land as per Subsection 5.2.5 of the BAM (note that there may be one or numerous species polygons mapped within a given subject land).	

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7. Conclusion

Following the seven element assessment process detailed in Section 6.4 and Section 6.5, I conclude that *A. parapulchella* is unlikely to be present on or use habitat on the subject land. As such, in accordance with Box 3 of section 5.3 of the BAM, no further assessment for *A. parapulchella* is required and species polygons do not need to be prepared for the species.

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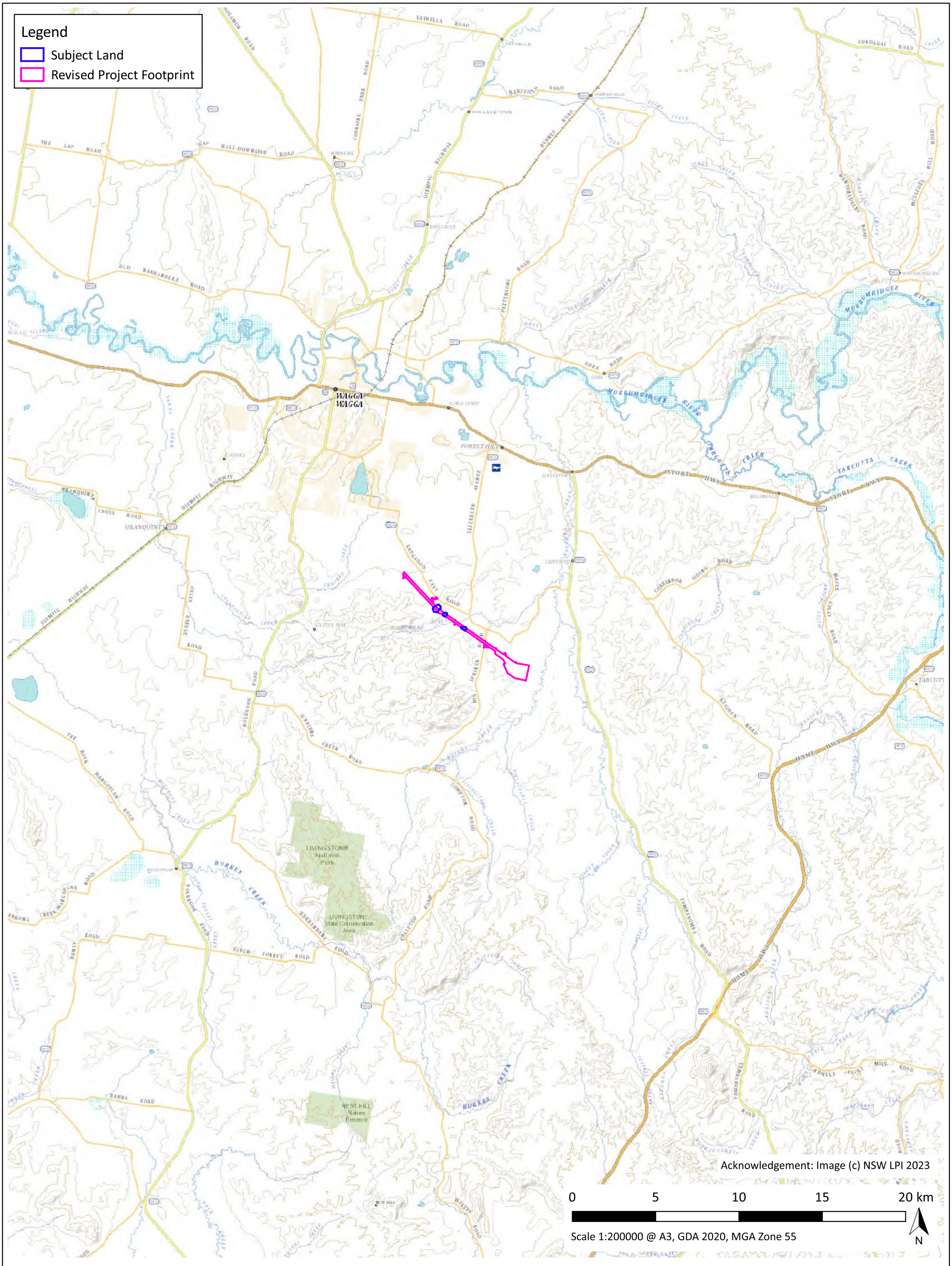


Figure 1. Locality Plan

Capital Ecology Project No: 3497
Drawn by: Robert Speirs
Date: 02/05/2026

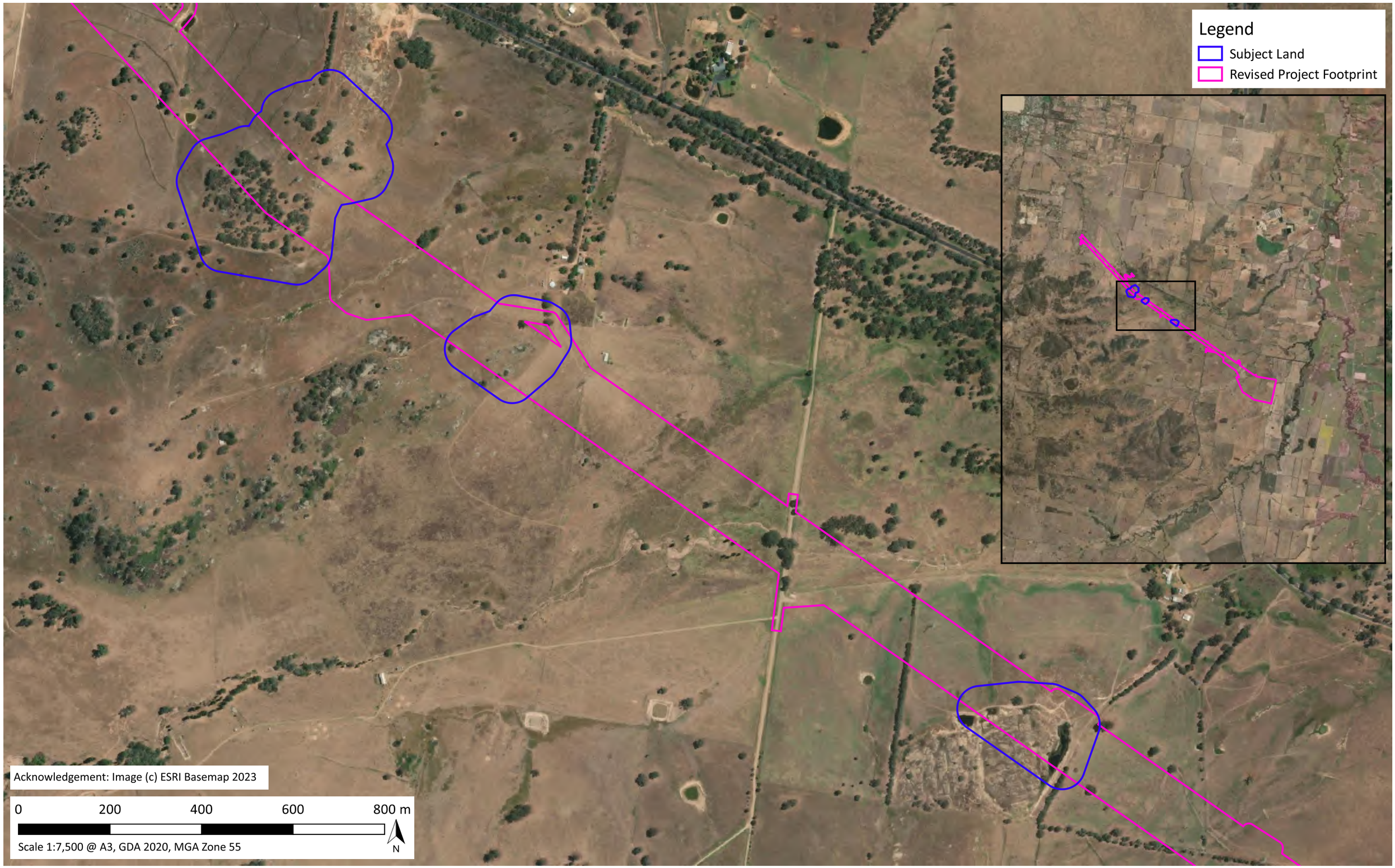


Figure 2. The Subject Land on Recent Aerial Imagery

Capital Ecology Project No: 3497
Drawn by: J. Thornberry
Date: 17/02/2026

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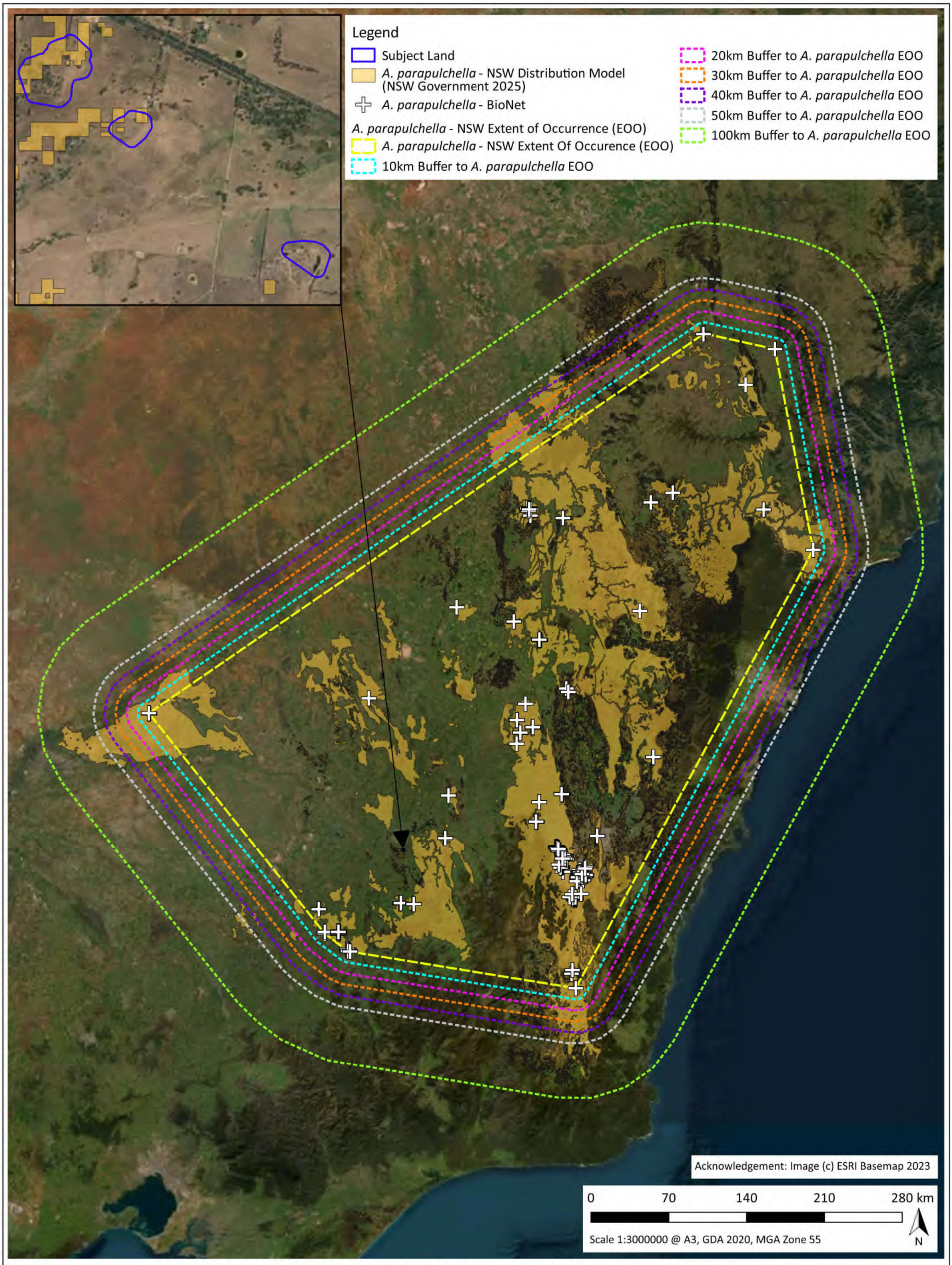


Figure 3. Pink-tailed Legless Lizard - NSW Records and Extent of Occurrence

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Date: 17/02/2026

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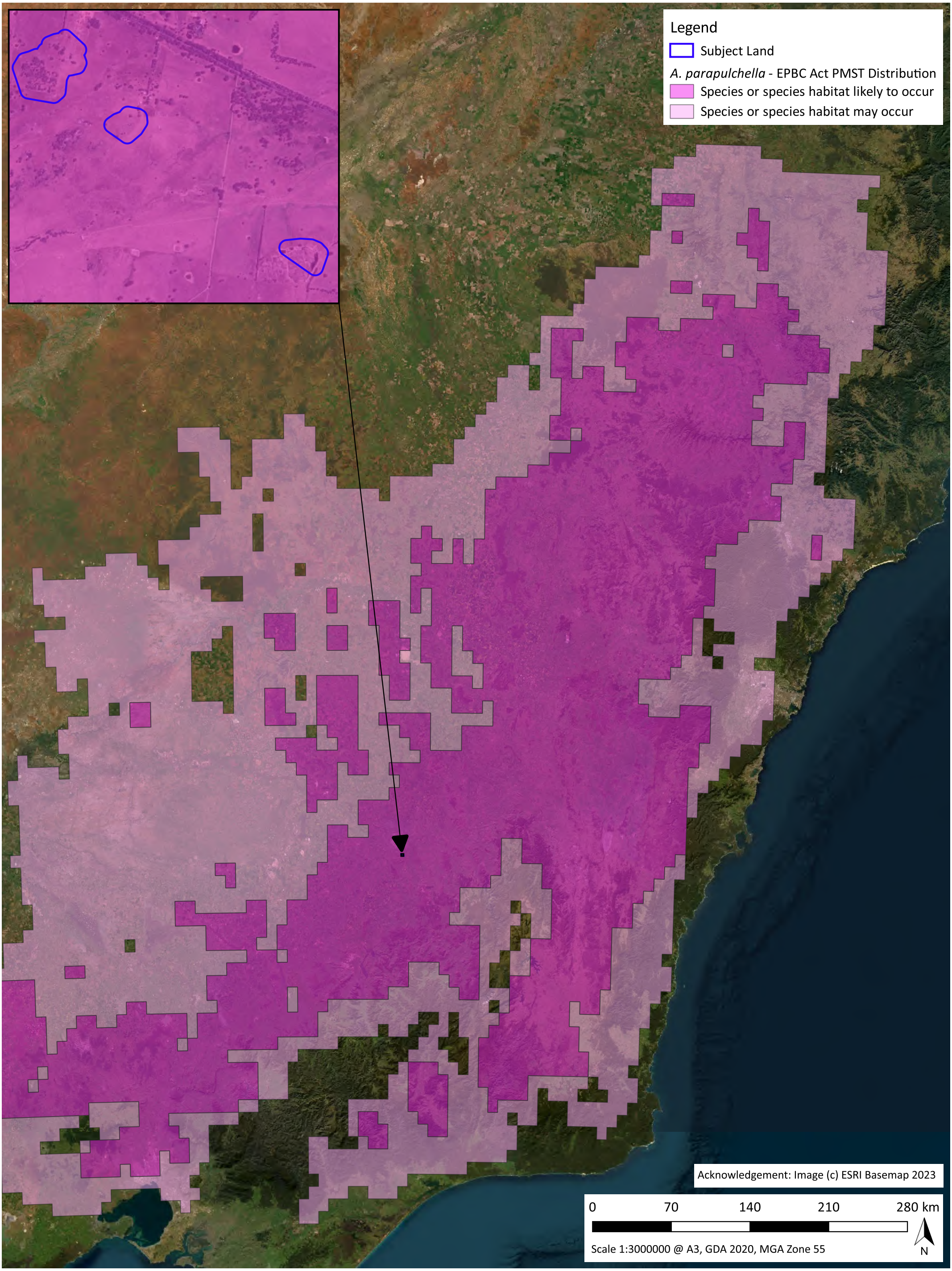


Figure 4. Pink-tailed Legless Lizard - Commonwealth Species Distribution Model

Capital Ecology Project No: 3497
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Date: 17/02/2026

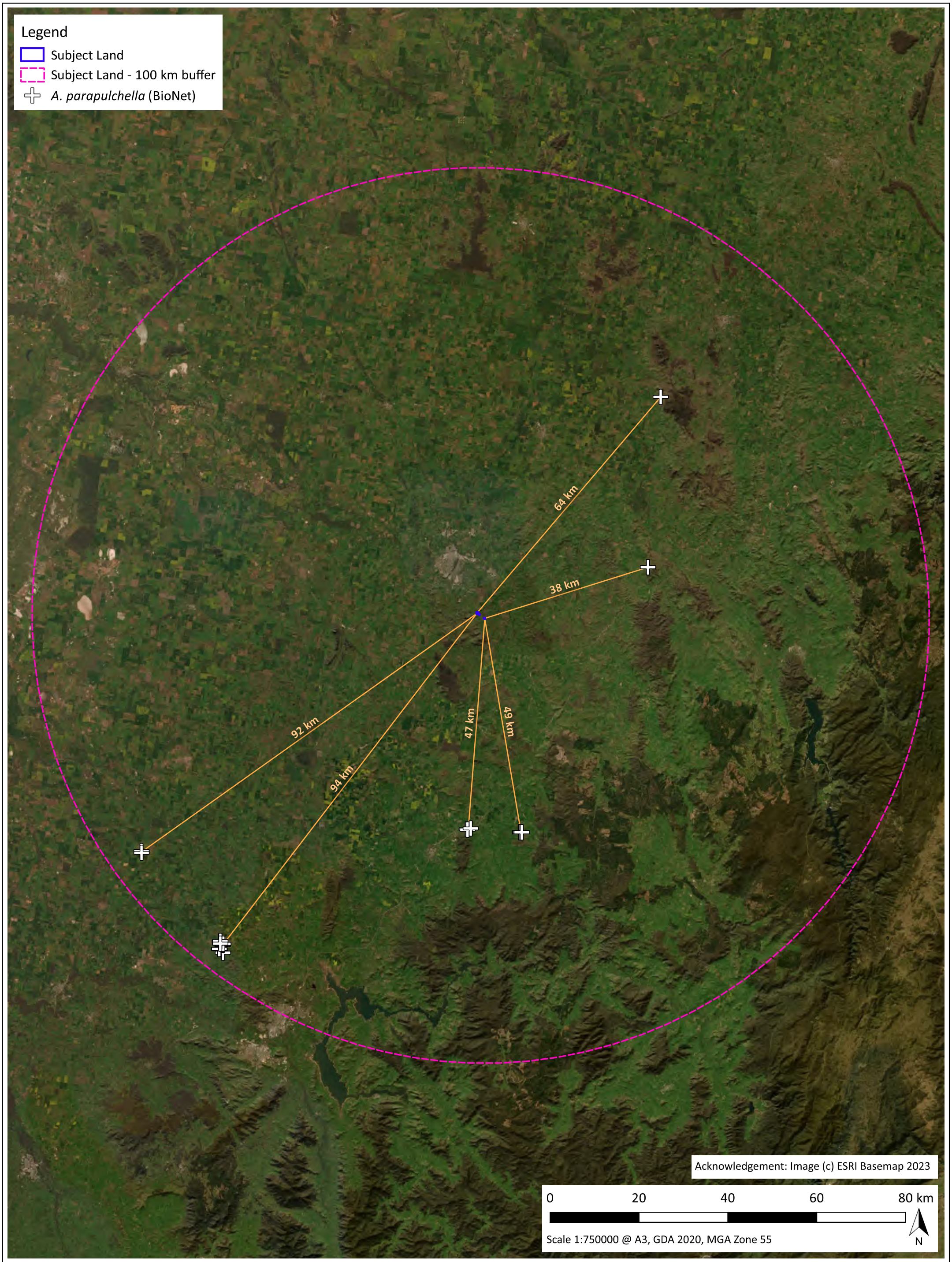


Figure 5. Pink-tailed Legless Lizard - NSW Records within 100 km of the Subject Land

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Date: 17/02/2026

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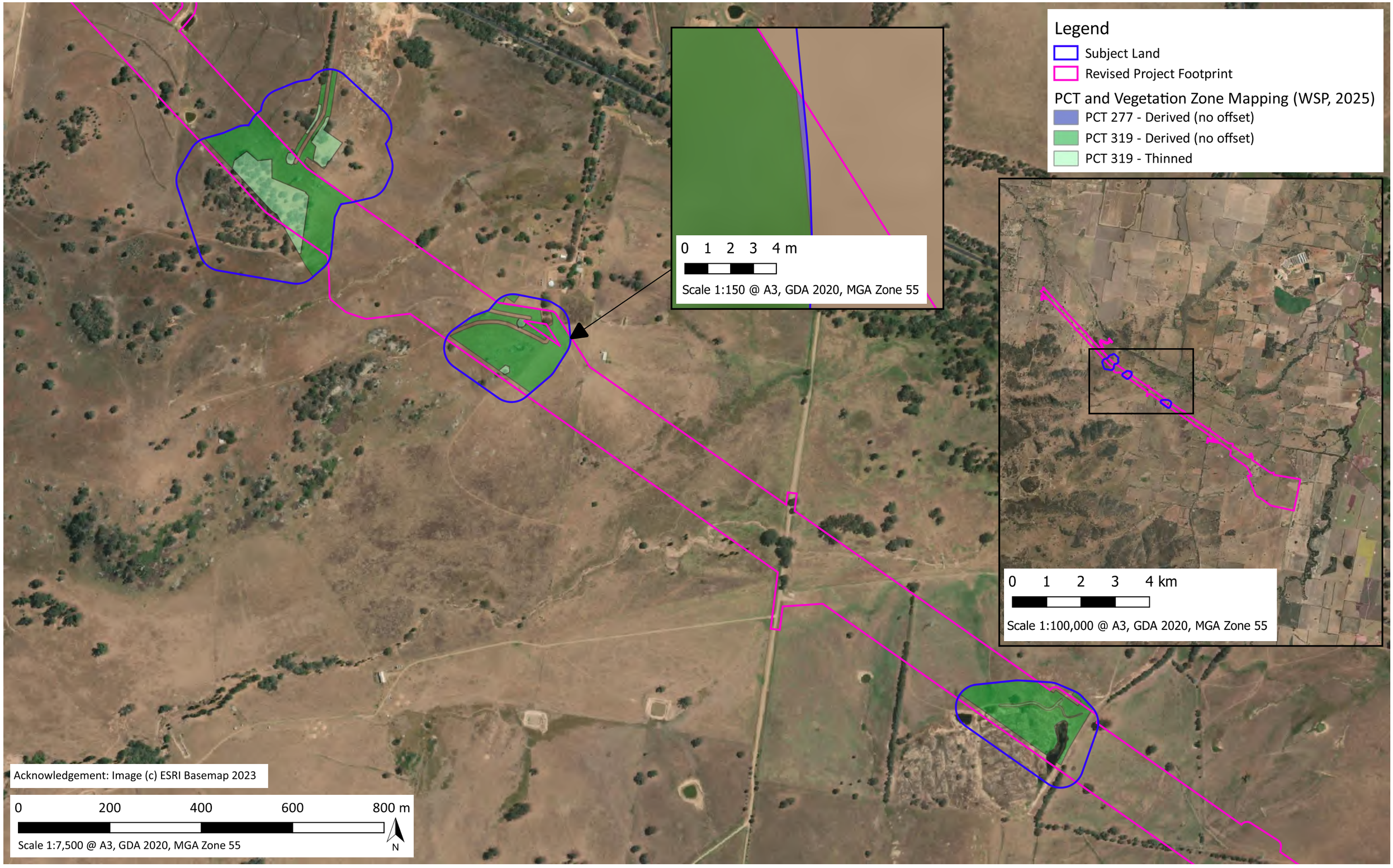


Figure 6. Candidate Plant Community Types for Pink-tailed Legless Lizard

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Date: 02/05/2026

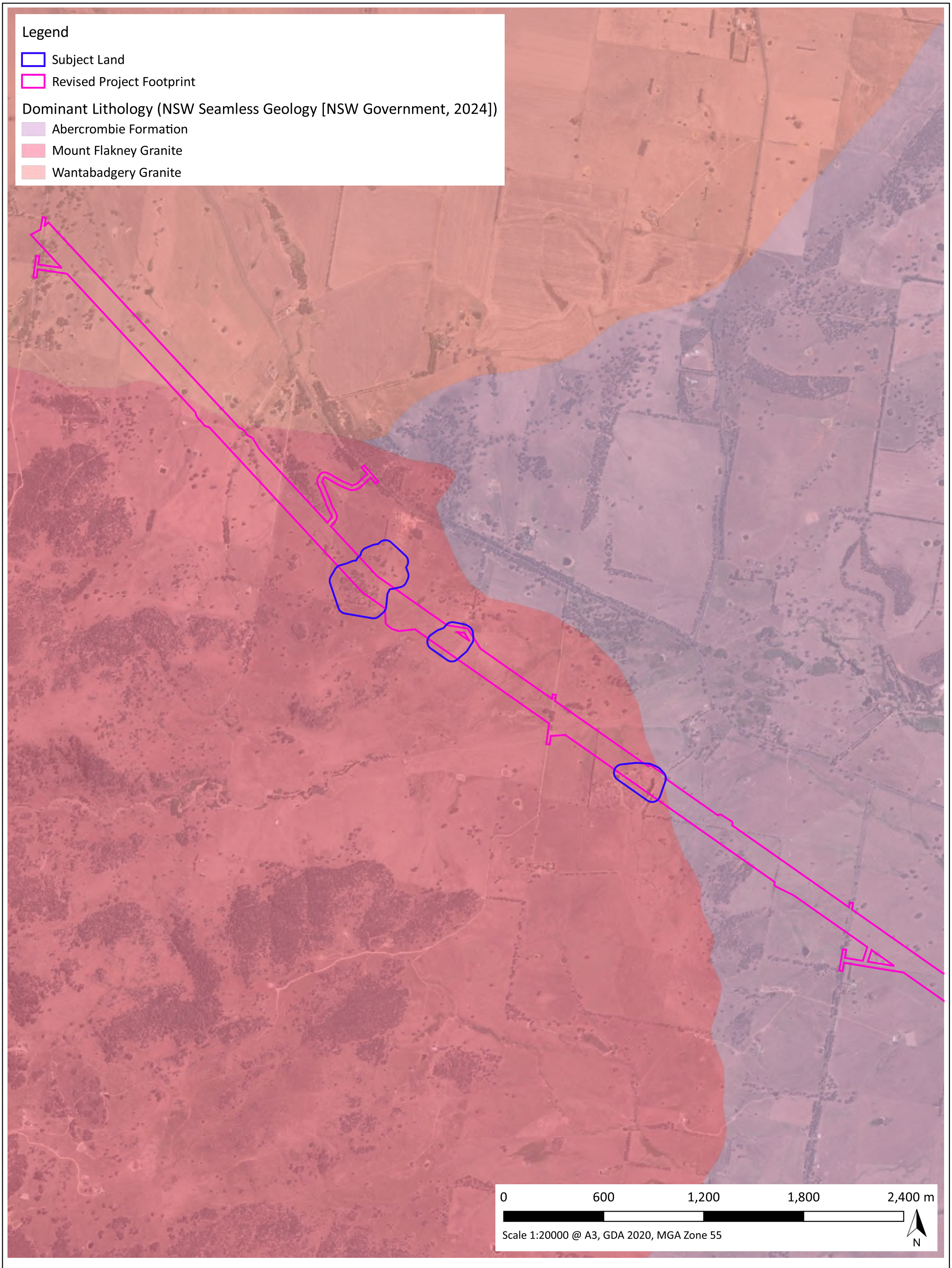


Figure 7. Dominant Lithology Mapping

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Date: 02/05/2026

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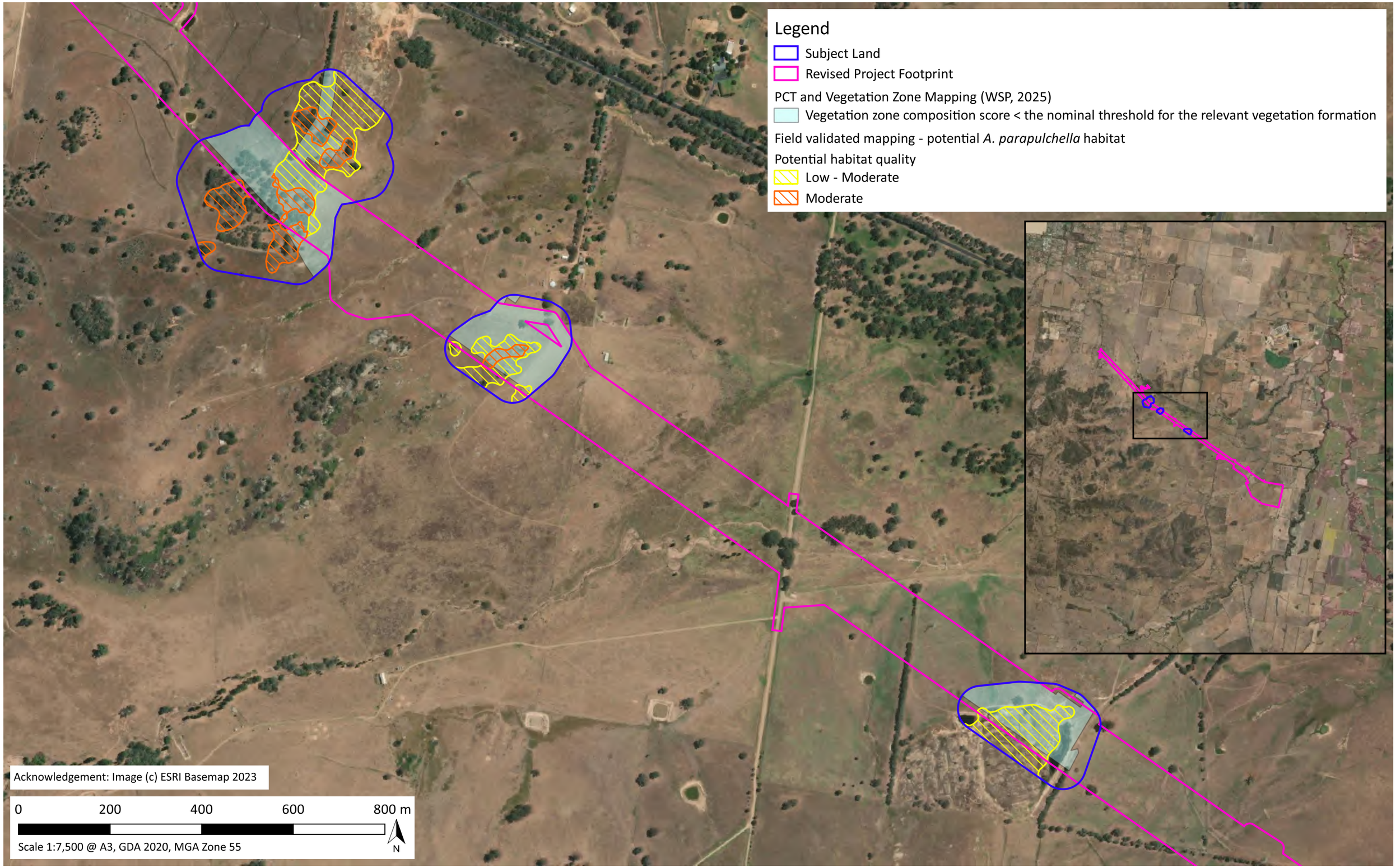


Figure 8. Field-based Habitat Assessment - Pink-tailed Legless Lizard

Capital Ecology Project No: 3497
Drawn by: R. Speirs
Date: 02/05/2026

Appendix J

Transmission line impacts on birds

J1 Introduction

This appendix provides information on the potential impacts of powerlines on bird species in relation to indirect impacts (as referred to in the NSW Biodiversity Assessment Method) that may be a possibility. This aspect of impact has been assessed as an indirect impact as it does not fall under one of the prescribed impacts listed under the Biodiversity Assessment Method. It outlines potential risks, assesses risk levels to threatened and migratory birds and provides information on mitigation measure research and options.

Ecologically, birds encounter power transmission infrastructure in two broad ways, as landscape features occurring in their resident territories, whether those territories are permanent or seasonal, or as unfamiliar features they encounter during long or short-distance movements. For birds which migrate, both broad types of power transmission infrastructure interaction may apply during different periods of their lifecycle.

The distinct types of impacts power transmission infrastructure represent to birds also fall into two broad categories:

- impacts associated with the power being carried through the infrastructure; and
- impacts the infrastructure represents as collision risks.

The different ways birds encounter power transmission infrastructure determines the type of risk infrastructure will represent to them. The potential impacts of electricity carried by electrical infrastructure are more likely to affect birds that are familiar with the infrastructure and regularly or continuously occur within the vicinity or use powerline infrastructure. Collision risks that power transmission infrastructure represent are more likely to affect birds that are unfamiliar with the locality, changes in locality infrastructure, presence of the infrastructure or lines themselves or that may be distracted by important natural behaviours that increase susceptibility to impacts.

Both behavioural groups are at risk from electrocution, for the same two behavioural reasons, both familiarity and ignorance.

Collision risk also represents a significant hazard to birds that are familiar with power infrastructure at a given location, just as humans might fall foul of familiar hazards due to concentration distractions. For example, while birds are defending territories, hunting, being hunted, or displaying aerially, they will naturally be more susceptible to collisions with infrastructure that is usually familiar to them and otherwise avoided, particularly if the obstacles have some degree of detection difficulty.

J2 Power transmission and electric and magnetic fields

J2.1 Measurement

Electricity is generated from both natural and artificial sources. Extremely low frequency (ELF) Electrical and Magnetic fields (EMF) are those that fall within the 0–3000 Hz frequency range. ELF EMFs exist wherever electricity is generated, transmitted or distributed in power lines or cables, or used in electrical appliances (2020). Although ELF EMFs are sometimes produced through natural processes, artificial sources are the most common sources of ELF EMF and are generally a product of the generation, distribution and use of electricity at the frequency of 50 Hz in Australia or 60 Hz in some other countries (arpansa, 2020). The electrical component of ELF EMF is formed by voltage, however current produces the magnetic field component of ELF EMF (arpansa, 2020).

The level of electrical fields is measured in thousands (k) of volts (V) per (/) metre (m), kV/m or just as V/m. The level of magnetic fields is measured in units of amperes (A) per (/) metre (m), A/m, however it is often denoted by its magnetic flux density quantified in units of tesla (T) or microtesla (μT). Another unit that is often applied to the quantification of magnetic fields is the gauss (G) or milliGauss (mG), where one gauss is equal to 10^4 T (or 1 mG = 0.1 μT) (arpansa, 2020).

J2.2 ELF EMF and birds

It is widely known and observed that, of all fauna groups, birds most regularly use electrical power lines, and their associated infrastructure, such as towers and poles, for perching and nesting. The reasons bird species use tall structures, such as electrical transmission infrastructure include:

- increased separation from terrestrial threats
- as vantage points to allow early detection of airborne and terrestrial threats
- for a commanding view over a patch of hunting territory
- for the defence and proclamation of breeding territories, and
- as safe elevated locations to build nests and raise their young.

The use of power lines does not extend across all bird species, as the open spaces in which aerial power infrastructure are located are too exposed for many bird species, especially smaller cover-preferring bird groups. Therefore, the most common powerline using groups are birds that use open and aerial habitats.

The infrastructure of electricity transmission is often desirable as nesting locations for large species, such as birds of prey and the corvids (ravens and crows), due to their propensity to build on high landscape features in otherwise open habitats. Birds of prey, storks and cranes, magpies and the corvids are the groups that are most likely to use the tallest power line infrastructure for nesting purposes.

While several small open country birds, such as larks, pipits and finches have been observed to use power lines, there appears to be a reduced use of the tallest power infrastructure by such species, due to the considerable expenditure of energy required to reach it and the considerable separation it represents from their territories and cover.

Aerial foraging species, such as dollarbirds, bee-eaters, swallows, martins and woodswallows are also frequent users of electricity infrastructure for resting or as hunting vantage points, however, the insect prey that this group targets can often be in greater densities closer to the ground, and so lower perches are more desirable when available.

Therefore, as the distance between vegetation from associated electricity infrastructure increases, many smaller bird species are generally less likely to use it, particularly when lower and less exposed options are present in their habitats.

In wooded habitats where vegetation heights more closely approach the height of power lines, birds appear more likely to use them, due to the increased opportunity to perch on power infrastructure where it is more conveniently accessible, because of the similarity of adjacent canopy heights.

J3 Effects of electric and magnetic fields on birds

Considerable research has been undertaken to determine if there are any significant effects from EMF upon living organisms, including birds. Several scientific papers have endeavoured to determine if there are changes to bird biology because of proximity to EMF with few undertaken on wild birds outside of laboratory contexts. Nevertheless, there are some studies which have tested the effects of EMFs on wild birds. These studies are described below and have found that:

- there are measurable physiological effects to birds subjected EMFs
- effects to birds exposed to EMFs are variable, in response to levels of discernible response, across different species, sexes, and time period, but those effects are not always cumulative
- it is somewhat difficult to predict responses by individuals to EMF exposure due to the range of different variables individuals encompass.

In their 2005 review paper, Fernie and Reynolds (2005) observe that electrical power lines are widely used throughout the developed world, and that, all electric currents, including those conducted by electrical power lines, produce electric and magnetic fields (EMFs). They note that, due to their propensity to use power line infrastructure, some birds, like humans, are exposed to EMFs throughout their lives. They also note that EMFs have been, not without controversy, implicated in adversely affecting different components of human health, and that past and ongoing laboratory research have used mammal and bird surrogates to determine if EMFs may adversely affect key life systems in humans. Their 2005 review, draws on previous EMF research on effects to wild and aviary kept birds, to determine if this body of work might contribute to the current knowledge on EMF potential to adversely affect humans (Fernie and Reynolds, 2005). They report that the majority of studies found, when birds are subjected to EMFs, changes are observed in; bird behaviour, reproductive success, growth and development, physiology and endocrinology, and oxidative stress, although not always with a consistent effect or direction (Fernie and Reynolds, 2005).

Fernie et al (1999) observed that some bird groups reproduce within the influence of EMFs from transmission lines, and that critical survival processes are dependent on melatonin, noting that melatonin has only been equivocally suppressed by EMFs in mammalian species. They erected a study to examine whether EMFs affect photophasic plasma melatonin in adult and fledgling American Kestrels (*Falco sparverius*) during short-term (one breeding season) and long-term (two breeding seasons) breeding behaviours, and compared the results to observed changes in body mass (FernieBird and Petitclerc, 1999). The study included kestrels subjected to EMF effects and a control group of kestrels (56 pairs in all) against which results could be compared. They found that EMFs affected plasma melatonin in male kestrels, by suppressed plasma values at 42 days and elevated plasma values at 70 days of EMF exposure. The 42 day melatonin levels in EMF males were the same levels as 70 day control males, suggesting a seasonal phase-shift in melatonin profile due to EMF exposure (FernieBird and Petitclerc, 1999). Melatonin levels were also suppressed in long-term fledglings but not short-term fledglings or females. They propose higher levels of melatonin in male kestrels than females may affect the sexually different results to EMF exposure. Results found that melatonin levels were not correlated to body-mass in American Kestrels and it was considered likely that results returned by the study are relevant to wild raptors nesting within EMFs (FernieBird and Petitclerc, 1999).

Fernie et al (2000a) observed that although there was documentation of reduced avian reproductive success when associated with power lines, such impacts had not been directly attributable to EMFs. They also noted that while laboratory studies had been undertaken to determine the effects of EMFs on embryonic development, such studies were unable to test the effects of EMFs on other factors that affect breeding success in wild birds, such as fertility, egg size, hatching, and fledgling success (Fernie et al., 2000a). In response, they undertook a study to determine the effect of EMFs on the reproductive success on birds, using captive American Kestrels (Falco sparverius) over two consecutive annual breeding seasons. The kestrels were separated into separate control and EMF effect groups (Fernie et al., 2000a). EMF exposure was set to the same levels as would be experienced by wild breeding kestrels and weakly correlated with a

reduction in egg laying in only the first year (Fernie et al., 2000a). In both breeding events pairs subjected to EMF exposure, experienced higher fertility and lower hatching success than control pairs (Fernie et al., 2000a). Fledgling success was higher for EMF subjected pairs than control pairs in only one of the breeding events. In a single year when egg composition and embryonic development were examined, eggs were larger, with more yolk, albumen, and water, but exhibited thinner egg shells than control eggs (Fernie et al., 2000a). Late-term EMF embryos were larger and longer than control embryos, although hatchlings were similar in body mass and size (Fernie et al., 2000a). For their study Fernie et al (2000a) found that there was a different result in reproductive success in EMF exposed kestrels, resulting in increased fertility, egg size, embryonic development and fledgling success and reducing hatching success when compared to control kestrels.

Fernie et al (2000b) note that wild birds particularly raptors use electrical transmission infrastructure for perching, hunting, roosting nesting, and consequently are exposed to EMFs. They determined the time periods wild American Kestrels (*Falco sparverius*) were exposed to EMFs from 735-kV power lines, so that the effect of EMFs on the behaviour of captive breeding kestrels could be studied (FernieLeonard and Bird, 2000b). During their study they found that wild kestrels were exposed to EMFs for 25% to 75% of the observation periods. Over a 24 hr period, it was estimated that EMF exposure to wild kestrels ranged from 71% during courtship, to 90% during incubation, which was comparable to the exposure figures (88%) that captive breeding kestrels were subjected to (FernieLeonard and Bird, 2000b). The results found that captive female EMF kestrels exhibited increased activity and alertness, and, in comparisons to control females, perched more often on the pen roof. EMF female kestrels were observed to preen and rest less often during the rearing of their broods (FernieLeonard and Bird, 2000b). As with female EMF kestrels, male EMF kestrels were observed to be more active than control males during courtship, and more alert during incubation (FernieLeonard and Bird, 2000b). The observed behavioural changes in breeding EMF kestrels were unlikely to contribute to increased growth of nestlings or increase the survival rates of fledglings, or reduce hatching success, though previously reported as such (FernieLeonard and Bird, 2000b). Fernie et al (2000b) note that behavioural changes observed in captive EMF kestrels may be observed in wild kestrels.

Fernie and Bird (2001) observe that exposure to EMFs alters melatonin, behaviour, growth, and reproduction of captive American Kestrels (*Falco sparverius*), particularly males. Therefore, they undertook a study to determine whether EMF exposure triggers an avian immune response and alters oxidative stress levels. Captive kestrels were bred under control or EMF conditions at levels similar to those wild kestrels are subject to (Fernie and Bird, 2001). They found that short-term (single breeding season) exposure to EMFs suppressed plasma total proteins, hematocrits and carotenoids in the first half of the breeding cycle, as well as suppressing erythrocyte cells and lymphocyte proportions at the end of the breeding season (Fernie and Bird, 2001). Long-term (two breeding seasons) studies also resulted in a suppression of hematocrits in the first half of the reproductive period (Fernie and Bird, 2001). The study deduced that the elevation of granulocytes, and the suppression of carotenoids, total proteins, and previously melatonin in the same kestrels, signified that the short-term EMF male kestrels had higher level of oxidative stress, due to an immune response and/or EMF exposure and that long-term EMF exposure may be linked to higher levels of oxidative stress through EMF exposure alone (Fernie and Bird, 2001).

In a study conducted over nine (9) breeding seasons, Tomas et al (2012) note that within a single population of Great Tits (*Parus major*), breeding occurrences subjected to the effects of EMF exposure showed an increase in clutch size (7%) and an increase in egg volume (3%) (Tomas et al., 2012). Although the study showed that there was an increase in both clutch size and egg volume the overall average productivity as a function of fledgling and reproductive success, including nestling body mass, did not exhibit any change (Tomas et al., 2012). In comparison to Great Tit breeding events not associated with artificial EMF influences, researchers noted Great Tit breeding events subjected to artificial EMFs influences realise the same breeding success, but with a greater expenditure of energy resources (Tomas et al., 2012).

J4 Power transmission line bird strike

Bernardino et al. (2018) observe that growing global energy demands are causing worldwide increases in electrical infrastructure, representing significant negative impacts to biodiversity, predominantly birds. They undertook a systematic review of available literature, dealing with bird power line related collisions, with attention to specific areas of previous research, including:

- an assessment of overall trends in scientific research in recent decades
- a review of existing knowledge of bird collision factors, as well as their effectiveness in reducing collision risk; including:
  - species-specific factors (e.g. vision, morphology)
  - site-specific factors (e.g. topography, light and weather conditions, and anthropogenic disturbance), and
  - power line-specific factors (e.g. number of wire levels, wire height and diameter)
- an evaluation of existing mitigation measures (e.g. power line routing, underground cabling, power line configuration, and wire marking), as well as their effectiveness in reducing collision risk (Bernardino et al., 2018).

The Bernardino et al. (2018) review concluded:

- there is a general paucity of specific scientifically tested information regarding factors leading to bird power line collision
- there are few studies conducted in Asia, Africa, and South America; and
- several suggested methods of good practice were not at the time of publication, supported by scientific evidence.

Gap analysis undertaken by the Bernardino et al. (2018) study identified three key directions for future research, innovation, and scientific testing of current impact avoidance methodologies:

1. Bird behaviour – including the use of data loggers and sensors.
2. Impact assessment – the identification and understanding of specific drivers at mortality hotspots, assessment of population-level impacts, development of methods for automatic detection of bird impacts.
3. Mitigation measures – outlining a greater need for BACI (Before-After-Control-Impact) level studies to determine the effectiveness of different wire-marking/bird avoidance devices and strategies (Bernardino et al., 2018).

They conclude by observing that, globally, the predictiveness and effectiveness of bird power line impact and mitigation, is compromised by a general lack of understanding about the regionally specific complexity of bird ecologies and how they interact with different collision drivers (Bernardino et al., 2018).

In a review of 14 studies, qualified by specific inclusion criteria, Loss et al (2014) estimated that between 12 and 64 million birds are killed each year in the United States (U.S.) through power line associated fatalities. Eighty-nine percent (89%) of the bird fatalities were attributable to collision mortality, the remaining eleven percent (11%) were caused by electrocution (LossWill and Marra, 2014). Variations in mortality rates were a product of the relatively small number of rigorous studies available that deal with the study of bird mortality (LossWill and Marra, 2014). The review found that while there is a general dearth of studies, and most were limited in scope (relating to diversity of species, habitat types and locations), the data collected showed that bird mortality associated with power lines in the U.S. is substantial and requires conservation management and policies to lower mortality rates (LossWill and Marra, 2014).

J5 Power transmission line impacts and the proposal

J5.1 Collision risks

J5.1.1 Alignment geographical context

The alignment commences at Dinawan at its eastern extremity and traverses west southwest to the south of Mabins Well, Steam Plains and crosses Willurah Road south of Willurah and the Cobb Highway north of Wanganella. It continues west to the Moulamein area and turns south through Cunninyeuk to the Murray River near Murrabit in Victoria.

The subject land occurs in south-western NSW across the Murrumbidgee and Murray Fans IBRA subregions.

The landscape through which the alignment traverses is very flat, with much of it cleared or managed for agriculture, and native forested communities are largely associated with riparian contexts, several of which are traversed by the alignment.

There are no mountain ranges associated with the landscape in which the alignment occurs, but it occurs in a landscape that contains the major river systems of the Murray, both to its south, and at its completion, and the Murrumbidgee more distant to the north. While the alignment traverses country that is largely distant from the major water courses of the Hay Plain it traverses many tributaries, lakes and depressions that are subject to periodic inundations. Those inundation events often represent important foraging and sometimes breeding opportunities for nomadic and migratory bird species.

The region through which the alignment traverses roughly surrounds Deniliquin through the southern portions of the Hay Plain. At its closest extent, Deniliquin occurs some 45 kms south of the alignment's central sections and occurs ~92 km southwest of its commencement and ~100 km east of its completion respectively. Therefore, weather statistics from Deniliquin largely approximate the weather conditions experienced by the landscapes through which the alignment traverses.

At Deniliquin Airport weather records report that January is the warmest month with a mean maximum temperature of 33.3ºC and a mean minimum 16.7ºC. July is its coolest month with a mean maximum temperature of 14.4ºC and a mean minimum of 3.3ºC. Generally, the summers are hot, and the winters are cold. Spring and Autumn are relatively mild in temperature and the highest average rainfall period generally occurs from late winter through spring to early summer.

Through its course it traverses locations where a range of habitats frequented by birds occur, notably, many associated with water. The range of wetland habitats occurring adjacent (near and more distant) vary considerably in their extent, access and permanence. Critical in determining the levels of risk infrastructure might represent to birds within the landscape, are habitat types and the birds they attract, their proximity to the alignment and their permanence.

J5.1.2 Alignment description and wetland habitats

A general description of locations where wetland habitats are associated with the alignment is given below in a review of its course through the landscape.

The alignment commences at its eastern extremity near the Dinawan substation, around the eastern extremity of the Delta Creek drainage area on the eastern side of Kidman Way. From its commencement it traverses west across Kidman Way then turns northwest to follow an unsealed track in a west south-westerly heading. It runs roughly parallel to the meandering Delta Creek to Carrathool Road skirting the eastern extremity of the Steam Plains section of South West Woodland Nature Reserve. It continues west southwest for around 10 km and turns west northwest to follow unsealed tracks across Willurah Road, skirting north of the meandering Delta Creek. Continuing west it traverses a mosaic of ephemeral depressions and small lakes including Dillons Swamp on the eastern side of the Cobb Highway.

From the Cobb Highway it turns northwest to cross the Coleambally Outfall Drain then turns west southwest below a cluster of ephemeral depressions then continues west southwest across Maude Road to pass south under The Forest Creek around 5 km south of Lake Lyle. The alignment then crosses Balranald Road and the Edward River before turning south to cross Swan Hill Road and, in turn, the Northern Branch Canal, Yarrein Creek and then the Mallan Branch Canal. The alignment's southern path follows Pike Pike Lane to the east of the highly ephemeral Lake Nangtree and approximately 5 km west of Mortons Lake.

The alignment continues south through Black Box communities to cross the Niemur River and to its south Wood Lane, and the forested Cunninyeuk Creek. It then continues south through rural landscapes across the ephemeral Magpie Creek to Cunninyeuk Road, following its southeast orientation before turning southwest to cross the Black Box communities associated with the Murray Valley National Park – Wetuppa State Forest associated with the Wakool River. The crossing passes through broken landscapes at a point where clearing for the alignment minimises the loss of native woodland communities.

It then continues southwest to cross Larry's Creek before turning southeast to follow an unsealed rural road, through Black Box Woodland, skirting ephemeral wetland habitats and crossing Larry's Creek again. The alignment then continues southeast along the path of the unsealed rural road through rural lands spanning an ephemeral depression (in a pastoral paddock) and an associated creek-line before Black Box Woodlands associated with Noorong Road and another ephemeral wetland (again occurring in a pastoral paddock).

The alignment then turns to the south southwest through pastoral lands to cross Murrabit Road and the billabongs of Bullockhide Creek. Aerial mapping shows that pastoral lands associated with the alignment through this area are subject to inundation and may provide ephemeral habitats for waterbird species that are prone to respond to flooding events.

The alignment continues in a southerly direction through pastoral landscapes characterised by scant stands of trees before reaching the end of its NSW alignment at the Murray River.

J5.1.3 Migratory and nomadic birds

Australia provides important seasonal and stochastic weather derived resources for many bird species from a range of bird groups. International migrant wader species, many from the northern hemisphere, visit Australia during the austral summer, with some age cohorts overstaying the austral winter, while some New Zealand bird species visit Australia during the austral winter to escape New Zealand's cooler winter conditions.

Many passerines which breed in southern Australia, winter in northern Australia and New Guinea where food is more readily available during the winter months.

Large numbers of resident water birds are attracted to the ebb and flow of water levels between regional and state level distributions, which often entail long-distance movements to and from ephemeral wetlands, including those that occur to the north and south of the proposal study area. Apart from resident waterbirds, large numbers of international migratory shorebirds also respond to such variations in water availability during their seasonal occupation of Australian habitats.

Apart from migratory movements, many birds move regionally or within their established territories during the seeking of food or for territorial defence.

Not all movements by birds are undertaken during the day as some birds move non-stop for days, as is the case with international migrants, and others move at night to avoid predators and extreme temperature. A number of waterbirds and shorebirds have been observed to undertake movements from one wetland habitat to another during nocturnal hours (Richardson, 2016a). During winter occupation of the Hunter River estuary, migratory wading birds were observed to move equally during day and night periods, as a response to the availability of foraging areas and the need to access roosting areas during high tide levels (Richardson, 2004). Long distance movements, representing 1,000's of kilometres, by a number of shorebird species take place continuously without breaks throughout nocturnal and diurnal hours (Battley et al., 2012). McEvoy (2015) observed that long distance movements undertaken by radio-tracked South Australian Pacific Black Ducks, in response to moderate to high rainfall events, were almost exclusively undertaken during nocturnal hours (McEvoy, 2015). During McEvoy's (2015) Pacific Black Duck study, reasons for nocturnal movements

could not be clearly determined, although avoidance of diurnal avian predators, which are key predators of waterbirds and shorebirds, were cited as a likely incentive to avoiding long distance movements during the day (McEvoy, 2015). Birds of prey were observed to be the major predatory risk for diurnal shorebirds in a study of wintering shorebirds in the Hunter River Estuary (Richardson, 2004, Richardson, 2016c).

Considering the orientation of the alignment from east to west, it likely intersects flight lines between inland and coastal wetlands. As such, there is a likelihood that large numbers of waterbirds would periodically cross the alignment from south to north and back again, often during nocturnal hours. This suggests that an increase in the number of power lines in the landscape may realise an increase in potential for bird strike.

Other groups of birds prone to nomadic movements are also likely to be at risk of collision, such as the larger birds of prey. While possessing excellent eyesight, birds of prey are at risk of power line strike because of their potential to strike obstacles before them when searching the ground for prey and the location of power lines within elevations where they fly.

While most birds of prey are not usually migratory, many periodically move in relation to variations in productivity (i.e. prey availability). Birds of prey respond by moving to areas where greater productivity increases survival and breeding-cycle success. The larger birds of prey, with some of the largest wingspans (WS) of Australia's birds, have been observed in habitats associated with the alignment, or are considered likely to occur in its vicinity from time to time, include; Wedge-tailed Eagle (WS~2.8 m), Square-tailed Kite (WS~1.3 m), Little Eagle (WS~1.3 m), Spotted Harrier (WS~1.2 m) Black Kite (WS~1.2) Whistling Kite (WS~1.2), Brown Falcon (WS~1.2), Peregrine Falcon (WS~0.95), Australian Hobby (WS~0.9) and Nankeen Kestrel (WS~0.8) (Pizzey and Knight, 2012).

While it is highly likely that some bird species, within collision risk bird groups, would be at lesser risk of collision than others (LossWill and Marra, 2014), a proportion of different migrating or nomadic bird species are likely to be impacted by the introduction of additional infrastructure into their flight paths.

Refer to section J7 for a risk assessment for the most relevant migratory and nomadic threatened bird species for the project. Threatened migratory species highlighted as being at moderate to high risk in section J7 include Magpie Goose, Dusky Woodswallow, Curlew Sandpiper, Brolga and Australian Painted Snipe.

J5.1.4 Resident birds

A substantial proportion of birds that occur in territories in the subject land, will not be at risk of power lines strike, since their use of habitat never extends to open areas especially at elevations where power lines are located. Nevertheless, there are some groups of resident birds that favour open areas, which are at increased risk of collision, because power lines occur in the habitats they often frequent. Although resident birds around the alignment footprint are likely to quickly adapt to changes made within their well-known territories, new infrastructure represents an increase in hazardous obstacles with which some groups might collide when distracted by high priority activities, such as hunting, territorial defence, breeding behaviours and learning to fly.

As noted above, a proportion of local birds are unlikely to be placed at risk of collision since their habits do not extend to the open elevated habitats where greater risk of collisions occurs. Large areas of the alignment are associated with either open country or managed understories associated with the new alignment and adjacent infrastructure, where the flight lines of small to small-medium sized birds are much less likely to intercept power lines and for such species, the chances of impact are considered unlikely.

Tall vegetation communities where canopies are dominated by taller forest trees, such as River Red Gum communities along major river system are areas most likely to represent higher risk for smaller resident woodland bird guilds, although their lower flight speeds and sedentary behaviour reduce collision risks for many in this group.

Those birds considered as species to be of higher collision risk include local birds that fall into the larger and higher-flying bird categories, and which and which also reside over larger territories, such as birds of prey, ravens and magpies, cockatoos and some parrots, waterbirds, and waterfowl.

Refer to section J7 for a risk assessment for the most relevant resident threatened bird species for the project. Threatened species highlighted as being at moderate to high risk in section J7 include Australasian Bittern, White-bellied Sea-Eagle, Little Eagle, Pink Cockatoo, Square-tailed Kite, Blue-winged Parrot, Blue-billed Duck, Superb Parrot and Freckled Duck.

J5.1.5 Specific risks

Terrestrial birds

The alignment traverses a range of different terrestrial habitat types, which fall into two broad categories: those with treed canopies and those that are of an open nature with no treed canopies. Terrestrial birds occur widely across all terrestrial habitats associated with the alignment and largely fall into three habitat frequenting groups: those that frequent woodland habitats to the exclusion of other habitat types, those that frequent open habitats to the exclusion of other habitat types, and those that frequent both woodland habitats and adjacent open habitats. As addressed above, most smaller classes of terrestrial bird, whether open country or wooded country birds are unlikely to use powerline infrastructure beyond perching on the lower struts of towers. Smaller open country birds forage and breed in available grassy or shrubby understorey strata, often displaying aerially at elevations that are usually below conductor cabling. As such the smaller open country and wooded country birds are very unlikely to be significantly affected by the installation of the electrical infrastructure itself.

Larger terrestrial birds like magpies, corvids and birds of prey, occur across both wooded and open habitats, but are usually limited by the lack of trees for nesting opportunities in open habitats. However, such species are enabled to use large areas of open habitats whenever there are elevated nesting opportunities. Natural habitat features that enable such species to use open habitats are taller vegetation types/elements such as trees, even when they are widely spaced in the landscape. The lack of elevated nesting structures in naturally open areas, preclude the use of such habitats by bird species preferring elevated nest sites. However, the introduction of electricity transmission towers, enables these species to colonise naturally open habitats that are not naturally subjected to their influence. The installations of transmission towers which offer nesting opportunities for larger bird species may facilitate the introduction of such species into open habitats, which is likely to have negative flow on effects to small open country bird species such as quails, pipits, songlarks, chats, fairywrens, wintering parrots including Blue-winged Parrots and even threatened open country birds such as the Plains-wanderer, by the introduction of predatory birds.

Waterbirds

Waterbirds encompass a diverse range of bird species groups including, waterfowl (ducks and swans), plovers, sandpipers, snipe, terns and gulls, rails and hens, herons and egrets, ibis and spoonbills, cranes and a range of small aerial birds such as swallows and martins which feed on the insects attracted by water. Water habitats across the landscape in which the alignment traverses are highly variable structurally, and include large rivers and smaller creeks, lakes, depressions, swamps and in some areas gilgais. Due to the variability of topographic contexts in which the project occurs, wetland habitats are very variable in their capacity to retain water. Large rivers, such as the Murray River generally retain water continually, while small depressions may only hold water for days. Therefore, risk to waterbirds from powerline strike will be a function and scale of water presence in the landscape and how close powerline infrastructure occurs to wetland habitats. While many waterbird species may not fly at elevations that would naturally pose power lines as a risk to them when they travel long distances during migration or nomadic movements, wetland habitats close to power lines represent the greatest risk to waterbirds. The presence of water close to power lines increases collision risks to birds, as they are encouraged by the water to ascend or descend through powerline elevations.

The alignment occurs in relatively close proximity to a number of permanent lakes and ephemeral depressions and creeks, which may encourage waterbirds to descend to them through powerline elevations. However, risk levels will be strongly determined by the presence of water in the landscape and its return rates. Return rates are the periods of time where water bodies and drainage lines are dry between filling episodes by rainfall or flood events. In respect to the significance of water return rates and their effects on waterbirds, in the Australian context, including the landscape within the subject land traverses, it can mean that the availability of habitat opportunities for waterbirds in inland areas may only

occur at frequencies measured in years, sometimes decades. Large areas of the Hay Plain were completely inundated in the spring of 2022 and the previous event of that magnitude was recorded in 1974 and then back in the 1930's. Therefore, the return rate of water in the landscape moderates the risk waterbirds may be subjected to across time and has a strong influence on the level of impact a development may have on waterbirds that are only present when water is abundant in the landscape.

J5.2 Mitigation of collision risks to birds

Power lines represent a collision risk to birds, because in many cases, they occur within spaces where they do not expect to encounter obstacles.

Due to their relatively narrow/linear profile, power lines easily blend in with the landscape or are obscured by lighting conditions. Difficult light conditions can be caused by high contrast light at the beginning and end of the day and low contrast caused by fog, rain or darkness, all of which obscure the presence of power lines or make them appear much further away. Therefore, key strategies for reducing the numbers of birds striking power lines is making power lines more visible to birds.

Mitigation measures employed in areas where birds are at greater risk often take the form of large bright beacon-like objects to make birds aware of the presence of power lines. Referred to as diverters, a significant body of research has indicated that these visual aids reduce bird collisions with powerlines. Such devices are most effective for large bodied, low manoeuvrable birds, like swans or raptors, as collisions due to low visibility is a common cause of mortality. In contrast smaller fast-flying birds are at risk of collisions due to a range of behaviours such as flocking panic and require more varied mitigations.

Generally, bird diverters have shown a moderate to high effectiveness range with some studies showing an overall 47% reduction in observed casualties (Barrientos et al, 2012). Even though some studies have been hampered by inconsistent experimental designs and mixed results, due to limited scale and thereby reducing statistical significance in selected papers, the consensus with the majority of studies (Bevanger et al , 2001; Galis et al, 2019, Juan et al, 1994, Frost, 2008, Verbelen, 2024) found that although bird diverters don't completely eliminate collisions, they are recognised in the industry as the main mitigation method for reducing bird strike incidences.

There are many available designs and applications of bird diverters that have been studied for their effectiveness. These types include:

1. Spirals – Features a static brightly coloured wrapped coiled wire design. The most commonly used diverter globally for its relatively low cost and maintenance.
2. Flappers – Dynamic hanging panels that move in the wind and often feature contrasting colours and/or reflection.
3. Static markers – Flat non-moving shapes with contrasting bright colours and reflection.
4. Glow/UV – UV coating or glow-in-the-dark designs to be utilised when conditions are dark or during the night.
5. Marker Balls – Large plastic balls attached to the wire that can be used in combination as aviation diverters.

The flapper or "firefly diverter" line makers have been proven to outperform the alternate options as line detectivity is improved by the dynamic reflective features. The effectiveness of flapper designs show a statistically significant 70% reduction in bird mortality in comparison to the non-significant common spiral design with 40–45% reduction (Ferrer et al, 2020). Similar findings by the Raptor Protection of Slovakia (Galis et al, 2019) have shown moving-type diverters were more effective at protecting birds from strike than coloured spiral type diverters which are static. They note that high contrast diverters, which flap and/or twirl in the breeze, and are constructed of luminous material (visible at night) are the most efficient at catching the eye of birds and reducing impacts (Galis et al, 2019). They also report that some areas in Germany experienced collision reductions of up to 90% when using such diverters.

In Germany, Hungary and Slovakia, significant impact avoidance results were also returned using high contrast black and white diverters (Galis et al, 2019).

Although research indicates that flapper diverters have performed the best overall, the product implementation needs to be site specific to light conditions and surrounding landforms etc. (Ferrer et al, 2020). Furthermore, the design should also consider specifications to the bird species most likely to have interactions with powerlines and flight patterns correlating with wetland habitats (Ferrer et al, 2020).

J5.3 EMF and electrocution risks

J5.3.1 Migratory and nomadic birds

Even though some species of migratory birds are electrocuted when they collide with power lines, it is most likely that many of these incidents are associated with smaller power line infrastructure, or installations where individual conductors and earth potentials are close together, such that birds have the potential to touch multiple components of different electrical potential. For birds moving through the alignment, it is considered unlikely that birds would be at high risk of electrocution, as electrocution would require contact with different phases or conductor potentials, and the horizontal separation between individual conductors, or bundled conductors, exceeds the wingspans (WS) of all birds, including the largest migratory birds, such as; Brolgas (WS~2.4 m), Pelicans (WS~2.4–2.6 m), Black Swans (WS~2.0 m) and Australian Shelduck (WS~1.2 m) (Pizzey and Knight, 2012). Separation distances between tower arms and conductors achieved by insulators are shorter than between different conductors (7,200 mm and smaller designs 5,700 mm), but the separation, at 3,720 mm, is beyond the wingspans of all the world's birds. Large bird species are at a greater risk of collision impact injuries, than electrocution, due to their size and flight speed.

The other group of nomadic birds of sufficient sizes to be at risk of electrocution are the larger birds of prey, although as with other large bird species their wing spans are not sufficient to reach between different conductors or from conductors to conductive tower components. While most are not migratory many periodically move in relation to variations of ecological productivity, since dryer and wetter periods drive increases and lulls in resources, and birds of prey respond by moving to areas where greater productivity increases survival and breeding-cycle success. The larger bird of prey species observed in habitats associated with the alignment, or are considered likely to occur in its vicinity from time to time, include; Wedge-tailed Eagle (WS~2.8 m), Square-tailed Kite (WS~1.3 m), Little Eagle (WS~1.3 m), Spotted Harrier (WS~1.2 m) Black Kite (WS~1.2) Whistling Kite (WS~1.2 m), Brown Falcon (WS~1.2 m), Peregrine Falcons (WS~0.95 m), Australian Hobby (WS~0.9 m) and Nankeen Kestrel (WS~0.8 m) (Pizzey and Knight, 2012). All bird of prey species display wingspans that are well below the smallest separations between conductors and other conductors, or potential earthing infrastructure components.

Although some birds of prey undertaking dispersive or nomadic movements may occasionally land on powerline infrastructure, under such circumstances they are unlikely to be sufficiently affected by EMFs to any significant effect. Nevertheless, birds of prey, which are resident in habitats associated with the alignment, are part of the group of birds which are most likely to experience longer periods of exposure to EMFs because they often use the infrastructure for perching, and more importantly, they often use the infrastructure for nesting, particularly in open habitats. While there are areas where the subject land occurs within areas where woodlands and forests are present and offer an abundance of nesting alternatives to electricity infrastructure, for the most part such opportunities are absent from the landscape, and electrical infrastructure offer the most available nesting opportunities for such species.

J5.3.2 Resident birds

Those birds that occur as residents in the habitats surrounding power line infrastructure are the subset of all birds that will have to live with power transmission infrastructure for a good portion, if not all, of their lives. However, for many of the birds that live in close association with such infrastructure the greatest risk is loss of habitat during the construction phase of the project. Providing sufficient habitat has been retained for them to survive after the infrastructure's installation their behaviour will continue largely as it did prior to construction. A range of small birds that prefer the cover and foraging opportunities that the foliage of trees and shrubs offer will never ascend to the powerline region of the installation or use the bottom of towers for perches.

Those species most likely to ascend to power lines and the tops of towers are those species that are tolerant of open spaces, and which habitually fly at those elevations and above. The most likely resident birds to use powerline infrastructure are large passerines like ravens and crows, birds of prey preferring open habitats, and aerial foraging species, such as woodswallows, swallows and martins, and dollarbirds and bee-eaters. Although magpies will use power lines, they forage on the ground and, when available, prefer perches and nesting locations with the added cover of trees. Often the height of high transmission lines is too high for them, and the same extends to smaller aerial foragers, much of the time, which also prefer to perch low when foraging close to the ground. Nevertheless, magpies and the corvids (ravens and crows) do use towers for nesting purposes when there are no other elevated options to build their nests.

Although there is a small group of birds for which transmission towers are preferable for nest building, including ravens and crows, and medium to large birds of prey, in the landscapes surrounding the subject land there are ample natural nesting opportunities, which are more likely to be used by these species than transmission line infrastructure. No nests in powerline infrastructure were observed during field work carried out throughout the subject land by a wide range of field personnel, but it is considered likely that large birds from the group described above may occasionally use infrastructure where there are limited natural options.

There is a small group of birds for which transmission towers are preferable for nest building, especially in open country with an absence of trees, which include the corvids, medium to large birds of prey and, in some areas, storks and cranes. Many nests located in the top of transmission line towers have been observed during field surveys on the Hay Plain, although not all could be assigned to species. Most nests were in the size range as built or used by magpies or corvids and medium sized birds of prey, although due to the longevity of nests, it isn't always the builders that utilise the nests in subsequent breeding seasons. Several nests of sufficient size to be built by Wedge-tailed Eagles or Black Falcons, some active, have been observed on existing transmission line towers to the north on the Hay Plain (WSP Ecologists pers. obs.), and a pair of Peregrine Falcons were observed using a tower in an existing easement in mallee country north of Buronga for nesting, and were raising young at the time of observation (WSP Ecologists pers. obs.).

When there are limited natural nest site opportunities, it is such species that have the greatest risk of EMF effects, due to their familiarity with infrastructure and extended periods in relatively close proximity to conductors. Most towers are designed to minimise their use by birds, however the benefits of power infrastructure to bird behavioural priorities make some individuals determined to use such structures across locations where elevated nest sites in old growth trees are limited.

In assessing the types of large transmission towers likely to be used for the project, the dimensions of transmission tower structures were considered. The minimum distance from conductors to earthed infrastructure that birds might build nests on is 3,930 mm, and greater than the wingspans of the largest Australian birds. If a nest is built on an arm with a conductor above it, the height of the nest and the bird will reduce that figure.

The period chicks occupy the nest from the laying of the egg to leaving the nest has been added below for the birds of prey most likely to occur. For all these species the nest is not usually occupied outside the breeding period.

The largest Australian bird of prey occurring in the alignment locality is the Wedge-tailed Eagle, which has the longest incubation and nestling periods of Australian birds of prey with a maximum incubation period of 45 days, and maximum nestling period of 85 days. The maximum nest occupation time for this species, from egg laying to departure, is around 130 days (~19 weeks).

For the next largest group of birds of prey (size wise), including species such as Black-breasted Buzzard, Little Eagle, Square-tailed Kite and Spotted Harrier, the incubation periods are around 40 days and nestling period around 60 days. The maximum nest occupation time for these species, from egg laying to departure, is around 100 days (~14 weeks).

Nest occupancy periods for smaller birds of prey from medium sized birds, such as Whistling Kites and Black Kites (~83 days), reduce progressively with size through the Pacific Baza and Falcons, down to the smallest, represented by the Nankeen Kestrel, which has an incubation period of 29 days and a nestling period of 35 days, representing a total nest occupation time of 64 days (~9 weeks). The corvids will fall into a group that is smaller than the kites and largest falcons.

From data derived from a range of studies, it is considered likely that EMFs may influence the physiology of birds nesting on transmission towers. However, the levels of those effects to each species under all different conditions is not easily quantifiable and there is currently no conclusive evidence that such effects would have a significant effect on the long-term viability of local bird populations.

J5.4 Mitigation of EMF impacts to birds

Mitigation for EMF impacts are best implemented by tower designs that discourage birds from building nest on them. As it is an important priority for managers maintaining power transmission lines to ensure that nesting birds do not constitute a risk to power delivery, towers being considered are currently designed to discourage their use by birds, which also reduces the numbers of birds which may be affected by EMFs to a minimum.

J6 Conclusions and recommendations

Based on the available research, the following conclusions on potential impacts have been reached:

- The bird species considered to be at higher risk of collision include local birds that fall into guilds of larger and higher-flying birds, and which reside over larger territories. These birds include birds of prey, ravens and magpies, cockatoos and some parrots, waterbirds, and waterfowl.
- It is likely that EMFs may influence the physiology of birds nesting on transmission towers. However, the levels of those effects to each species under a range of different conditions is not easily quantifiable and there is currently no conclusive evidence to suggest that such effects would have a significant effect on the long-term viability of local bird populations.

Management and mitigation measures proposed consist of the following:

- Line markers, otherwise known as “diverters” are well known throughout the world to be an effective mitigation strategy to warn birds of the presence of power lines and will be included in the project design. Proposed bird diverter zones are included in Figure 15.16 of the BDAR.
- Towers will be designed to discourage nesting to reduce both potential collision and EMF impacts.
- Table 9.22 of the BDAR provides a summary of proposed mitigation and management measures for residual impacts (direct, indirect and prescribed). This includes a Biodiversity management subplan (BMP) and Biodiversity Impact Monitoring Plan (BIMP) to monitor, verify and report on biodiversity impacts and mitigation effectiveness for the project.

These commitments will ensure that impacts from the project as a result of strike will be minimised, managed and monitored (including adaptive management) from construction through to operational phases.

J7 Bird collision likelihood assessment

Legend

		Records within 50 km of proposed alignment	Sedentary = 1 Migratory/ dispersive = 1 Local wetland flights = 3	Not present = 0 Rare = 1 Moderate = 2 Common = 3	< Canopy height = 0 >Canopy <Powerline Height = 1 Powerline height = 3 +>Powerline height = 0	Low </= 3 Moderate = 4 – 5 High = >/=6	PCTs

Scientific name	Common name	Records within 50 km of proposed alignment	Flight movement type	Population size occurrence average	Typical flight pattern	Likelihood of collision	PCT habitats
Anseranas semipalmata	Magpie Goose	Y	1 and occasionally 3	1	1	<5 – Moderate – As with other waterfowl their greatest risk of powerline strike occurs when wetland access is associated with obstacles that they have to negotiate. Where power lines occur close to wetlands the risk of waterfowl strike increases. Few records of this species so overall risk is moderate.	15, 24, 45, 47, 53, 160, 163
Anthochaera phrygia	Regent Honeyeater	Y Barham Deniliquin	1	1	0	2 – Low – Movements occur below the canopy and are limited to woodland habitats associated with the subject land.	Species excluded from assessment due to no mapped important habitat for this species in the subject land (see section 5.1.1 of the BDAR).

Scientific name	Common name	Records within 50 km of proposed alignment	Flight movement type	Population size occurrence average	Typical flight pattern	Likelihood of collision	PCT habitats
Aphelocephala leucopsis	Southern Whiteface	Y	1	2	0	3 – Low – A ground foraging species that breeds in hollows of trees and flies at low elevations.	277, 266
Ardeotis australis	Australian Bustard	N	3	0	3	6 (0) – Low – No records within Bionet mapping or within 50 km of the subject land, species not present. *In regions where power lines traverse habitats where this species is confirmed to occur, it is likely to be risk of power line strike based on the elevations it is known to fly.*	11, 15, 24, 26, 28, 44, 45, 46, 53, 160, 163, 164, 216
Artamus cyanopterus cyanopterus	Dusky Woodswallow	Y Woodland throughout	1	3	0	4 – Moderate – Occurs throughout the area but risk reduced due to flight heights and rapid habituation to line presence and would likely use as perches on occasion.	2, 7, 10, 11, 13, 15, 17, 19, 22, 26, 28, 44, 45, 46, 47, 53, 58, 153, 157, 160, 163, 164, 166, 216, 237, 266, 277, 319, 343
Botaurus poiciloptilus	Australasian Bittern	Y	3	1	3	7 – High – Population records occur in the locality of the subject land, and a high risk is associated if power lines are close to wetlands and foraging habitats. This risk is heightened due to the species making local movements at elevations that may be similar to the powerline heights, between and around wetland habitats.	10, 11, 13, 17, 24, 160

Scientific name	Common name	Records within 50 km of proposed alignment	Flight movement type	Population size occurrence average	Typical flight pattern	Likelihood of collision	PCT habitats
Burhinus grallarius	Bush Stone-curlew	Y	1	1	0	2 – Low – movements below canopy and population is sparse.	7, 10, 11, 13, 15, 26, 28, 237, 343
Calidris ferruginea	Curlew Sandpiper	Y	1 & 3 (rarely)	1	0	<4 – Moderate – Records present in the region, likely limited to flooding events. Long distance movements are likely at high elevations, but this species is at risk if infrastructure is located close to wetlands, where descending birds may encounter power lines.	24, 53
Callocephalon fimbriatum	Gang-gang Cockatoo	N	1	0	1	2 (0) – Low – No regional records within Bionet mapping or within 50 km of the indicative disturbance area, species not present. *In regions where power lines traverse habitats where this species is confirmed to occur, it is likely to be at a moderate risk of power line strike when local vegetation occurs at power line elevations.*	343

Scientific name	Common name	Records within 50 km of proposed alignment	Flight movement type	Population size occurrence average	Typical flight pattern	Likelihood of collision	PCT habitats
Calyptorhynchus lathami	Glossy Black-Cockatoo	N	1	0	1	2 (0) – Low – No regional records within Bionet mapping or within 50 km of the indicative disturbance area, species not present. *In regions where power lines traverse habitats where this species is confirmed to occur, it is likely to be at a moderate risk of power line strike when local vegetation occurs at power line elevations.*	26, 53, 266, 237, 343
Certhionyx variegatus	Pied Honeyeater	N	1	0	0	1 (0) – Low – No Bionet records in NSW associated with the broader landscapes that the subject land occurs within. *In regions where power lines traverse habitats where this species is confirmed to occur, it is likely to be at a low risk of power line strike due to its preference for habitats with low vegetation.*	10, 11, 13, 15, 22, 24, 26, 28, 58, 153, 163
Chthonicola sagittata	Speckled Warbler	Y	1	1	0	2 – Low – Due to the species occurring below woodland canopies.	237, 266, 277, 319, 343
Circus assimilis	Spotted Harrier	Y	1	2	1	3 – Low – Due to limited densities and a general tendency to hunt for terrestrial prey.	2, 7, 10, 11, 13, 15, 17, 22, 26, 28, 44, 45, 46, 47, 53, 58

Scientific name	Common name	Records within 50 km of proposed alignment	Flight movement type	Population size occurrence average	Typical flight pattern	Likelihood of collision	PCT habitats
Climacteris affinis	White-browed Treecreeper (endangered population)	N	1	0	0	0 (1) – Low – Species excluded due to subject land not occurring within the endangered population distribution. *In regions where power lines traverse habitats where this species' threatened population is confirmed to occur, it is likely to be at a low risk of power line strike due to its preference for habitats with low vegetation.*	n/a
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	N	1	0	0	0 (1) – Low – In NSW the threatened subspecies of the Brown Treecreeper (*Climacteris picumnus victoriae*) does not occur west of Wagga Wagga. Therefore, the subject land does not occur in landscapes where this subspecies of the Brown Treecreeper occurs. *In regions where power lines traverse habitats where this species' threatened subspecies is confirmed to occur, it is likely to be at a low risk of power line strike due to its preference for habitats within canopy elevations.*	237, 266, 277, 343

Scientific name	Common name	Records within 50 km of proposed alignment	Flight movement type	Population size occurrence average	Typical flight pattern	Likelihood of collision	PCT habitats
Daphoenositta chrysoptera	Varied Sittella	Y	1	1	1	3 – Low – Due to the species occurring below woodland canopies and slow flight speeds.	2, 7, 10, 11, 13, 15, 22, 26, 28, 58, 237, 266, 277, 319, 343
Epthianura albifrons	White-fronted Chat	Y	1	2	0	3 – Low – Due to preference to open habitats and slow flight speeds.	17, 24, 44, 45, 46, 47, 53, 153, 157, 160, 163, 164, 166, 216
Falco hypoleucos	Grey Falcon	Y	1	0 No resident individuals in region	1	2 – Low – Due to general scarcity (sightings largely stochastic) and a general tendency to hunt for terrestrial prey. Species known to use transmission infrastructure for roosting and nesting. *In regions where power lines traverse habitats where this species is confirmed to occur, it is likely to be at a low risk of power line strike due to its preference for using powerline infrastructure.*	10, 11, 13, 15, 17, 19, 22, 16, 28, 44, 45, 46, 47, 53, 58, 153, 157, 160, 163, 164, 166, 216, 237
Falco subniger	Black Falcon	Y	1	1	1	3 – Low – Due to general scarcity and a general tendency to hunt for terrestrial prey. Species known to use transmission infrastructure for roosting and nesting.	13, 15, 24, 44, 46, 58, 157, 163, 164, 170, 216, 277
Glossopsitta porphyrocephala	Purple-crowned Lorikeet	Y	1	1	1	3 – Low – Was not present in Bionet regional data sets, but occasional records in eBird databases are present. Low due to general scarcity and habits limited to woodland canopies.	2, 7, 10, 11, 266

Scientific name	Common name	Records within 50 km of proposed alignment	Flight movement type	Population size occurrence average	Typical flight pattern	Likelihood of collision	PCT habitats
Glossopsitta pusilla	Little Lorikeet	Y	1	1	1	3 – Low – Was not present in Bionet regional data sets, but occasional records in eBird databases are present. Low due to general scarcity and habits limited to woodland canopies.	2, 7, 266, 277, 319, 343
Grantiella picta	Painted Honeyeater	Y	1	1	1	3 – Low – Due to general scarcity and habits limited acacia woodlands. Elsewhere in its range it prefers mistletoes, especially the Grey Mistletoes (*Amyema quandang*), which habitually parasitises acacias, including *Acacia pendula* whose range extends to west to Deniliquin and the eastern sections of the subject land.	2, 7, 10, 11, 13, 15, 26, 28, 58, 237, 266, 277, 319, 343
Grus rubicunda	Brolga	Y	1 and 3	2	3	6-8 – High – High risk if power lines occur close to wetlands and other foraging habitats such as pastures and tilled ground. Birds migrating north or south are likely to be at greater risk with power lines occurring across their movement regions.	7, 10, 11, 13, 15, 17, 24, 26, 45, 47, 53, 160, 163, 166
Haliaeetus leucogaster	White-bellied Sea-Eagle	Y	1	2	3	6 – High – High risk if power lines close to wetlands and foraging habitats.	7, 10, 11, 13, 15, 17, 24, 26, 28, 44, 45, 46, 53, 157, 160, 163, 164, 216, 237, 319, 343

Scientific name	Common name	Records within 50 km of proposed alignment	Flight movement type	Population size occurrence average	Typical flight pattern	Likelihood of collision	PCT habitats
Hamirostra melanosternon	Black-breasted Buzzard	N	1	0	1	2 (0) – Low – No records within Bionet mapping or within 50 km of the indicative disturbance area, species not present. Very rare occurrences cannot be entirely discounted during stochastic climatic events – may use power lines for perching or roosting. *In regions where power lines traverse habitats where this species is confirmed to occur, it is likely to be at a low – moderate risk of power line strike based on the elevations it is known to fly.*	7, 10, 11, 13, 15, 17, 28, 46, 58, 160, 163, 216
Hieraaetus morphnoides	Little Eagle	Y	1	2	3	6 – High – High risk due to flight heights but reduced due to familiarity with local habitat features.	7, 10, 11, 13, 15, 17, 24, 26, 28, 44, 45, 46, 53, 157, 160, 163, 164, 216, 237, 319, 343
Hirundapus caudacutus	White-throated Needletail	Y	1	1	1	3 – Low – Due to generally high flight heights and limited records in the region. Possible over all PCTs.	2, 7, 10, 11, 13, 15, 17, 24, 26, 44, 45, 46, 47, 53, 157, 160, 216, 237, 266, 277, 319, 343

Scientific name	Common name	Records within 50 km of proposed alignment	Flight movement type	Population size occurrence average	Typical flight pattern	Likelihood of collision	PCT habitats
Lathamus discolor	Swift Parrot	N	1	0	3	4 (0) – Low – No Bionet records in NSW associated with the subject land region. *In regions where power lines traverse habitats where this species is confirmed to occur, it is likely to be at a moderate risk of power line strike based on the elevations it is known to fly.*	7, 10, 11, 13, 15, 24, 26, 237, 319, 343
Leipoa ocellata	Malleefowl	N	1	0	1	2 (0) – Low – No Bionet records in NSW associated with the subject land and there are no mallee habitats associated with the subject land. *In regions where power lines traverse habitats where this species is confirmed to occur, it is likely to be at a low risk of power line strike based on the elevations it is known to fly.*	343

Scientific name	Common name	Records within 50 km of proposed alignment	Flight movement type	Population size occurrence average	Typical flight pattern	Likelihood of collision	PCT habitats
Limosa limosa	Black-tailed Godwit	N	1-3	1	3	5–7 (0) – Low – As with other waterbird their greatest risk of powerline strike occurs when wetland access is associated with obstacles that they have to negotiate. Where power lines occur close to wetlands the risk of waterbird strike increases. One record in eBird west of Tullakcool. This species, as with many long-distance migratory birds, may use ephemeral habitats in the region, particularly during stochastic flood events.	53, 166
Lophochroa leadbeateri	Pink Cockatoo	N	1	2	1	4 – Moderate – Records throughout the region. Flight heights are largely confined to local woodland elevations but also observed to fly at high elevations during longer movements, which represents some risk to local individuals.	7, 10, 11, 13, 15, 26, 28, 45, 163, 237
Lophoictinia isura	Square-tailed Kite	Y	1	2	3	6 – High – High risk due to flight heights but may be reduced due to familiarity with local habitat features.	7, 10, 11, 13, 15, 26, 28, 45, 237

Scientific name	Common name	Records within 50 km of proposed alignment	Flight movement type	Population size occurrence average	Typical flight pattern	Likelihood of collision	PCT habitats
Melanodryas cucullate cucullata	Hooded Robin (south-eastern form)	Y	1	2	0	3 – Low – Due to moderate population. However, the flight height of the species occurs under power lines.	2, 7, 10, 11, 13, 15, 19, 22, 26, 28, 58, 237, 266, 277, 319, 343
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	Y	1	1	1	3 – Low – Due to moderate population, and flight height occurring under power lines.	2, 7, 11, 237, 277, 319, 343
Neophema chrysostoma	Blue-winged Parrot	Y	1	1	3	4 – Moderate – Generally, uses more open habitats and forages at ground level, but often flies at higher elevations for local and more extensive movements.	2, 7, 10, 11, 13, 15, 17, 19, 22, 24, 26, 16, 28, 44, 45, 46, 53, 58, 153, 157, 160, 163, 164, 166, 216
Neophema pulchella	Turquoise Parrot	Y	1	1	0	2 – Low – Species records are limited to Deniliquin. Low risk due to low population, not using open country, and flights occurring within woodland and forest elevations.	237, 266, 277, 319, 343
Ninox connivens	Barking Owl	Y	1	1	0	2 – Low – Due to sparse population, and flight height is likely to be confined to woodlands at elevations below power lines.	7, 10, 11, 13, 15, 53, 237, 319, 343

Scientific name	Common name	Records within 50 km of proposed alignment	Flight movement type	Population size occurrence average	Typical flight pattern	Likelihood of collision	PCT habitats
Oxyura australis	Blue-billed Duck	Y	1 and occasionally 3	1	0	2–4 – Moderate – A specialist deep water species with local movements confined to low elevations within water bodies, but may fly at higher elevations during more extensive movements.	17, 160
Pachycephala inornata	Gilbert's Whistler	Y	1	1	0	2 – Low – The species occupies dense shrub layers for both foraging and breeding. No regular large-scale movements occur, and flights are common to be of low elevation.	10, 11, 13, 17, 19, 28, 58, 170
Pedionomus torquatus	Plains-wanderer	Y	1	1	0	2 – Low – Due to presence of the species within the vicinity of the subject land in Bionet records. However, the species is ground-dwelling and only occurs in grassland habitats.	44, 46
Petroica boodang	Scarlet Robin	Y	1	2	0	3 – Low – Due to moderate population, and flight heights occurring under power lines.	7, 11, 26, 266, 277, 343
Petroica phoenicea	Flame Robin	Y	1	2	0	3 – Low – Due to moderate population, and flight heights occurring under power lines.	7, 266, 277, 343

Scientific name	Common name	Records within 50 km of proposed alignment	Flight movement type	Population size occurrence average	Typical flight pattern	Likelihood of collision	PCT habitats
Polytelis anthopeplus monarchoides	Regent Parrot (eastern)	N	1	0	1	2 (0) – Low – no Bionet or eBird records in NSW associated with the subject land. *In regions where power lines traverse habitats where this species is confirmed to occur, it is likely to be at a moderate to high risk of power line strike based on the elevations it is known to fly.*	10, 11, 13, 15, 22, 58, 170
Polytelis swainsonii	Superb Parrot	Y	1	2	1	4 – Moderate – Species occurrences across the Hay Plain are associated with the distribution of Weeping Myall (*Acacia pendula*), which does not extend significantly into the subject land, although rare outlying records exist. *This species may be at greater risk of power line strike where it frequents habitats with tall vegetation, but local habitats used by this species are largely below powerline height, particularly in the region of the subject land, and further reduced by familiarity with local features.*	7, 10, 11, 13, 26, 28, 45, 46, 237, 343

Scientific name	Common name	Records within 50 km of proposed alignment	Flight movement type	Population size occurrence average	Typical flight pattern	Likelihood of collision	PCT habitats
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	Y	1	1	0	2 – Low – Due to the species habits being limited to strata below the canopy top in woodlands associated with the indicative disturbance area.	10, 13, 15, 19, 22, 26, 28, 58, 237, 266, 277, 319
Pyrrholaemus brunneus	Redthroat	N	1	0	0	1 (0) – Low – No records in the region of the subject land. The species is confined to shrubby substrates and does not ascend significantly above such habitats. *In regions where power lines traverse habitats where this species is confirmed to occur, it is likely to be at a low risk of power line strike due to its exclusive preference for habitats with low vegetation.*	17, 153, 163
Rostratula australis	Australian Painted Snipe	Y	1 and 3	1	1	3–5 – Moderate – A wetland species that spends almost all of its time foraging in wet substrates. Movements randomly follow the ever-changing distributions of water in the landscape. The species flight patterns and elevations are not documented.	2, 7, 10, 11, 13, 17, 24, 47, 53, 160

Scientific name	Common name	Records within 50 km of proposed alignment	Flight movement type	Population size occurrence average	Typical flight pattern	Likelihood of collision	PCT habitats
Stagonopleura guttata	Diamond Firetail	Y	1	1	0	2 – Low – Due to general scarcity and habits limited to strata below canopy top in woodlands associated with the indicative disturbance area.	2, 7, 10, 11, 13, 19, 22, 26, 28, 44, 45, 46, 58, 237, 266, 277, 319, 343
Stictonetta naevosa	Freckled Duck	Y	1 and occasionally 3	1	0	<4 – Moderate – As with other waterfowl their greatest risk of powerline strike occurs when wetland access involves obstacles that they have to negotiate. Where power lines occur close to wetlands the risk of waterfowl strike increases.	2, 7, 10, 11, 13, 17, 24, 53, 160

Scientific name	Common name	Records within 50 km of proposed alignment	Flight movement type	Population size occurrence average	Typical flight pattern	Likelihood of collision	PCT habitats
Tyto novaehollandiae	Masked Owl	Y	1	0	0	1 (0) – Low – There are no records for this species close to the subject land, but a record occurs to the south of the Dinawan substation at Jerilderie alongside another regional record at Deniliquin. There are no close records for this species in other databases, and Barn Owls are often mistakenly identified as this species. The species is considered unlikely to occur. *In regions where power lines traverse habitats where this species is confirmed to occur, it is likely to be at a low risk of power line strike due to its nocturnal vision and familiarity of home range habitats.*	7, 10, 11, 13, 24, 26, 53, 237

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Appendix K

Habitat connectivity

K1 Impacts to regional habitat connectivity

K1.1 Introduction

The key impacts on terrestrial connectivity from the proposal will be associated with the construction requirements of Disturbance area A, which refers to an area around the transmission line towers, areas for brake and winch sites and for new/upgraded access tracks in which vegetation would be removed during construction.

This disturbance would include vegetation (including tree) removal and potential sub-surface impacts through construction activities such as grading, excavation, and full tree removal. Except in areas where only temporary disturbance is required (i.e. temporary access tracks and brake and winch sites), this area would also be subject to ongoing maintenance during operation (i.e. removal to ground level) for operational and safety requirements (including bushfire).

The remaining disturbance areas within the transmission line corridor (Disturbance area B and Disturbance area HZ) will retain vegetation to a height of 4 metres within an inner zone (Disturbance area B4) and 10 metres height in an outer zone (Disturbance area B10) (Figure K.1).

This gradual reduction in vegetation removal heights within discrete management zone was specifically designed to minimise impacts on biodiversity, including indirect impacts on terrestrial connectivity.

The retention of understorey vegetation, ground timber within these zones is likely to maintain existing shelter and cover requirements for movement across the corridor.

The proposed operational corridor will effectively result in stepping stones of maintained vegetation within the outer areas of the proposed corridor which will specifically facilitate the movement of most terrestrial fauna species minimum gap requirements, including semi-mobile and sedentary species with the exception of canopy dependent arboreal mammals (Squirrel Glider). See Figure K.1 for explanation.

Furthermore the retention of understorey vegetation within these zones is likely to further mitigate the potential for increased predation by opportunistic species along the corridor.

The operational use of the easement post construction is expected to be minimal and not result in associated impacts of vehicle strike, noise and lighting that would permanently deter fauna movement or reduce further the majority of habitat values provided by the retained vegetation for connectivity.

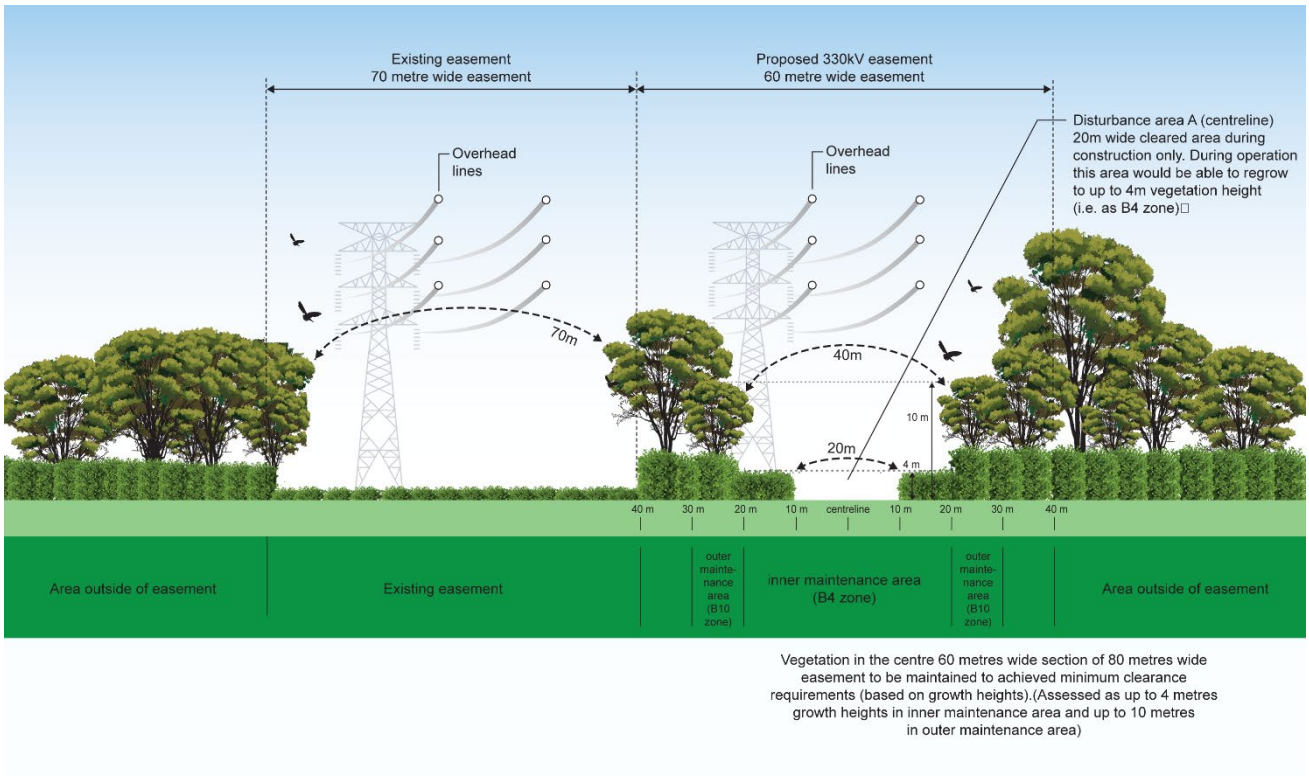


Figure K.1 Steppingstone cross-section of management zones and adjoining easement

K1.2 Target candidate species for mitigation

An effective approach to planning and designing strategies to reduce the negative effects of linear infrastructure on wildlife is to focus on a small number of 'target' species, rather than the hundreds of species that may occur there. This group of target species should reflect the broader assemblage of species in the area that are impacted by the linear infrastructure and represent the needs and requirements of all species. For example, target species should encompass a wide range of groups (e.g. birds, mammals, reptiles etc), include common and endangered species, and cover a range of modes of movement (e.g. flying and walking, terrestrial and arboreal) and gap-crossing abilities.

The threatened species, assessed in this BDAR, encompass all mobility classes and subsequently were considered valuable for determining the ecological characteristics for provision of an equivalent or better ecosystem functionality of any alternative biodiversity corridor. However, whilst threatened species have been used for consideration of wildlife connectivity, it is necessary to emphasize that ecosystem functionality is not restricted to these species. Locally occurring non-threatened fauna, such as kangaroos and possums, would also require consideration for ecosystem functionality and connectivity.

Target species were selected from the threatened species list, which were those species identified as having a moderate or higher likelihood of occurrence in the existing corridor, based on the availability of potential habitat, recent records and professional opinion. Target species were categorised based on their movement capabilities:

- Mobile species are either capable of defending themselves or evading predators in the open, nomadic by nature, or may inhabit open country areas solely or as part of the range of habitats they frequent. Therefore, mobiles species are not considered to be affected by gaps of less than 1,000 m.

- Semi-mobile species are those species with semi-mobile capability, and while large enough to traverse reasonably large gaps in forest vegetation, they are essentially woodland and forest animals that are dependent on cover or woodland trees for their movements. Many small-medium sized birds and small microbats fall into this category, establishing relatively small home ranges in their preferred habitat with a reluctance to move outside those territories, but nevertheless being equipped with the means to cross larger gaps when they are forced to. Semi-mobile species are considered unaffected by gaps less than 100 m. However, gaps less than 100 m that also contain traffic and other disturbances may represent a filter or barrier to their movement.
- Sedentary species (many species of amphibian, reptile, small mammals, some birds) often occur with small territories that they rarely leave, due to the necessity of familiar cover to protect them from predatory animals. Such species are highly dependent upon the integrity of corridor habitats to maintain contact between populations at either end of the corridor. As the key requirements for this group, the least mobile cohort of corridor animals, represent the fundamental components of forest and woodland structure, the same structural components will be utilised by those animals which are more mobile and less dependent upon the linkage function of the corridor. For example, Squirrel Glider, reptiles and some small bird species.

For the purposes of this report, mobile species are not considered further as this group are not likely to be dependent upon specific mitigation measures to overcome the transmission line barrier.

Table K.1 Candidate species impacted by terrestrial connectivity (semi-mobile and sedentary species)

Common name	Barriers	Estimated gap crossing	Use of mitigation structures
Semi-mobile species			
Woodland birds (Brown Treecreeper, Varied Sittella, Black-chinned Honeyeater, Diamond Firetail)	Fragmented landscape with no matrix of paddock trees linking adjacent habitat	Woodland birds considered unlikely to cross unvegetated gaps >100 m.	— Species would typically require habitat stepping-stones to facilitate dispersal — Maintained vegetated understorey within B4 and B10 zones — Maintained vegetated corridors <10 metres in height.
Koala	Barriers to movement include roads and urban development. Although known to cross agricultural land with scattered trees, areas devoid of vegetation restrict dispersal	Species assumed unlikely to cross unvegetated gaps >100 m	— Known to use culvert underpasses, open span bridges and land bridges with appropriate species-specific furniture — Maintained vegetated understorey within B4 and B10 zones — Maintained vegetated corridors <10 metres in height.

Common name	Barriers	Estimated gap crossing	Use of mitigation structures
Amphibians (Sloane's Froglet, Booroolong Frog, Southern Bell Frog, Painted Burrowing Frog)	Fragmentation of areas of riparian, permanent water, depressions within grassy woodlands and Mallee communities where clearing to ground level is required	Species assumed unlikely to cross unvegetated gap >50 m	— Maintained vegetated understorey within B4 and B10 zones — Maintained vegetated corridors <10 m in height.
Plains-wanderer	PCT's 44, 46 Habitat constraint: As per important mapped areas	Plains-wanderer is an open country species Known to occupy existing transition line corridors (David Parker pers com 2021)	— Maintained vegetated understorey within B4 and B10 zones.
Sedentary species			
Squirrel Glider	Squirrel Gliders are reluctant to come to the ground to cross gaps and crossing width depends on tree height on either side of the gap. Glides of 20 m – 30 m are typical	Gaps >40 m likely to be prohibitive	— Known to use glider poles and canopy bridges over dual-carriageway highways, and likely to use Under-transmission glider poles — Maintained vegetated corridors <10 m in height.
Reptiles (Gray Snake, Striped Legless Lizard, Pink-tailed Legless Lizard)	Fragmentation of areas of habitats and grassy woodlands	Species assumed unlikely to cross unvegetated gap >50 m	— Maintained vegetated understorey within B4 and B10 zones — Maintained vegetated corridors <10 m in height.
Species important for ecosystem function			
Arboreal mammals (e.g. Sugar Glider, Common Brushtail Possum)	Barriers to movement include roads and urban development.	Gaps >40 m likely to be prohibitive	— Known to use glider poles and canopy bridges over dual-carriageway highways, and likely to use Under-Transition glider poles — Maintained vegetated understorey within B4 and B10 zones — Maintained vegetated corridors <10 m in height.

Common name	Barriers	Estimated gap crossing	Use of mitigation structures
Terrestrial mammals (Kangaroos and Wallabies)	Eastern Grey Kangaroo is an open country species. Swamp Wallaby generally restricted to vegetated habitats	Swamp Wallaby assumed unlikely to cross gaps >100 m	— Maintained vegetated understorey within B4 and B10 zones — Maintained vegetated corridors <10 m in height.

K1.2.1 Under-transmission line glider poles

A novel approach to mitigate the barrier impacts of the transmission line for gliders is the use of under-transmission glider poles which can include timber poles and/or retained tall tree trunks where possible (refer to Photo K.1). Retained tree trunks are trees that are killed by poisoning or ringbarking and pruned to the maximum height allowed under the conductors.

The following guidance applies to glider crossings, regardless of whether they are comprised of glider poles, retained trunks or a combination of both:

- The poles and trunks will be the maximum height allowed under the transmission line at each location.
- The array of poles and tree trunks will be micro-sited to where the clearance under the transmission line is at its maximum and where optimal habitat for Squirrel Gliders occurs, such as large and hollow-bearing trees.
- The cross-arm on the top of the poles shall be at least 2–3 m on each side of the pole and point towards the next pole or retained trunk.
- The success of glides shall be modelled at each location to ensure the poles and/re retained trunks are tall enough and positioned to ensure glides are feasible in both directions.

It is proposed that under-transmission line glider poles and/or retained tree trunks will be installed in areas of identified Squirrel Glider habitat subject to proposal clearing in key connectivity locations. The intention is to retain a single row or ideally a 10–20 m wide strip of poles and/or tall tree trunks which allows gliders to traverse the gap using multiple small glides, rather than a single long glide or rope ladder. The use of 'natural' glider poles (i.e. retained tall tree trunks) offers a number of likely advantages over timber poles (Photo K.1) and the following points are relevant:

- They are wider than timber poles, providing a large landing surface.
- Retaining tree trunks is cheaper than procuring, transporting and installing glider poles.
- If the trees are resistant to decay and with the root system still intact, they should remain standing for at least 30 years, if not longer. An arborist must inspect each trunk proposed for retention and determine if they are in good enough condition to remain standing for at least 30 years.
- The trunks will maintain bark for a number of years, and eventual decay of the wood will provide food for invertebrates, which in turn are food for Squirrel Gliders.
- Tree trunks will also provide habitat for a wide range of other species, including woodland birds, reptiles and other arboreal mammals.
- Chainsaw hollows can be installed into retained trunks if the stems are sufficiently large.
- Provided the tree has been sufficiently pruned and the weight of the canopy reduced and location identified correctly for retention, the risk of collapse and damage to the proposal structure will be zero.
- Each tree to be retained as a trunk must be inspected and pruned by a qualified arborist with a minimum Level 3 Certificate in Arboriculture or equivalent plus demonstrated experience in inspecting and pruning trees for habitat.

- The glide ratio (glide distance divided by height dropped) of Squirrel Gliders has been calculated at 1.84 (equivalent to a glide angle of 29° (Goldingay & Taylor 2009). With this ratio, the maximum distance between trunks that are 10 m in height is 18.4 m. However, gliders should land at least 2 to 3 m above the ground and shorter glides are typically steeper in descent initially because of the effect of a steep launch and less distance to level off, and therefore, trunks that are 10 m in height should be a maximum of 10–15 m apart.
- The retained trunks should be located away from the proposal structure so that if they collapse, they do not damage the tower. If the trunks, branches or coppice regrowth is within striking distance of the proposal, they should be inspected by a qualified arborist every few years to assess the extent of coppice growth and decay and residual risk. Coppice regrowth is poorly connected to the main stem and poses a higher incidence of failure than normal branches. A qualified arborist should advise on the required inspection frequency.
- The structural root zone of each retained trunk should not be damaged because these are what will support the tree in the long term.
- The retained trunks should be relatively straight and vertical to reduce the risk of collapse and maximise standing longevity. Decay within the trunks is acceptable provided there are multiple stems within gliding range.
- Maintain as much canopy adjacent to the proposal structures where the trunks will be retained to provide connection to the trunks and provide shelter to the trunks from extreme wind to increase their standing lifespan.

Figure K.2 provides a conceptual diagram for under-transmission line glider poles. This is an example of what could be implemented, the heights of poles and distances between poles included in the diagram are examples only. The glider poles and/or rope bridges that would be implemented would be designed considering the project constraints including:

- clear access must be maintained to transmission infrastructure for operation and maintenance
- an exclusion zone of 30 metres applies from any part of a transmission line structure, and 17 metres from the centre of a transmission line
- a height limit of 4.3 metres applies for all structures and development activities
- all metal structures must be earthed
- structures must be designed so they don't encourage climbing (by people).

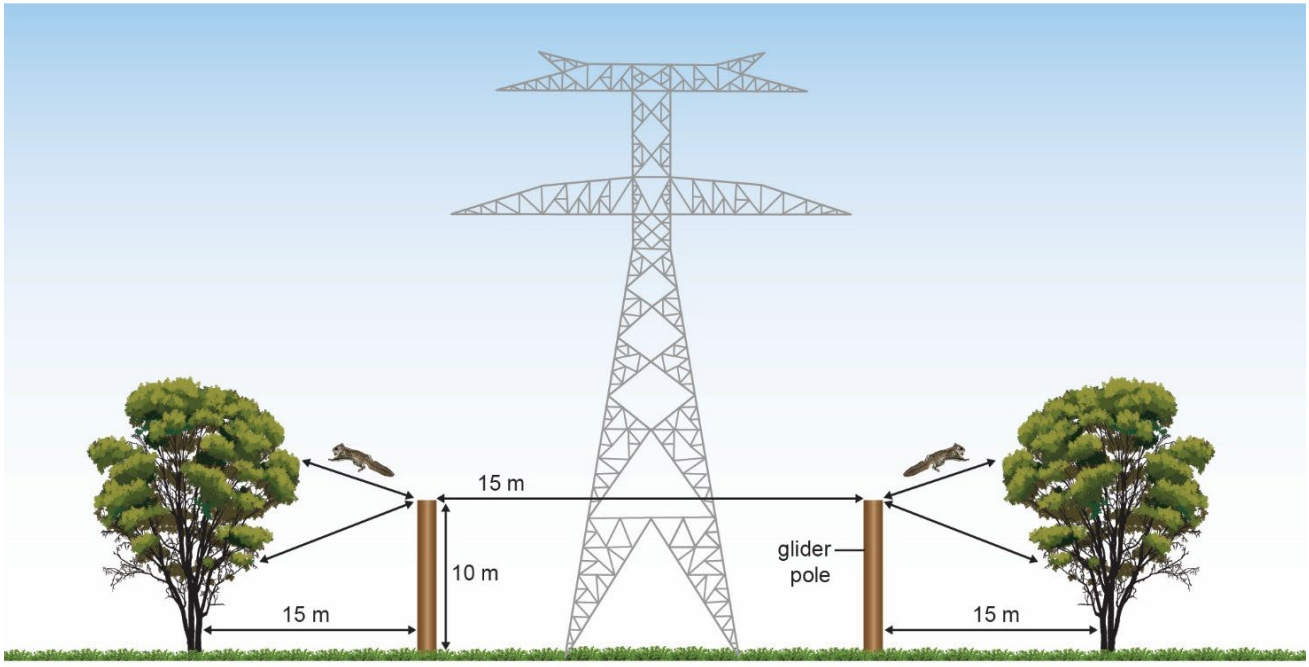


Figure K.2 Conceptual under-transmission glider poles



Photo K.1 Two arrays of artificial glider poles under a road in Ontario, Canada, installed for the Northern Flying Squirrel and (right) retained tree stumps under bridge along Pacific Highway NSW for Squirrel Gliders. Photo at left courtesy of Christine Kelly



Photo K.2 Two arrays of artificial glider poles over a road. The left photo is from Pacific Highway Woolgoolga to Ballina and the right photo is from Hume Highway in southern NSW. Photos by Rodney Van Der Ree

K1.3 Connectivity Strategy

As outlined in the BDAR a Connectivity Strategy would be developed during detailed design. The core objectives of the strategy would be to outline the final location of the proposed mitigation measures identified within the revised BDAR, including a series of 20-metre-wide connectivity corridors would be established near transmission line structure locations that occur in woodland vegetation. These connectivity corridors would involve native vegetation retention up to the 10 metre (330 kV line) or 20 metre (500 kV line). The inclusion of these corridors would also assist in further reducing clearing volumes during design refinement stage. Connectivity corridors would occur as a minimum at:

- key riparian crossings
- areas of the alignment joining proposed state forests or conservation reserve estate
- areas of existing dense woodland.

Exact locations and mapping of connectivity areas would be based on the Connectivity Strategy developed during detailed design. Proposed locations are also shown on the BDAR Figure 15.16 Habitat connectivity and wetland locations. These locations are shown on the figure as “Proposed connectivity corridor”.

Appendix L

Secretary's Environmental Assessment Requirements

Planning Secretary's Environmental Assessment Requirements

Section 5.16 of the *Environmental Planning and Assessment Act 1979*

Part 8 of the Environmental Planning and Assessment Regulation 2021

Application Number	SSI-72887208
Project	Victoria to New South Wales Interconnector West (VNI West), which includes: • approximately 235 km of new 500kV double-circuit overhead transmission line between the NSW and Victoria border near Murrabit and the new Dinawan substation; • expansion of the new Dinawan 330 kV substation; • connection and line diversion works at the existing Wagga Wagga substation, new Dinawan substation; and the new Gugaa substation; and • ancillary works, such as temporary facilities including construction compounds and laydown areas, upgrading or establishing new access tracks, concrete batching plants, stockpiling areas, accommodation facilities, and site offices.
Location	• From the Victorian border at Murrabit to the new Dinawan substation in NSW, traversing the Murray River, Edward River and Murrumbidgee local government areas (LGAs). • From the Wagga Wagga substation and finishing at the new Gugaa substation, within the Wagga Wagga LGA.
Proponent	Transgrid
Date of Issue	4 October 2024
General Requirements	The Environmental Impact Statement (EIS) must meet the minimum form and content requirements as prescribed by Part 8 of the *Environmental Planning and Assessment Regulation 2021* (the Regulation) and must have regard to the *State Significant Infrastructure Guidelines*. In particular, the EIS must include: • a stand-alone executive summary; • a summary of the background to the project, including alternatives that were considered to the project; • a full description of the project, accompanied by suitable maps and plans, including the: - disturbance area; - physical layout of the project over time, including sections of key components; - key uses and activities to be carried out on site; - likely timing of the project including any stages, the key phases within each stage (site preparation, construction, commissioning, operation, decommissioning and rehabilitation) and the sequencing of these stages and phases; - the Project Area (as per Table 1 of the SSI guidelines – preparing an environmental impact statement) and Development Footprint (disturbance area including but not limited to areas for infrastructure, road works, access tracks); - consistency in information presented in the EIS and all technical reports,

	including distances, development footprint, project design and infrastructure proposed, construction timeframes and receiver numbers; • the relevant strategic context for the project, having regard to: - State legislation, policies and guidelines including current initiatives to improve energy security and reliability in the National Electricity Market; - any other existing, approved or proposed projects that could result in cumulative impacts with the project; and - an analysis of the feasible alternatives to carrying out the project, considering its objectives, including the consequences of not carrying out the infrastructure; • the relevant statutory context for the project, including: - the assessment pathway for the project under the *Environmental Planning and Assessment Act 1979*; - the approvals required before the project may be carried out; and - any relevant matters for consideration; • a description of the engagement that was carried out during the preparation of the EIS, the key issues raised during this engagement and the proposed engagement strategy for the project if it is approved; • a risk assessment of the potential environmental impacts of the project, identifying the key issues for further assessment; • an assessment of the likely economic, social and environmental impacts of the project having regard to the requirements in any relevant Government legislation, policies and guidelines (see below), and any other significant issues identified in the risk assessment, focusing on the specific issues identified below, including: - the state of the existing environment; - community views; - the measures that would be implemented to avoid or minimise impacts, including a consolidated summary of the proposed mitigation measures for the project; - the predicted impacts of the project, including any cumulative impacts of the site and existing or proposed developments in the region taking into consideration any relevant legislation, environmental planning instruments, guidelines, policies, plans and industry codes of practice including Cumulative Impact Assessment Guideline (DPIE); and - actions proposed to deal with any uncertainties associated with the assessment; and • a detailed evaluation of the merits of the project as a whole. **Estimated Development Cost and Employment** • Provide the estimated cost (EDC) of the project prepared in accordance with the relevant planning circular using the Standard Form of EDC Report. • Provide an estimate of the retained and new jobs that would be created during the construction and operational phases of the project including details of the methodology to determine the figures provided. In addition the EIS must also be accompanied by a declaration from a Registered Environmental Practitioner that the EIS includes the information specified in the Department's *Registered Environmental Assessment Practitioner Guidelines.*
Key issues	The level of assessment of key matters must be proportionate to the likely significance of the impacts on the matter. In particular, the EIS must address the following specific matters: **Biodiversity:** • an assessment of the biodiversity impacts of the project, in accordance with the *NSW Biodiversity Conservation Act 2016*, the Biodiversity Assessment Method (BAM) and documented in a Biodiversity Development Assessment Report (BDAR). The BDAR must: - be prepared using the approved BDAR template; - document the application of the avoid, minimise and offset framework including assessing all direct, indirect and prescribed impacts in accordance with the

BAM;
  - assess any impacts to nearby conservation areas, including Murray Valley National Park (including the Wetuppa Forest) and South West Woodlands Nature Reserve;
  - assess the impacts associated with all ancillary infrastructure, including the transport route road upgrades;
  - include an assessment for SAII in accordance with Section 9.1 of the BAM; and
  - be finalised by an accredited assessor as BAM-compliant within 14 days of submission;
- an assessment of the likely direct and indirect impacts on listed aquatic threatened species, populations or ecological communities, scheduled under the *Fisheries Management Act 1994*, and a description of the measures to minimise and rehabilitate impacts;
- a cumulative impact assessment of biodiversity values in the region from nearby developments; and
- if an offset is required, details of the measures proposed to address the offset obligations.

Heritage:

- an assessment of the impact to Aboriginal heritage (cultural and archaeological), including test excavations, in accordance with the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH, 2011) and the Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW (DECCW, 2010);
- evidence of adequate consultation with Aboriginal parties in determining and assessing impacts, having regard to the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010);
- if the test excavations do not conform with the Code of Practice, then the excavations may only be carried out with the written endorsement of Heritage NSW following consultation with the Registered Aboriginal Parties; and
- an assessment of the impact to historic heritage having regard to the *Guidelines for Preparing a Statement of Heritage Impact (DPE, 2023).*

Water and Soils:

- an assessment of the impacts of the project on the quantity and quality of the region's surface water resources, including the Murray River, Edward-Wakool system, Billabong-Yanco system, the Murrumbidgee River and other watercourses present within the proposed corridor, having regard to NSW Water Quality Objectives;
- details of water requirements, supply arrangements and wastewater disposal arrangements for construction and operation (including consultation with suppliers);
- an assessment of the impacts of the project on groundwater aquifers and groundwater dependent ecosystems having regard to the *NSW Aquifer Interference Policy* and relevant Water Sharing Plans;
- an assessment of the potential flooding impacts and risks of the project;
- where the project involves works within 40 metres of the high bank of any river, lake or wetlands (collectively waterfront land), identify likely impacts to the waterfront land, and how the activities are to be designed and implemented in accordance with the DPI *Guidelines for Controlled Activities on Waterfront Land* (2018) and (if necessary) *Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings* (DPI 2003); and *Policy & Guidelines for Fish Habitat Conservation & Management* (DPI, 2013); and
- a description of the erosion and sediment control measures that would be implemented to mitigate any impacts in accordance with *Managing Urban Stormwater: Soils & Construction* (Landcom 2004).

Land:

- an assessment of impacts of the project on soils and land capability of the site

and surrounds;
- identify potential biosecurity risks and appropriate strategies to prevent, eliminate or minimise those risks;
- an assessment of the risk of soil contamination and disturbance of land (including associated with naturally occurring asbestos in the vicinity of the site); and
- an assessment of impacts of the project on agricultural land, land reserved under the *National Parks and Wildlife Act 1974*, Crown lands including State Forests, travelling stock reserves, mineral resources and exploration licenses, rail reserves and pipeline corridors.

Transport:

- an assessment of the peak and average traffic generation, including light vehicles, shuttle buses, heavy vehicles and high risk heavy vehicles requiring escort and construction worker transportation;
- an assessment of the likely transport impacts to the site access route(s), including the above listed vehicles, site access point(s), any Crown land, particularly in relation to the capacity and condition of the roads, road safety and intersection performance;
- a cumulative impact assessment of traffic from nearby developments (including mining operations);
- provide details of measures to mitigate and / or manage potential impacts (developed in consultation with the relevant road / rail authorities) including:
  - a schedule of all required road upgrades (including resulting from heavy vehicle and over mass / over dimensional traffic haulage routes);
  - clear figures of proposed road upgrades (including the site access point); and
  - road maintenance contributions, and any other traffic control measures; and
- details of the ongoing maintenance works required to service assets, outlining the measures to maintain the road;

Visual:

- a detailed assessment for the whole project of the likely visual impacts of the project on surrounding residences, scenic or significant vistas, night lighting, air traffic and road corridors in the public domain; and
- provide details of measures to mitigate and / or manage potential impacts.

Noise:

- including an assessment of the construction noise impacts of the project in accordance with the *Interim Construction Noise Guideline* (ICNG), blasting impacts, cumulative noise impacts (considering other developments in the area), and operational noise impacts in accordance with the *NSW Noise Policy for Industry* (2017), including corona noise; and
- provide details of measures to mitigate and / or manage potential impacts.

Air Quality:

- an assessment of the air quality impacts of the project, including from dust.

Hazards:

- identify possible effects on telecommunications systems, assess impacts and mitigation measures to avoid potential disruptions to radio communication services, which may include the installation and maintenance of alternative sites;
- an assessment of potential hazards and risks associated with electric and magnetic fields (EMF) having regard to the latest advice of the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA);
- an assessment of the risks to public safety, paying particular attention to bushfire risks, emergency egress and evacuation, the handling and use of any dangerous goods and potential impacts to high pressure gas pipelines;
- describe the bushfire protection measures for the project, including the proposed approach to vegetation management in the transmission easement, having regard to the requirements in the *Planning for Bushfire Protection Guideline* (RFS 2019); and

	• assess potential impacts on aviation safety, including: - defined air traffic routes, aircraft operating heights, approach / departure procedures, radar interference, communication systems, navigation aids, use of emergency helicopter access, aerial baiting and culling in the National Parks, safe and efficient aerial application of agricultural fertilisers and pesticide, and aerial fire control; - identify certified aerodromes within 30km of the transmission line and uncertified aerodromes and landing areas within 10km of the transmission line, and consider the impact to nearby aerodromes, aircraft landing areas; - address impacts on obstacle limitation surfaces; and - identify aviation marking requirements, if any. **Waste:** • identify, quantify and classify the likely waste streams to be generated throughout all stages of the project, and describe the measures to be implemented to reduce waste generation, manage, reuse, recycle and safely dispose of this waste (in consultation with waste facilities, including Council). **Social Impact:** • an assessment of the social impacts in accordance with *Social Impact Assessment Guideline* (DPIE) and *SIA Guideline - Technical Supplement* (DPE) and consideration of any increase in demand for community infrastructure and services, and details of how the construction workforce will be managed to minimise local impacts, including consideration of construction workforce accommodation. **Economic:** • an assessment of the economic benefits of the project for the region and the State as a whole, including: - an assessment of the impacts to State Forests; and - details of any proposed benefit sharing arrangements.
Plans and Documents	The EIS must include all relevant plans, architectural drawings, diagrams and relevant documentation required under Part 8 of the EP&A Regulation. Provide these as part of the EIS rather than as separate documents. In addition, the EIS must include high quality files of maps and figures of the subject site and proposal.
Legislation, Policies & Guidelines	The assessment of the key issues listed above must take into account relevant guidelines, policies, and plans as identified. A list of some of the legislation, policies and guidelines that may be relevant to the assessment of the project can be found at: • https://www.planning.nsw.gov.au/Policy-and-Legislation/Planning-reforms/Rapid-Assessment-Framework/Improving-assessment-guidance • https://www.planningportal.nsw.gov.au/major-projects/assessment/policies-and-guidelines; and • https://www.dcceew.gov.au/environment/epbc/publications#assessments.
Engagement	During the preparation of the EIS, you must consult with the relevant local, State or Commonwealth Government authorities, infrastructure and service providers, community groups, affected landowners, Native Title holders, exploration licence holders, quarry operators and mineral title holders.
Expiry Date	If you do not lodge an EIS for the infrastructure within 2 years of the issue date of these SEARs, your SEARs will expire. If an extension to these SEARs will be required, please consult with the Planning Secretary 3 months prior to the expiry date.

Attachment A

Guidelines for preparing assessment documentation relevant to the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) for proposals being assessed under the NSW Assessment Bilateral

Victoria NSW Interconnector West Project (EPBC 2024/09871)

Introduction

1. On 4 September 2024, a delegate of the Federal Minister for the Environment and Water determined that the Victoria NSW Interconnector West Project was a controlled action under section 75 of the *Environment Protection* and *Biodiversity Conservation Act 1999* (EPBC Act). The EPBC Act controlling provisions for the proposed actions are:
    i. listed threatened species and communities (sections 18 and 18A).
2. The proposed action will be assessed in accordance with the bilateral assessment agreement Amending Agreement No. 1, and as such, is required to be assessed in the manner specified in Schedule 1 to that Agreement, including, addressing the matters outlined in Schedule 4 of the *Environment Protection and Biodiversity Conservation Regulations 2000* (EPBC Regulations).
3. The proponent must undertake an assessment of all protected matters that may be impacted by the development under the controlling provision identified in paragraph 1. The Federal Minister for the Environment and Water considers that the proposed action is likely to have a significant impact on threatened species and communities listed in **Appendix A**.
4. The proponent must consider each of the protected matters under the triggered controlling provisions that may be impacted by the action. Note that this may not be a complete list and it is the responsibility of the proponent to undertake an analysis of the relevant impacts and ensure all protected matters that are likely to be impacted are assessed for the Commonwealth Minister's consideration.

General Requirements

Relevant Regulations

5. The Environmental Impact Statement (EIS) must address all matters outlined in Schedule 4 of the EPBC Regulations and all matters outlined below in relation to the controlling provisions.

Project Description

6. The title of the action, background to the action and current status.
7. The precise location and description of all works to be undertaken (including associated offsite works and infrastructure), structures to be built or elements of the action that may have impacts on Matters of National Environmental Significance (MNES).
8. How the action relates to any other actions that have been, or are being taken in the region affected by the action.
9. How the works are to be undertaken and design parameters for those aspects of the structures or elements of the action that may have relevant impacts on MNES.

Impacts

10. The EIS must include an assessment of the relevant impacts of the action on the matters protected by the controlling provisions, including:
    i. a description and detailed assessment of the nature and extent of the likely direct, indirect and consequential impacts, including short term and long term relevant impacts;
    ii. a statement whether any relevant impacts are likely to be unknown, unpredictable or irreversible;
    iii. analysis of the significance of the relevant impacts; and
    iv. any technical data and other information used or needed to make a detailed assessment of the relevant impacts.

Avoidance, mitigation and offsetting

11. For each of the relevant matters protected that are likely to be significantly impacted by the action, the EIS must provide information on proposed avoidance and mitigation measures to manage the relevant impacts of the action including:
    i. a description, and an assessment of the expected or predicted effectiveness of the mitigation measures;
    ii. any statutory policy basis for the mitigation measures;
    iii. the cost of the mitigation measures;
    iv. an outline of an environmental management plan that sets out the framework for continuing management, mitigation and monitoring programs for the relevant impacts of the action, including any provisions for independent environmental auditing;
    v. the name of the agency responsible for endorsing or approving each mitigation measure or monitoring program.

12. Where a significant residual adverse impact to a relevant protected matter is considered likely, the EIS must provide information on the proposed offset strategy, including discussion of the conservation benefit associated with the proposed offset strategy.

13. For each of the relevant matters likely to be impacted by the action the EIS must provide reference to, and consideration of, relevant Commonwealth guidelines and policy statements including any:
    i. conservation advice or recovery plan for the species or community;
    ii. relevant threat abatement plan for the species or community;
    iii. wildlife conservation plan for the species; and
    iv. any strategic assessment.

Note: the relevant guidelines and policy statements for each species and community are available from the Department of Climate Change, Energy, the Environment and Water Species Profiles and Threats Database: http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl.

14. In addition to the general requirements described above, specific information is required with respect to each of the determined controlling provisions. These requirements are outlined in paragraphs 15-17.

Key Issues

Biodiversity (threatened species and communities)

Assessment Requirements

15. The EIS must identify each EPBC Act listed threatened species and communities likely to be impacted by the action. For any species and communities that are likely to be impacted, the proponent must provide a description of the nature, quantum and consequences of the impacts. For species and communities potentially located in the project area or in the vicinity that are not likely to be impacted, provide evidence why they are not likely to be impacted.

16. For each of the EPBC Act listed threatened species and communities likely to be impacted by the action the EIS must provide a separate:

    i. description of the habitat (including identification and mapping of suitable breeding habitat, suitable foraging habitat, important populations and habitat critical for survival), with consideration of, and reference to, any relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plans;
    ii. details of the scope, timing and methodology for studies or surveys used and how they are consistent with (or justification for divergence from) published Australian Government guidelines and policy statements;
    iii. description of the relevant impacts of the action having regard to the full national extent of the species or community's range;
    iv. description of the specific proposed avoidance and mitigation measures to deal with relevant impacts of the action;
    v. identification of significant residual adverse impacts likely to occur after the proposed activities to avoid and mitigate all impacts are taken into account;
    vi. a description of any offsets proposed to address residual adverse significant impacts and how these offsets will be established;
    vii. details of how the current published NSW Biodiversity Assessment Method (BAM) has been applied in accordance with the objects of the EPBC Act to offset significant residual adverse impacts; and
    viii. details of the offset package to compensate for significant residual impacts including details of the credit profiles required to offset the action in accordance with the BAM and/or mapping and descriptions of the extent and condition of the relevant habitat and/or threatened communities occurring on proposed offset sites.

Note: For the purposes of approval under the EPBC Act, it is a requirement that offsets directly contribute to the ongoing viability of the specific protected matter impacted by a proposed action and deliver an overall conservation outcome that improves or maintains the viability of the MNES i.e. 'like for like'. Like-for-like includes protection of native vegetation that is the same ecological community or habitat being impacted (preferably in the same region where the impact occurs), or funding to provide a direct benefit to the matter being impacted e.g. threat abatement, breeding and propagation programs or other relevant conservation measures.

17. Any significant residual impacts not addressed by the BAM may need to be addressed in accordance with the EPBC Act 1999 Environmental Offset Policy. www.dcceew.gov.au/environment/epbc/publications/epbc-act-environmental-offsets-policy.

Other approvals and conditions

18. Information in relation to any other approvals or conditions required must include the information prescribed in Schedule 4 Clause 5 (a) (b) (c) and (d) of the EPBC Regulations.

Environmental Record of person proposing to take the action

19. Information in relation to the environmental record of a person proposing to take the action must include details as prescribed in Schedule 4 Clause 6 of the EPBC Regulations.

Information Sources

20. For information given in an EIS, the EIS must state the source of the information, how recent the information is, how the reliability of the information was tested; and what uncertainties (if any) are in the information.

REFERENCES

- *Environment Protection and Biodiversity Conservation Act 1999* - section 51-55, section 96A(3)(a)(b), 101A(3)(a)(b), section 136, section 527E
- *Environment Protection and Biodiversity Conservation Regulations 2000* Schedule 4
- Amending Agreement No. 1 (2020) - Item 18.1, Item 18.5, Schedule 1
- *Matters of National Environmental Significance - Significant impact guidelines 1.1* (2013) EPBC Act
- *Environment Protection and Biodiversity Conservation Act 1999* Environmental Offsets Policy October 2012

The international conventions, management plans and principles that must be considered in relation to this proposal include:

- Australia's obligations under the:
  - Convention on Biological Diversity (Biodiversity Convention);
  - the Convention on Conservation of Nature in the South Pacific (Apia Convention);
  - the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES); and
- Any relevant recovery plans or threat abatement plans.

The policies and plans that must be considered in relation to this proposal include:

- Relevant conservation advice and other relevant policies for each species or ecological community available on the department's SPRAT Database (https://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl)
- Bioregional plans
- Relevant strategic assessment reports.

Commonwealth Listing Advice, Survey Guidelines and Referral Guidelines contain information on threatened species and ecological communities which may provide further support to proponents and NSW DPHI in considering and evaluating the significance of residual impacts on the action's controlling provisions. These documents may be found on the department's SPRAT Database.

Appendix A

Protected matters relevant to the Victoria NSW Interconnector West Project (EPBC 2024/09871)

Specific risks

Key risks associated with the proposed action from the Commonwealth perspective include the potential for:

- Direct impacts to threatened ecological communities:
  - reduce the extent of an ecological community
  - fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines
  - adversely affect habitat critical to the survival of an ecological community
  - interfere with the recovery of an ecological community
- Direct and indirect threats to listed species:
  - habitat clearing
  - displacement from important foraging, nesting and/or breeding habitat
  - reshaping of the topography
  - disturbance and reduced habitat quality due to noise, dust and light spill during construction and operation
  - invasive species or weed dispersal
  - changes to fire regimes.

Listed threatened species and communities and migratory species

Based on the information in the referral documentation, the location of the action, species records and likely habitat present in the area, there are likely to be significant impacts to:

- Natural Grasslands of the Murray Valley Plains – Critically Endangered
- Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains – Critically Endangered
- Weeping Myall Woodlands – Endangered
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland – Critically Endangered.

Additionally, there is some risk that there may be significant impacts on the following matters and further assessment to determine if the communities and species listed below are present in the proposed action area and, if so, the extent to which they may be impacted by the proposed action, is required:

- *Austrostipa metatoris* (a perennial spear grass) – Vulnerable
- Blue-winged Parrot (*Neophema chrysostoma*) – Vulnerable
- Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions – Endangered
- Chariot Wheels (*Maireana cheelii*) – Vulnerable
- Diamond Firetail (*Stagonopleura guttata*) – Vulnerable
- Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia – Endangered
- Grey Snake (*Hemiaspis damelii*) – Endangered

- Grey-headed Flying Fox (*Pteropus poliocephalus*) – Vulnerable
- Major Mitchell's Cockatoo (*Lophochroa leadbeateri leadbeateri*) – Endangered
- Painted Honeyeater (*Stagonopleura guttata*) – Vulnerable
- Pink Tailed Worm Lizard (*Aprasia parapulchella*) – Vulnerable
- Plains mallee box woodlands of the Murray Darling Depression, Riverina and Naracoorte Coastal Plain Bioregions – Critically Endangered
- Plains-wanderer (*Pedionomus torquatus*) – Critically Endangered
- Red Darling-pea (*Swainsona plagiotropis*) – Vulnerable
- Slender Darling-pea (*Swainsona murrayana*) – Vulnerable
- Southern Bell Frog (*Litoria raniformis*) – Vulnerable
- Superb Parrot (*Polytelis swainsonii*) – Vulnerable
- Winged Pepper-cress (*Lepidium monoplocoides*) – Endangered.

Note: uncertainty around the extent and number of protected matters that may be impacted will need to be resolved through the assessment process once final alignment and construction plans have been completed.

Note: this may not be a complete list and it is the responsibility of the proponent to ensure any protected matters under these controlling provisions are assessed for the Commonwealth decision-maker's consideration.

Appendix M

Aquatic biodiversity impact assessment

Transgrid

June 2026

Victoria to New South Wales Interconnector West (VNI West) (NSW)

Aquatic Biodiversity Impact Assessment



Question today
Imagine tomorrow
Create for the future

Victoria to New South Wales Interconnector West (VNI West) (NSW)
Aquatic Biodiversity Impact Assessment

Transgrid

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Rev	Date	Details
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	Name	Date	Signature
Prepared by:	Michelle Patrick; Tia Gabruch	04/06/2026	
Reviewed by:	Jacqui Coughlan	04/06/2026	
Approved by:	Alex Cockerill	04/06/2026	

WSP acknowledges that every project we work on takes place on First Peoples lands.
We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

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Table of contents

Glossary of terms and abbreviations v

1 Introduction 1

1.1 Project context and overview 1

1.1.1 Exhibition of the EIS project 3
1.1.2 VNI West objectives 3

1.2 The amended project 3

1.2.1 Key features 4
1.2.2 Construction 6
1.2.3 Operation 9

1.3 Purpose of this assessment 9

1.3.1 Secretary's Environmental Assessment Requirements 9
1.3.2 Matters of National Environmental Significance 11
1.3.3 Related technical papers 11

1.4 Structure of this report 12

2 Legislation and policy context 13

2.1 Commonwealth legislation 13

2.1.1 Environment Protection and Biodiversity Conservation Act 1999 13

2.2 NSW legislation and policies 13

2.2.1 Fisheries Management Act 1994 13
2.2.2 Water Management Act 2000 14
2.2.3 Policy and guidelines for fish habitat conservation and management (Update 2013) (Department of Primary Industries, 2013) 14
2.2.4 Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (Fairfull and Witheridge 2003) 15
2.2.5 Controlled activities – Guidelines for riparian corridors on waterfront land (NSW Department of Climate Change, Energy, the Environment and Water, 2025a) 15
2.2.6 Controlled activities – Guidelines for watercourse crossings on waterfront land (NSW Department of Climate Change, Energy, the Environment and Water, 2025b)) 16

CONTENTS (Continued)

3 Methodology 17

3.1 Overview 17

3.2 Amended study area 17

3.3 Database and literature review 17

3.4 Likelihood of occurrence assessment 18

3.5 Field surveys and assessment 19

3.5.1 Watercourses surveyed based on EIS project 19
3.5.2 Watercourses assessed based on amended project 19
3.5.3 Habitat assessment 24
3.5.4 Key fish habitat 24
3.5.5 Water quality 25

4 Results 26

4.1 Existing environment 26

4.2 Database search 27

4.2.1 River-based groundwater dependant ecosystems 27
4.2.2 Fish habitat within the amended study area 31
4.2.3 Watercourses crossed by the amended project 31
4.2.4 Threatened aquatic species and communities 45

4.3 Field survey and assessment 48

4.3.1 Watercourse crossing surveys 48
4.3.2 Watercourse crossing desktop assessment 79
4.3.3 Summary of watercourse crossings for field survey and desktop assessment 88

5 Potential impacts 97

5.1 Construction assessment 97

5.1.1 Transmission lines 99
5.1.2 Access tracks 100
5.1.3 Construction compounds and temporary worker accommodation facilities 106

5.2 Operational assessment 107

5.2.1 Access tracks 108

5.3 Threatened species and community assessment 108

5.3.1 Environment Protection and Biodiversity Conservation Act, 1999 108
5.3.2 Fisheries Management Act, 1994 109

CONTENTS (Continued)

6 Management of impacts 112

6.1 Environmental management 112

6.2 Mitigation measures 112

6.3 Offset requirements 117

6.3.1 Impacts to watercourses assessed and offset under the Biodiversity Conservation Act, 2016 117

6.4 Residual aquatic risk assessment 117

7 Conclusion 121

8 References 123

List of tables

Table 1.1 Secretary's environmental assessment requirements – aquatic ecology 10

Table 1.2 Structure, content and notable revisions to the technical paper since exhibition 12

Table 3.1 Likelihood of occurrence criteria for threatened flora and fauna species 18

Table 3.2 Watercourses assessed 21

Table 3.3 Key fish habitat and associated sensitivity classification 25

Table 3.4 Classification of watercourses for fish passage 25

Table 4.1 Ecosystem health rating for Central Murray and Murrumbidgee catchment 26

Table 4.2 Named watercourse crossings within the amended project footprint – NSW/Victorian border to the Dinawan substation 32

Table 4.3 Unnamed watercourse crossings within the amended project footprint – NSW/Victorian border to the Dinawan substation 34

Table 4.4 Watercourses crossings with key fish habitat within the network augmentation works project area 35

Table 4.5 Threatened aquatic species identified within 10 kilometres of the amended project footprint 46

Table 4.6 Description of watercourses surveyed 56

Table 4.7 Description of watercourses surveyed but were outside amended project footprint but data is extrapolated 70

Table 4.8 Desktop assessment of unsurveyed watercourse crossings 80

List of tables (continued)

Table 4.9 Fish habitat assessment outcome overview at survey locations 89
Table 5.1 Potential construction impacts 98
Table 5.2 Named watercourse and access tracks crossings mapped as key fish habitat or having indicative threatened species distribution 102
Table 5.3 Unnamed watercourse and access tracks crossings mapped as key fish habitat or having indicative threatened species distribution 103
Table 5.4 Spawning periods for threatened aquatic species 105
Table 5.5 Waterway crossing type in relation to watercourse class 106
Table 5.6 Assessment of significance for threatened species with moderate to high likelihood of occurrence 109
Table 5.7 Key threatening processes relevant to the amended project (FM Act) 110
Table 6.1 Proposed mitigation measures – Aquatic ecology impact assessment 113
Table 6.2 Risk assessment matrix 117
Table 6.3 Risk ratings (before and after the implementation of mitigation measures) 119

List of figures

Figure 1.1 Location of the project 2
Figure 1.2 Overview of amended VNI West (NSW) 5
Figure 1.3 Proposed construction staging for the amended project 6
Figure 1.4 Indicative duration and sequence of construction activities for transmission line structures 8
Figure 4.1 Aquatic groundwater dependant ecosystems overview 29
Figure 4.2 Mapped threatened species habitat crossed within the VNI Project 36
Figure 4.3 Survey locations overview 50

List of photographs

Photo 4.1 Photographs of Dillions swamp taken September 2025 48

List of appendices

Appendix A Commonwealth EPBC Act assessment of significance

Appendix B Test of significance

Appendix C Habitat assessment results

Glossary of terms and abbreviations

Affected species	A species that is likely to be affected through by direct and/or indirect impacts as a result of the project.
Amended project (the)	The VNI West (NSW) project, as described in the Amendment Report, inclusive of the proposed amendments and refinements to the EIS project.
Amended project footprint (the)	The area that has been assumed for the purpose of the Amendment Report to be directly affected by the construction and operation of the amended project. It includes the indicative location for project infrastructure, the area that would be directly disturbed during construction and easement requirements for operation. The amended project footprint has been developed to achieve a level of flexibility for future design refinement.
Amended study area (the)	Encompasses the amended project footprint and a buffer zone which has been applied to identify the constraints which may or may not be indirectly impacted by the amended project.
Aquatic ecology amended study area (the amended study area)	All the watercourses within the amended project footprint, including a 50-metre buffer, to capture habitat impacts.
Avoid	Measures taken by a proponent such as careful site selection or actions taken through the design, planning, construction and operational phases of the project to completely avoid impacts on biodiversity values, or certain areas of biodiversity.
Biodiversity	The biological diversity of life is commonly regarded as being made up of the following three components: — genetic diversity – the variety of genes (or units of heredity) in any population — species diversity – the variety of species — ecosystem diversity – the variety of communities or ecosystems.
Biodiversity Assessment Method (BAM)	Biodiversity Assessment Method (Department of Planning, Industry and Environment, 2020)
Biodiversity value	Are the following values: — vegetation integrity – being the degree to which the composition, structure and function of vegetation at a particular site and the surrounding landscape has been altered from a near natural state — habitat suitability – being the degree to which the habitat needs of threatened species are present at a particular site — biodiversity values, or biodiversity-related values, prescribed by the regulations under the BC Act.
BioNet Atlas	NSW DCCEEW database of flora and fauna records (formerly known as the NSW Wildlife Atlas). The Atlas contains records of plants, mammals, birds, reptiles, amphibians, some fungi, some invertebrates (such as insects and snails listed under the BC Act) and some fish.

Brake and winch site	A temporarily cleared area where plant and equipment are located to spool and winch conductors into place on transmission line structures. The locations of the brake and winch sites may or may not be within the nominated transmission line easement. These sites are only required for construction of the project and do not need to be maintained during operation.
Class (watercourse)	waterway classification that determines the factors in the functionality of the waterway as fish habitat.
Commonwealth DCCEEW	(Commonwealth) Department of Climate Change, Energy, the Environment and Water
Deleterious substance	Any substance that, if added to any water would degrade or alter the water quality such that it could directly or indirectly harm fish, fish habitat, or the use of fish by humans.
Direct impact	Impacts on biodiversity values and threatened species habitat that relate to clearing native vegetation and impacts on biodiversity values prescribed by the BC Regulation. This includes impacts from activities related to the construction or operational phase of the project.
Early works	Early works includes limited site establishment, fencing and commencing the import of fill material for the Dinawan substation expansion, including heavy vehicle movements to and from local quarries and stockpiling at the Dinawan substation site.
Endangered Ecological Community (EEC)	Endangered ecological communities have a high risk of extinction in the near future as determined by the Fisheries Scientific Committee. An ecological community is eligible for listing as endangered if it has undergone a very large reduction in ecological function, geographic distribution or genetic diversity, and is affected by a threatening process.
EIS project (the)	The project as described in the EIS (publicly exhibited in August 2025)
EIS project footprint (the)	The area that was assumed for the purpose of the EIS project to be directly affected by the construction and operation of the project. It includes the indicative location of project infrastructure, the area that would be directly disturbed during construction and any easement required during operation.
EIS project study area (the)	Encompasses the project footprint and a buffer zone which has been applied to identify the constraints which may or may not be indirectly impacted by the project.
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
Fisheries Spatial Data Portal	NSW DPIRD database of mapped key fish habitat, indicative distribution of threatened aquatic species and other datasets surrounding marine and freshwater environments in NSW
FM Act	*Fisheries Management Act 1994* (NSW)
GDE	Groundwater dependent ecosystems (GDEs) are communities of plants, animals, and other organisms whose extent and life processes are dependent on groundwater.
Groundwater	Water found in the subsurface in the saturated zone below the water table or piezometric surface i.e. the water table marks the upper surface of groundwater systems.
Habitat	An area or areas occupied, or periodically or occasionally occupied, by a species or ecological community, including and biotic or abiotic component.

Indicative disturbance footprint	Refers to the indicative footprint that would be temporarily or permanently cleared during the construction of project comprising the following: — locations of all project infrastructure elements (including the proposed transmission line, transmission line easement, substation works (at the Dinawan, existing Wagga 330 kV and future Gugaa 500 kV substations), telecommunication facilities, and other ancillary works) — locations for construction elements such as construction compounds and temporary worker accommodation facilities, access tracks (excluding public roads proposed to be used for access tracks), site access points, water supply points, laydown and staging areas, concrete batching plants, brake and winch sites and site offices. The area is identified based on realistic project component locations and areas however it is indicative at this stage. The final disturbance area would be confirmed during finalisation of the design and construction methodology and would be developed as part of the consideration of avoidance and impact minimisation. This indicative disturbance footprint includes areas required for operation and maintenance.
Indicative distribution of threatened species	Mapped area that indicates a high probability that the species will occur in a watercourse segment, based on records or environmental conditions.
Indirect impact	An impact on biodiversity values that occurs when project related activities affect threatened species, threatened species habitat, or ecological communities in a manner other than direct impact.
Interconnector	An electricity interconnector is a connection that allows power to flow in both directions between regions in the National Electricity Market (NEM), in this case between NSW and Victoria, providing access to a larger number of electricity generators and greater ability to meet varying demand where and when it is needed most.
Key fish habitat	Vital aquatic environments that support fish populations and are prioritized for conservation under the *Fisheries Management Act 1994*.
Local population	The population that occurs in the indicative disturbance footprint. In cases where multiple populations occur in the indicative disturbance footprint or a population occupies part of the indicative disturbance footprint, impacts on each subpopulation must be assessed separately.
Minimise	A process applied throughout the development planning and design life cycle which seeks to reduce the residual impacts of the project on biodiversity values through effective mitigation.
Mitigation measure	Measures used to reduce, eliminate or compensate for adverse environmental effects.
MNES	Matters of National Environmental Significance
Native vegetation	Means any of the following types of plants native to New South Wales: — trees (including any sapling or shrub or any scrub) — understorey plants — groundcover (being any type of herbaceous vegetation) — plants occurring in a wetland.
NSW DPIRD	NSW Department of Primary Industries and Regional Development
Population	A group of organisms, all of the same species, occupying a particular area.

RC	Riparian corridor
Spawning habitat	specific habitat types or environments where aquatic animals, particularly fish, release their eggs and sperm for fertilization.
Surveyed land	Surveyed land throughout the duration of the project where there was no restricted access.
Threatened species	Critically endangered, endangered or vulnerable threatened species as defined by Schedule 1 of the BC Act, or any additional threatened species listed under Part 13 of the EPBC Act as critically endangered, endangered or vulnerable.
Transgrid (or 'the proponent')	The manager and operator of the high voltage electricity transmission network in New South Wales and the Australian Capital Territory with connections to Victoria and Queensland. Transgrid manages the network that is the backbone of the NEM, which enables energy trading between Australia's three largest states along the east coast.
Transmission line alignment	The location of the transmission line structures along the middle of the transmission line easement.
Transmission line corridor	A generally 200 m wide corridor along the length of the transmission line within which the transmission line, structures and easement would be located (sub set of the project footprint).
Transmission line easement	The area surrounding and including the transmission lines that allows access, construction and maintenance work to take place. The easement grants a right of access and for construction, maintenance and operation of the transmission line and other operational assets. The easements for the new 500 kV transmission line between the NSW/Victorian border and the Dinawan substation would typically be 70 m wide. However, transposition locations would require wider easements up to 110 m wide. The replacement of the 330 kV transmission line generally between Ivy Road (south of the existing Wagga 330 kV substation) and the future Gugaa 500 kV substation would occur within the existing 60 m wide easement.
Transmission line structure	A free standing steel tower structure to support the transmission line cables. Structures can consist of two types of supporting steel lattice structures being: a suspension structure and strain structure (also known as tension structure).
Transposition	Transposition is the periodic swapping of positions of the conductors of a transmission line to improve voltage balance.
Type (watercourse)	fish habitat sensitivity ranking which is used within the policy and guideline statements to differentiate between permissible and prohibited activities or developments related to the importance of key fish habitat.
VNI West	An interconnector of about 480 km between the power grids of NSW and Victoria. Specifically, VNI West would connect the EnergyConnect (NSW – Eastern section) project (at the new Dinawan substation in NSW) with the Western Renewables Link proposal (at Bulgana in Victoria) via a new substation near Kerang (in Victoria).

VNI West NSW (‘the amended project')	The NSW component of VNI West includes: — a new 500 kV transmission line connection between the NSW/Victorian border and Transgrid’s Dinawan substation (currently under construction as part of the EnergyConnect (NSW – Eastern section) project) — replacement of a section of existing single circuit 330 kV transmission line to a double circuit 330 kV line generally between Ivydale Road in Gregadoo and Transgrid’s future Gugaa 500 kV substation (which is subject to a separate planning approval as part of the HumeLink project) — expansion of the Dinawan 330 kV substation to include a new 500 kV switchyard, modifications to the existing 330 kV switchyard, including new 330 kV switch bays to accommodate the South West REZ expansion works — installation of new shunt reactors at the existing Wagga 330 kV substation — connection and transmission line diversion works at both the existing Wagga 330 kV substation and the future Gugaa 500 kV substation to connect the new transmission line infrastructure — ancillary activities to support construction and operation of the project.
VZR	vegetated riparian zone
Watercourse	A natural (i.e. brook, river, creek, stream) or artificially constructed water channel.
Watercourse crossing	A specific location for a proposed structure that allows vehicles, pedestrians, or utilities to cross a natural watercourse. These crossings can include bridges, culverts, and fords, and to facilitate safe passage across the watercourse.
WM Act	*Water Management Act 2000* (NSW)

1 Introduction

This chapter provides the background to VNI West (NSW), a description of the key features of the project as amended since the public exhibition of the EIS and outlines the purpose and structure of this revised technical paper.

1.1 Project context and overview

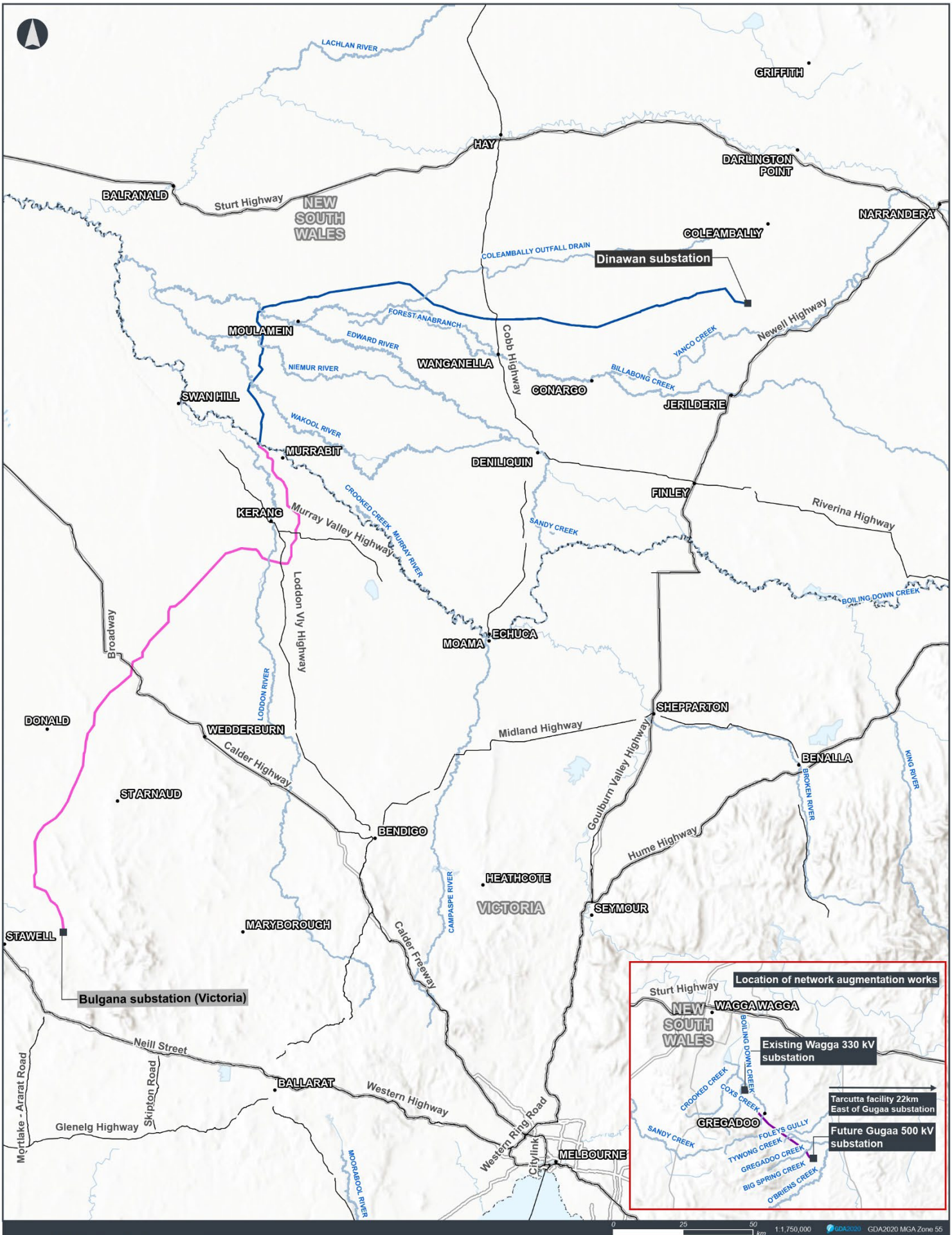
Transgrid and VicGrid 'VNI West' (formerly Transmission Company Victoria) are jointly developing a new electrical connection between NSW and Victoria called the Victoria to NSW Interconnector West project (VNI West). VNI West would form a second transmission link between NSW and Victoria to harness clean, low-cost electricity from Renewable Energy Zones (REZs) in both states and improve the reliability and security of electricity supply. VNI West is a priority project for the Australian Energy Market Operator (AEMO) and the Commonwealth and NSW and Victorian governments.

VNI West proposes the construction, operation and ongoing maintenance of a high voltage, 500 kV double circuit overhead transmission line that would connect the high voltage electricity grids in NSW and Victoria. Specifically, VNI West would connect the Western Renewables Link proposal at Bulgana in Victoria with the EnergyConnect (NSW – Eastern section) project (SSI-9172452) at the Dinawan substation in NSW. The connection would be made via a new substation near Kerang in Victoria.

Transgrid is responsible for seeking the required planning approval and delivering the NSW component of VNI West (referred to as 'VNI West (NSW)') in the Riverina Region of NSW and would provide the 500 kV transmission line component of the connection for the VNI West project. The amended project would be located between the NSW/Victorian border near Murrabit in Victoria and Dinawan substation (the 330 kV component of which is has been constructed as part of the EnergyConnect (NSW – Eastern section) project). The amended project would also include replacement of around nine kilometres of an existing single circuit 330 kV transmission line (Line 51) with a double circuit 330 kV transmission line generally between Ivydale Road (south of the existing Wagga 330 kV substation) and the future Gugaa 500 kV substation, Livingstone Gully Road (the substation component of which is subject to separate planning approval as part of the HumeLink project (SSI-36656827)). The amended project would also include an expansion of the Dinawan substation, installation of new shunt reactors and connections works at the existing Wagga 330 kV substation and connection works at the future Gugaa 500 kV substation, Livingstone Gully Road.

VicGrid VNI West, in association with the AEMO Victoria, is responsible for seeking the required planning approval and the delivery of the Victorian component of the VNI West project (VNI West (Victoria)), from the crossing point on the NSW/Victorian border to a connection with the Western Renewables Link near Bulgana, via a new proposed substation near Kerang. The Victorian component is subject to a separate planning and environmental approvals under the applicable Victorian State and Commonwealth jurisdictional requirements.

VNI West (NSW) would be located across four local government area (LGAs) which consist of Edward River, Murray River, Murrumbidgee, and Wagga Wagga LGAs. Figure 1.1 shows the location of the amended project.



WSP

VNI West (NSW)

Figure 1.1
Location of the project

Legend

- Amended project transmission line corridor (NSW/Victorian border to Dinawan substation)
- Victorian project transmission line corridor (subject to separate assessment)
- Watercourse
- Roads
- Network augmentation between the existing Wagga 330 kV substation and future Gugaa 500 kV substation
- NSW/Victorian border
- Substation



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Data sources: NSW EPI, DELWP, WSP, EnergyConnect

1.1.1 Exhibition of the EIS project

An EIS was prepared to support Transgrid's application for approval of VNI West (NSW) in accordance with the requirements of Part 5, Division 5.2 of the *NSW Environmental Planning and Assessment Act 1979* (EP&A Act). The EIS was placed on public exhibition by the NSW Department of Planning, Housing and Infrastructure (NSW DPHI) for a period of 28 days between 1 August 2025 and 29 August 2025.

Transgrid has identified several proposed amendments and refinements to the EIS project that reflect functional improvements to the design and construction methodology. The amendments and refinements have been made in response to feedback received from landholders and other key stakeholders; ongoing discussion with EnergyCo regarding infrastructure requirements to support the South West REZ and greater clarity regarding the announced delay to the VNI West (Victoria) project in July 2025 (refer to section 1.2.2.1).

The project, inclusive of the proposed amendments and refinements, is referred to as the 'amended project' and is the subject of this revised technical paper.

1.1.2 VNI West objectives

The primary objective of VNI West is to reduce the cost of providing secure electricity transmission between NSW and Victoria in the near term and facilitate the longer-term transition of the energy sector across the National Electricity Market (NEM) to low emission energy generation sources. More specifically, the amended project aims to:

- provide reliable and affordable electricity to customers
- improve energy security of the south western transmission network, enable greater sharing of energy between NSW and Victoria and help to unlock the potential capacity of proposed REZs in the region
- support the national transition to a lower carbon emission energy system by enabling more renewable energy generation to enter the market, supporting Australia's emissions reduction targets
- support the development of a greater mix of renewable energy in the NEM.

1.2 The amended project

Transgrid is seeking approval under Division 5.2, Part 5 of the *Environmental Planning and Assessment Act 1979* (NSW) (the EP&A Act) to construct and operate the project. The project was declared as Critical State Significant Infrastructure (Critical SSI) under Section 5.13 of the EP&A Act on 19 June 2024.

The project was also declared a 'controlled action' on 4 September 2024 (EPBC Act 2024/09871) by the (Commonwealth) Department of Climate Change, Energy, the Environment and Water ((Commonwealth DCCEEW) and as such also requires a separate approval under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act). As a result of the need for Commonwealth approval, the project (as amended) would be subject to the bilateral assessment process that has been established between the Australian and NSW governments. In order to capture the potential additional impacts associated with the amended project, an application under section 156A of the EPBC Act has also been submitted to the Commonwealth DCCEEW to request a variation to the proposed action contained in the original EPBC referral.

1.2.1 Key features

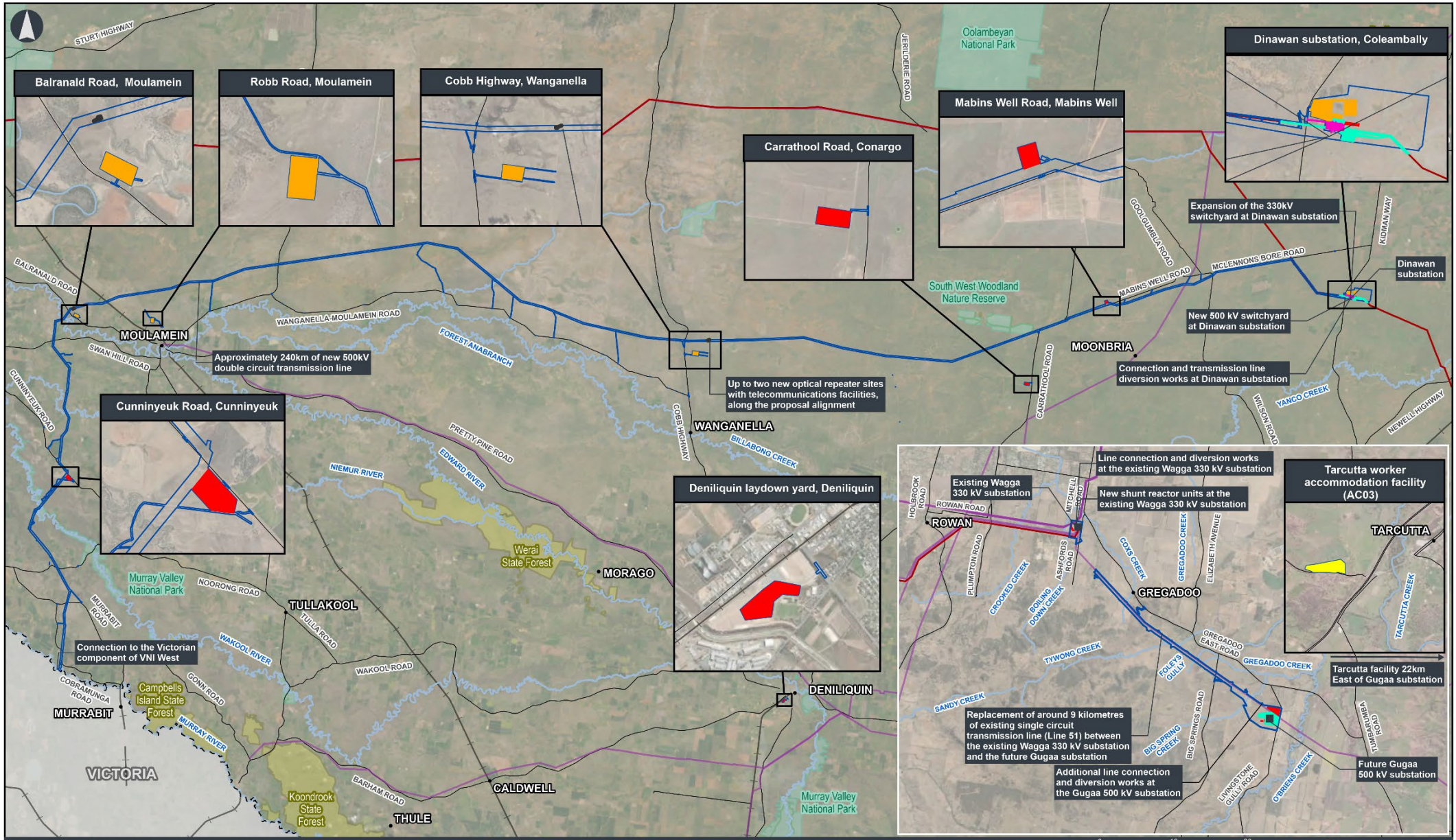
The key components of the amended project include:

- transmission line works comprising:
  - a new 500 kV double circuit overhead transmission line, around 240 kilometres in length between the NSW/Victorian border near Murrabit, and Dinawan substation
  - replacement of around nine kilometres of an existing 330 kV single circuit overhead transmission line (Line 51) generally between Ivydale Road (south of the existing Wagga 330 kV substation) and the future Gugaa 500 kV substation, Livingstone Gully Road with a new 330 kV double circuit overhead transmission line
- substation works comprising:
  - connection and line diversion works at the Dinawan substation to allow for connection of the proposed 500 kV switchyard
  - expansion of the Dinawan substation to include a new 500 kV switchyard and modifications to the existing 330 kV switchyard including works to accommodate the South West REZ expansion
  - installation of new shunt reactors at the existing Wagga 330 kV substation
  - connection and line diversion work at the existing Wagga 330 kV substation and at the future Gugaa 500 kV substation to allow for connection to the newly replaced Line 51
- ancillary activities comprising:
  - new and upgraded temporary and permanent access tracks
  - improvements and upgrades to roads and intersections along construction access routes
  - construction of utilities infrastructure and power supply
  - installation and operation of two telecommunication facilities (optical repeater sites) along the transmission line between the NSW/Victorian border and Dinawan substation including connections to the local power supply
  - temporary facilities required for construction of the project including construction compounds, combined temporary worker accommodation facilities and construction compounds, laydown and staging areas, stockpiling areas, concrete batching plants, brake and winch sites, site offices, parking areas, and utilities supplies.

All components of the amended project would be located within the amended project footprint shown in Figure 1.2. The amended project footprint is the area that has been assessed as being directly affected by the construction, operation and maintenance of the amended project.

The 500 kV transmission line between the NSW/Victorian border and the Dinawan substation would be located within an easement approximately 70 metres wide except at two transposition locations (where the conductors of a transmission line swap positions to improve transmission voltage balance) requiring a wider 110 metre easement for around one kilometre in length. The section of the transmission line to be replaced generally between Ivydale Road (south of the existing Wagga 330 kV substation) and the future Gugaa 500 kV substation, Livingstone Gully Road would be contained within the existing 60 metre easement. These easements would provide a legal right of access to construct, operate and maintain the transmission lines and other operational assets associated with these lines.

The amended project is described in greater detail in Chapter 3 (Description of the amended project) and Appendix A (Updated project description) of the Amendment Report.



wsp

VNI West - Revised Aquatic Assessment

Figure 1.2
Overview of amended VNI West (NSW)

Legend

- Rail line
- Main road
- Named waterway
- National park
- State forest
- NSW/Victorian border
- Existing transmission line
- EnergyConnect (NSW - Eastern section) project
- Dinawan substation works - existing 330 kV
- Amended project footprint
- Dinawan substation works - proposed 500 kV
- Substation
- Telecommunication facility
- Temporary worker accommodation facility
- Combined temporary worker accommodation facility and construction compound
- Construction compound

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Data sources: NSW EPI, DELWP, WSP, EnergyConnect

1.2.2 *Construction*

1.2.2.1 Key construction stages

The amended project is proposed to be delivered in two main stages to both better support the ongoing delivery of renewable energy projects associated with the South West REZ as well as reflect the timing of, and connection to, the VNI West (Victoria) project (refer to Figure 1.3).

Stage 1 of the amended project would include early works (Stage 1a) and the proposed Dinawan substation expansion and network augmentation works (Stage 1b). Stage 1 is expected to commence in mid-2027 and aim to be completed by mid-2029.

Stage 2 includes the construction of the new 500 kV transmission line between the NSW/Victorian border and the Dinawan substation as well as the proposed new shunt reactors at the existing Wagga 330 kV substation. Stage 2 is proposed to commence in mid-2028 with completion targeted in late 2030 to align with the forecast timeframe for delivery of VNI West (Victoria).

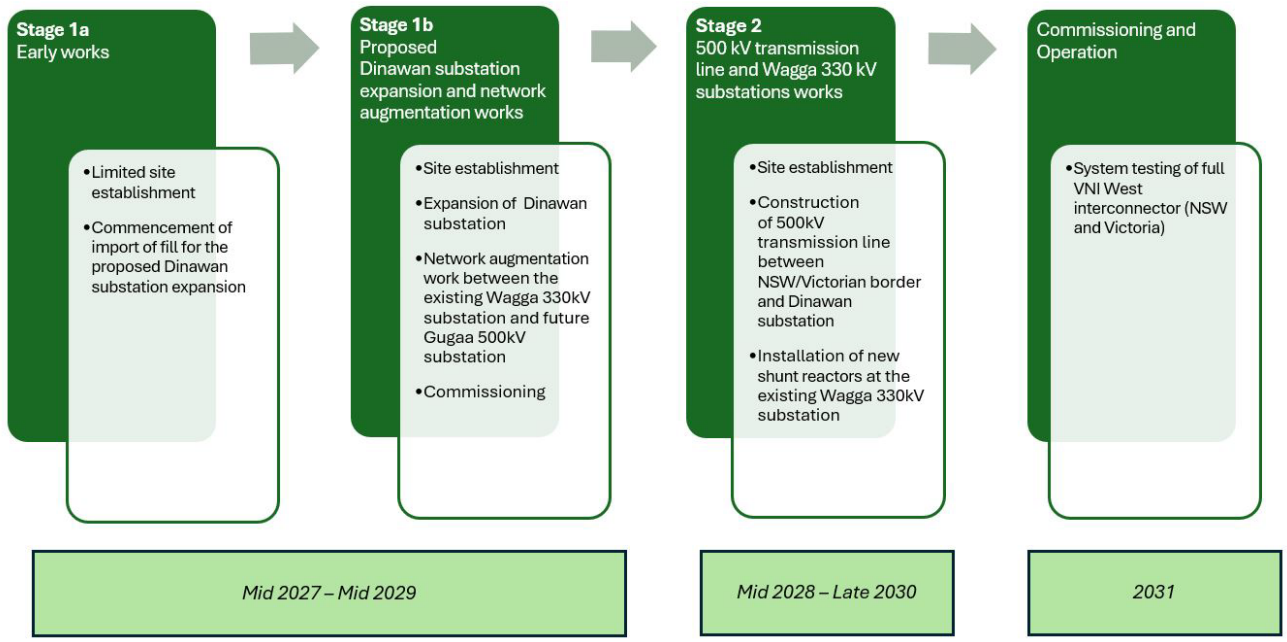


Figure 1.3 Proposed construction staging for the amended project

The final construction program would be confirmed as part of the finalisation of the project development following approval of the project.

1.2.2.2 Key construction work

Key construction work for the amended project would occur across both Stage 1 and Stage 2 of the amended project and would typically include (but not be limited to):

- pre-construction minor work which would include:
  - installation of mitigation measures, including but not limited to erosion and sediment controls, temporary exclusion fencing and monitoring equipment
  - property acquisition adjustment work including installation of property fencing, barricades and gates

- site establishment works, which may include (but not be limited to):
  - establishment of combined temporary worker accommodation facilities and construction compounds, including excavations, surface preparation, access roads and utility connections
  - vegetation clearing
  - road and intersection improvement works (where required)
  - establishment of access tracks and watercourse crossings
  - relocating, adjusting or protecting utilities
- construction of the proposed transmission lines, which would include (but not be limited to):
  - earthwork (including establishment of construction pads) and the construction of footings and foundations for each transmission line structure
  - erection of the new transmission line structures using crane(s) and/or helicopter(s), noting that where cranes are proposed, it is assumed that the final heights of the cranes would extend around 20 metres above the respective transmission line structure heights
  - stringing of the conductors and overhead earth wires and optical ground wire (utilising either ground-based and/or helicopter/drone stringing construction methods)
  - installation of earthing conductors
  - testing and commissioning of the transmission lines
- works to replace around nine kilometres of Line 51 generally between Ivydale Road (south of the existing Wagga 330 kV substation) and the future Gugaa 500 kV substation, Livingstone Gully Road, which would include (but not be limited to):
  - demolition of existing transmission line structures and footings and removal of waste materials
  - erection of the new transmission line structures
  - stringing of the conductors and overhead earth wires and optical ground wire
  - testing and commissioning of the new transmission lines
- expansion of Dinawan substation, which would include (but not be limited to):
  - civil construction works including earthworks
  - slab construction for the new 500 kV switchyard, modifications to the existing 330 kV switchyard including new switch bays
  - electrical fit out with new substation equipment
  - testing and commissioning of the new substation equipment
- works to install new shunt reactors at the existing Wagga 330 kV substation, which would include (but not be limited to):
  - civil construction works including earthworks, drainage works and internal access road construction
  - slab construction for the new shunt reactors
  - electrical fit out with new shunt reactor equipment
  - testing and commissioning
  - reconfiguration of existing security fencing

- utility service connections to telecommunication facilities (optical repeater sites) and construction compounds/temporary worker accommodation facilities, and adjustments of existing utilities that intersect the transmission line corridor (as required)
- connection and transmission line diversion works at the existing Wagga 330 kV substation and future Gugaa 500 kV substation, Livingstone Gully Road.

Prior to energisation of the infrastructure, a series of pre-commissioning activities would be conducted. This would include testing the new transmission lines and additional substation infrastructure.

A detailed description of construction work for the project is described in greater detail in Appendix A (Updated project description) of the Amendment Report.

1.2.2.3 Construction program

Subject to NSW and Commonwealth planning approvals and final construction staging, the proposed Dinawan substation expansion and network augmentation works (Stage 1) are expected to be commissioned/energised in 2029, with initial operation commencing immediately thereafter, to support the South West REZ output.

The proposed 500 kV interconnector between the NSW/Victorian border and the Dinawan substation (Stage 2) is expected to be commissioned/energised in late 2030, with the system at full capacity by around the end of 2031.

The final construction program would be confirmed as part of the finalisation of the project development following approval of the project.

1.2.2.4 Indicative duration of transmission line structure construction

Construction at each transmission line structure would be intermittent and construction activities would not occur for the full duration at any one location. Figure 1.4 presents an indicative duration of construction activities associated with the transmission line structures. These durations could vary and breaks between activities may be shorter, which may lead to longer inactive periods in subsequent stages of construction at an individual transmission line structure. The duration of any particular construction activity, and respite periods, may vary for a number of reasons including (but not be limited to), multiple work fronts, resource and engineering constraints, works sequencing and location.

These activities would also have multiple work fronts. For example, foundation works or structure erection would occur in several locations, along the transmission line easement, at the same time.

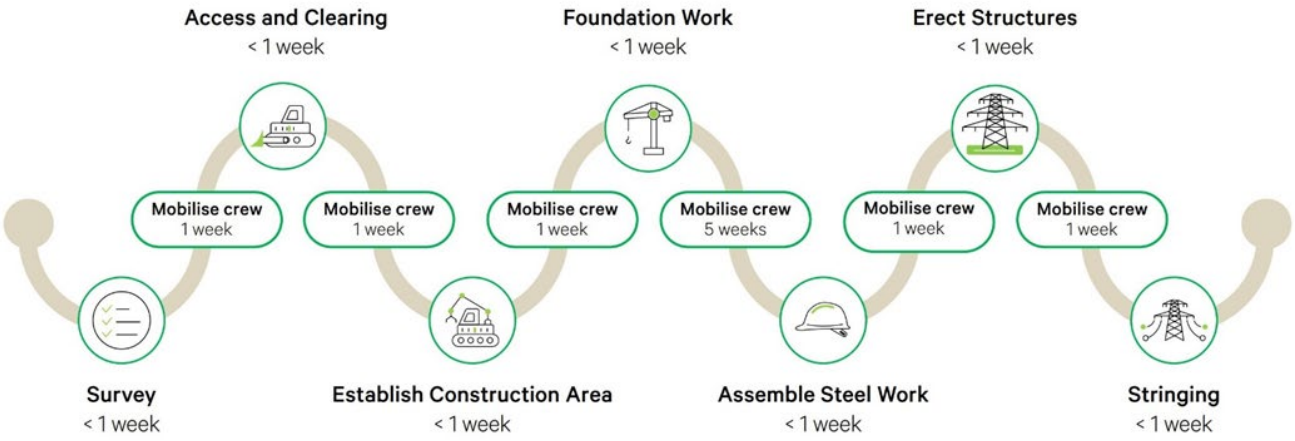


Figure 1.4 Indicative duration and sequence of construction activities for transmission line structures

1.2.3 Operation

Once operational, the new infrastructure would be inspected by field staff and contractors on a regular basis, with other operational activities occurring in the event of an emergency (as required). Key maintenance activities would include:

- regular inspection (ground and aerial) and maintenance of transmission lines and structures, including annual fly overs and routine ground inspections on an approximate six-yearly cycle
- vegetation clearing/trimming within the transmission line easement and along access road/tracks
- inspection and maintenance of the substation facilities including:
  - routine substation infrastructure inspection (such as transformers, electrical plant and equipment and fire detection systems) throughout the year
  - routine/planned substation maintenance of equipment, property and switchyard areas on a scheduled basis
  - ad hoc fault and emergency works for repair of any damaged infrastructure (for example through a weather event or other failure of infrastructure)
  - maintenance of asset protection zones (as required)
- inspection and maintenance of other ancillary infrastructure including the telecommunication facilities and associated asset protection zones
- stormwater drainage maintenance.

It is expected that these activities would only require light vehicles and/or small to medium plant (depending on the work required).

1.3 Purpose of this assessment

The purpose of this assessment is to identify and assess the potential aquatic ecology impacts in relation to the construction and operation of the amended project and has been prepared to support and inform the EIS. It responds directly to the project's Secretary's Environmental Assessment Requirements (SEARs) issued by the NSW Department of Planning, Housing and Infrastructure (DPHI) on 22 May 2025 (refer to section 1.3.1).

The report has the following objectives:

- identify watercourses that contain key fish habitat and potential habitat for threatened aquatic species within the amended project footprint
- identify potential impacts the amended project may have on aquatic ecosystems
- identify mitigation and management measures to minimise identified impacts.

1.3.1 Secretary's Environmental Assessment Requirements

The purpose of this report is to support the VNI West (NSW) Amendment Report through an assessment of the potential aquatic ecology impacts of the amended project. It replaces *Appendix M: Aquatic Biodiversity Impact Assessment* of appended to *Technical paper 1 – Biodiversity Development Assessment Report* (WSP, 2025) as exhibited as part of the EIS.

This revised technical paper addresses the Secretary's Environmental Assessment Requirements (SEARs) issued on 22 May 2025 . The requirements specific to this assessment and where these aspects are addressed in this revised technical paper are outlined in Table 1.1.

Table 1.1 Secretary's environmental assessment requirements – aquatic ecology

Reference	SEAR	Where principally addressed in this report
Biodiversity		
Key issues	an assessment of the biodiversity impacts of the amended project, including impacts associated with transport route road upgrades, in accordance with the *NSW Biodiversity Conservation Act 2016*, the Biodiversity Assessment Method (BAM) and documented in a Biodiversity Development Assessment Report (BDAR). The BDAR must: — be prepared using the approved BDAR template	*Technical paper 1 – Revised Biodiversity Development Assessment Report* (WSP, 2026a), which has been prepared in accordance with the BC Act and the BAM.
	— document the application of the avoid, minimise and offset framework including assessing all direct, indirect and prescribed impacts in accordance with the BAM	*Technical paper 1 – Revised Biodiversity Development Assessment Report* (WSP, 2026a.)
	— assess any impacts to nearby conservation areas, including Murray Valley National Park (including the Wetuppa Forest) and South West Woodlands Nature Reserve;	*Technical paper 1 – Revised Biodiversity Development Assessment Report* (WSP, 2026a).
	— assess the impacts associated with all ancillary infrastructure, including the transport route road upgrades;	This assessment considers the aquatic ecology impacts of ancillary infrastructure, including the transport route road upgrades, as described in Appendix A (Updated project description) of the Amendment Report.
	— include an assessment for SAII in accordance with Section 9.1 of the BAM; and	*Technical paper 1 – Revised Biodiversity Development Assessment Report* (WSP, 2026a).
	— be finalised by an accredited assessor as BAM-compliant within 14 days of submission;	*Technical paper 1 – Revised Biodiversity Development Assessment Report* (WSP, 2026a).
	— an assessment of the likely direct and indirect impacts on listed aquatic threatened species, populations or ecological communities, scheduled under the *Fisheries Management Act 1994*, and a description of the measures to minimise and rehabilitate impacts;	Chapter 5 and 6 of this report.
	— a cumulative impact assessment of biodiversity values in the region from nearby developments; and	Appendix O of *Technical paper 1 – Revised Biodiversity Development Assessment Report* (WSP, 2026a)
	— if an offset is required, details of the measures proposed to address the offset obligations.	Section 6.3 of this report, and in *Technical paper 1 – Revised Biodiversity Development Assessment Report* (WSP, 2026a)

Reference	SEAR	Where principally addressed in this report
Water and soils (extract)		
	— an assessment of the impacts of the amended project on groundwater aquifers and groundwater dependent ecosystems having regard to the *NSW Aquifer Interference Policy* and relevant Water Sharing Plans;	Section 4.2 of this report. The assessment of impacts to groundwater dependent ecosystems (GDEs) in *Technical paper 1 – Revised Biodiversity Development Assessment Report* (WSP, 2026a). Impacts to groundwater aquifers and GDEs is discussed in *Technical paper 10 – Groundwater impact assessment* (WSP, 2025).
	— where the amended project involves works within 40 metres of the high bank of any river, lake or wetlands (collectively waterfront land), identify likely impacts to the waterfront land, and how the activities are to be designed and implemented in accordance with the Department of Primary Industries *Guidelines for Controlled Activities on Waterfront Land* (2018) and (if necessary) *Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings* (Department of Primary Industries, 2003); and *Policy and guidelines for fish habitat conservation and management* (Department of Primary Industries, 2013); and	Section 5.1 and section 5.2 of this report. This is further considered in *Technical paper 9 – Revised hydrology, flooding and water quality* (WSP, 2026c).

1.3.2 Matters of National Environmental Significance

As identified in section 1.2, the amended project is a controlled action and requires an additional approval under the EPBC Act. The amended project is a controlled action due to impacts on listed threatened species and ecological communities (EPBC section 18 and 18A) and would be assessed under the NSW Assessment Bilateral Agreement. The listed threatened species and ecological communities identified by Commonwealth DCCEEW when making this decision did not include any aquatic species.

The NSW Assessment Bilateral Agreement supports certain actions that are considered SSI to be assessed and public exhibited by the NSW Government on behalf of the Commonwealth DCCEEW. As a requirement of the NSW Assessment Bilateral Agreement, the SEARs issued for the amended project set out the relevant Commonwealth requirements. These requirements are addressed in *Technical paper 1 – Revised Biodiversity Development Assessment Report* (WSP, 2026a), which this report is appended (refer to Appendix L of that technical paper for further detail).

This report assesses impacts to EPBC listed aquatic threatened species and communities in section 4.2.4 and Appendix A.

1.3.3 Related technical papers

This report is appended to *Technical paper 1 – Revised Biodiversity Development Assessment Report* (WSP, 2026a) and is linked to the assessments completed in the following technical papers:

- *Technical paper 9 – Revised hydrology, flooding and water quality impact assessment* (WSP, 2026b)
- *Technical paper 10 – Groundwater impact assessment* (WSP, 2025).

1.4 Structure of this report

The structure and content of this revised technical paper, and where chapters have undergone notable change as a result of this revised assessment, is provided in Table 1.2.

Table 1.2 Structure, content and notable revisions to the technical paper since exhibition

Chapter	Content	Summary of notable revisions
1	Introduction	Revised to reflect the amended project and purpose of this technical paper.
2	Legislation and policy context. This chapter outlines the key legislation and policies that are relevant to this assessment	Reference updated to reflect updates to policies and legislation.
3	Methodology. This chapter describes the assessment methodology for the assessment and defines the amended study area	Changes to the methodology have been made to detail the updated watercourse assessment, including surveyed locations, extrapolated surveys and desktop assessments.
4	Results. This chapter discusses the existing environment within the amended study area	Revised to consider the amended project and results from the updated watercourse assessment.
5	Potential impacts. This chapter discusses the potential impacts during construction and operation of the amended project	Revised to consider the amended project, results from the updated watercourse assessment, and feedback provided by NSW DPIRD Fisheries in their submission on the EIS.
6	Management of impacts. This chapter identifies mitigation measures, and presents the risk to aquatic ecology following the implementation of the mitigation measures	Management and mitigation measures were updated to consider the results from the updated watercourse assessment and feedback provided by NSW DPIRD Fisheries in their submission on the EIS.
7	Conclusion	Revised to consider the amended project, results from the updated watercourse assessment, and feedback provided by NSW DPIRD Fisheries in their submission on the EIS.
8	References	Revised to consider reference updates
Appendix A	Commonwealth EPBC Act assessment of significance	Revised to consider the amended project, results from the updated watercourse assessment, and feedback provided by NSW DPIRD Fisheries in their submission on the EIS.
Appendix B	Test of significance	Revised to consider the amended project, results from the updated watercourse assessment, and feedback provided by NSW DPIRD Fisheries in their submission on the EIS.
Appendix C	Habitat assessment results.	New appendix to document the results from field surveys.

2 Legislation and policy context

2.1 Commonwealth legislation

2.1.1 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act (Cth) is the Commonwealth Government's key piece of environmental legislation. It enables the Commonwealth Government to join with the states and territories in providing a national scheme of environment and heritage protection and biodiversity conservation. The EPBC Act (Cth) focuses Commonwealth Government interests on the protection of Matters of National Environmental Significance (MNES), with the states and territories having responsibility for matters of state and local significance.

As identified in section 1.2, the amended project was determined a controlled action under the EPBC Act due to likely impacts on listed threatened species and ecological communities (sections 18 and 18A) and therefore requires assessment and approval under the EPBC Act. This report assesses the potential impacts on EPBC Act listed threatened aquatic species that have the potential to occur within the amended project footprint, specifically:

- Silver Perch (*Bidyanus bidyanus*)
- Murray Hardyhead (*Craterocephalus fluviatilis*)
- Flathead Galaxias (*Galaxias rostratus*)
- Trout Cod (*Maccullochella macquariensis*)
- Murray Cod (*Maccullochella peelii*)
- Murray Spiny Crayfish (*Euastacus armatus*)

2.2 NSW legislation and policies

2.2.1 Fisheries Management Act 1994

The *Fisheries Management Act 1994* (NSW) (FM Act) is the primary piece of legislation to conserve important aquatic values and develop NSW fishery resources. This act has eight main objectives, however, the following three are the most pertinent to this amended project and assessment:

- conserve fish stocks and key fish habitats
- to conserve threatened species, populations and ecological communities of fish and marine vegetation
- to promote ecologically sustainable development, including the conservation of biological diversity.

Part 7 of the FM Act (NSW) relates to the protection of fish and aquatic habitats with the objective of conserving the biodiversity of fish and aquatic vegetation. In accordance with section 5.23 of the EP&A Act (NSW), permits under sections 201 (dredging and reclamation), 205 (permit to harm to marine vegetation) and 219 (permit to obstruct fish passage) of the FM Act (NSW) are not required for Critical SSI or SSI projects.

Part 7A of the FM Act (NSW) lists threatened species, populations and ecological communities and key threatening processes (KTPs) for species, populations and ecological communities in NSW waters. Schedule 4, 4A and 5 of the FM Act (NSW) list the threatened aquatic species, communities and populations.

Under section 220ZW, a licence is required for actions that would likely result in harm to threatened species, populations or ecological communities listed under the FM Act (NSW), or damage to critical habitat or habitat of a threatened species, population or ecological community listed under the FM Act (NSW). A licence is not required if the action is essential to the carrying out of an approved SSI project (section 220ZF of the FM Act (NSW)).

An assessment of the potential impact on threatened species, populations and communities listed under the FM Act (NSW), and is presented in this report in accordance with SEARs. This includes assessment of significance against the factors listed in section 220ZZ of the FM Act (NSW). An assessment of the potential impacts to areas of key fish habitat and Key Threatening Processes also forms part of this assessment.

2.2.2 *Water Management Act 2000*

The *Water Management Act 2000* (NSW) (WM Act) is the main piece of legislation used to manage water in NSW. The main objective of the WM Act is to protect water resource for the State to benefit both short and long-term water use. The objectives that are related to the management of aquatic ecosystems include:

- to apply the principles of ecologically sustainable development
- to protect, enhance and restore water sources, their associated ecosystems, ecological processes and biological diversity and their water quality
- to integrate the management of water sources with the management of other aspects of the environment, including the land, its soil, its native vegetation and its native fauna
- to encourage best practice in the management and use of water.

Section 89 of the WM Act relates to water use approvals and section 90 relates to water management works approvals. There are three kinds of water management work approvals, namely, water supply work approvals, drainage work approvals and flood work approvals.

Under Section 91 of the WM Act a controlled activity approval is required for certain types of developments and activities that have the potential to affect water quality that are carried out at a specified location in, on or under waterfront land.

However, under section 5.23 of the EP&A Act, a water use approval, water management works or an activity approval (including a controlled activity approval) under sections 89, 90 and 91 of the WM Act are not required for SSI projects. The design and construction of the amended project would consider the NSW Department of Planning and Environment (DPE) guidelines for controlled activities for riparian corridors and watercourse crossings on waterfront land (refer to section 2.2.5 and section 2.2.6) to enable the mitigation of potential impacts to hydrology and water quality.

2.2.3 *Policy and guidelines for fish habitat conservation and management (Update 2013) (Department of Primary Industries, 2013)*

The *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries, 2013) provides policies and guidelines to maintain and enhance fish habitats for native and threatened species in marine, estuarine, and freshwater environments. It also:

- defines key fish habitat for the purposes of the FM Act (NSW)
- outlines the requirements of an aquatic ecology assessment for impacts to fish or key fish habitats
- establishes the policy position of no net loss of key fish habitat, and requirements for offsets where impacts cannot be avoided. This includes a minimum 2:1 offset for the total area of the three 'types' of key fish habitat lost (as defined in the policy) to help redress direct and indirect impacts of development
- outlines the specific policy and guidelines for the design and construction of fish friendly watercourse crossings.

The policy considers the classification of a watercourse according to habitat sensitivity (type) and characteristics for fish passage (Class), which is adapted from *Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings* (Fairfull and Witheridge, 2003). This uses the following classifications:

- type one (highly sensitive key fish habitat), Type two (moderately sensitive key fish habitat) and Type three (minimally sensitive key fish habitat)
- class one (major key fish habitat), class two (moderate key fish habitat), class three (minimal key fish habitat) and class four (unlikely key fish habitat).

All watercourse crossings would be designed, installed and maintained in accordance with the *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries, 2013).

Under this policy, NSW DPIRD generally require riparian buffers to be established and maintained for developments or activities in or adjacent to type one or two habitats or class one to three waterways. The policy states that this requirement does not apply to developments involving the maintenance to existing, or construction of new roads or bridges crossing a watercourse, but applies to developments involving roads that are adjacent to, but do not cross a watercourse (with examples listed as subdivisions, rezonings or new road developments). The policy provides a guide for the recommended riparian buffer zone on the habitat type and waterway class:

- type one class one: 100 metres
- type two class two: 50 metres
- type three class four-three: 10 to 50 metres.

The design of the riparian buffer zone is to incorporate the maintenance of lateral connectivity between aquatic and riparian habitat. It states that the installation of infrastructure should be avoided or minimised, that any development should ensure that existing native vegetation is retained to the greatest extent possible, that revegetation should use local native species and that stabilisation and re-establishment of disturbed areas should include weed control and should be monitored.

2.2.4 *Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (Fairfull and Witheridge 2003)*

The *Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings* (Fairfull and Witheridge, 2003) sets out the requirements for the design and construction of fish friendly watercourse crossings in NSW.
All watercourse crossings would be designed, installed and maintained in accordance with this guideline.

2.2.5 *Controlled activities – Guidelines for riparian corridors on waterfront land (NSW Department of Climate Change, Energy, the Environment and Water, 2025a)*

The *Controlled activities – Guidelines for riparian corridors on waterfront land* (NSW Department of Climate Change, Energy, the Environment and Water, 2025a) provides information on defining the riparian corridor (RC) which is now combined with the vegetated buffer into a single vegetated riparian zone (VRZ). The width of the VRZ is based on watercourse order as classified under the Strahler System of ordering watercourses.

The objectives of the guideline that are relevant to the amended project include:

- minimise disturbance and harm to the recommended RC/VRZ
- minimise the number of creek crossings and provide perimeter road separating development from the RC/VRZ
- locate services and infrastructure outside of the RC/VRZ. Within the RC/VRZ provide multiple service easements and/or utilise road crossings where possible
- treat stormwater run-off before discharging into the RC/VRZ.

The amended project is an essential service and therefore project activities can occur on waterfront land and in riparian corridors with consideration of the above objectives.

VRZ width on either side of the watercourse depends on the Strahler Order of the watercourse which includes:

- first order has a 10 metre VRZ width
- second order has a 20 metre VRZ width
- third order has a 30 metre VRZ width
- fourth order and above has a 40 metre VRZ width.

In cases where a watercourse does not exhibit the features of a defined channel with bed and banks, the NSW DCCEEW may determine that the watercourse is not waterfront land for the purposes of the WM Act. The implementation of this guideline for this amended project is discussed further in section 5.1.2.

2.2.6 *Controlled activities – Guidelines for watercourse crossings on waterfront land (NSW Department of Climate Change, Energy, the Environment and Water, 2025b))*

The *Controlled activities – Guidelines for watercourse crossings on waterfront land* (NSW Department of Climate Change, Energy, the Environment and Water, 2025b)relates to the design and construction of watercourse crossings and ancillary works, such as roads on waterfront land. Crossings have the potential to disrupt the hydrologic, hydraulic, and geomorphic functions of a watercourse affecting flows, bed and bank stability and the ecological values and functions of the riparian corridor.

The guideline is to be read in conjunction with the *Controlled activities – Guidelines for riparian corridors on waterfront land* (NSW Department of Climate Change, Energy, the Environment and Water, 2025a) (refer to section 2.2.5). The *Controlled activities – Guidelines for watercourse crossings on waterfront land* (NSW Department of Climate Change, Energy, the Environment and Water, 2025b) proposes that bed level crossings or bridges which fully span the watercourse channel provide the best opportunities for maintaining channel functions. The design and construction of crossings should consider as a minimum:

- maintaining natural geomorphic processes
- maintain natural hydrologic regimes, and
- protect against scour.

The amended project would involve multiple access tracks which have the potential to intersect with watercourses and transmission line structures may be located within lower order streams (first, second and third order).
The implementation of this guideline for this amended project is discussed further in section 5.1.2.

3 Methodology

3.1 Overview

To inform this assessment, the following key steps and tasks were carried out:

- a desktop review and collation of publicly available data, including national and state databases and publicly available reports on the Murray-Darling Basin
- a review of applicable legislation and policy for assessing aquatic ecology, particularly the requirements set out in *Policy and Guidelines for Fish Habitat Conservation and Management (Update 2013)* (Department of Primary Industries, 2013) used to protect aquatic habitats
- an assessment of the potential threatened species and ecological communities that may be present within the amended study area
- field surveys were undertaken post EIS exhibition to provide insight into crossing specific impacts
- an assessment of the potential impacts of the amended project on the aquatic sensitive receptors (including threatened aquatic species and communities and key fish habitat during both construction and operation
- identification of project mitigation measures, during both construction and operation, to address any potential impacts of the amended project to aquatic ecology
- review of issues raised by NSW DPIRD Fisheries in their EIS submission.

3.2 Amended study area

The aquatic ecology amended study area includes all the watercourses within the amended project footprint, including a 50-metre buffer, to capture habitat impacts (amended study area). This captures watercourses crossings that are proposed or impacted during the construction and/or operation of the amended project.

A broader search area that encompassed the amended project footprint plus 10 kilometres was conducted to determine threatened fish species likely to inhabit watercourses within the amended study area (threatened species search area) as few large-scale fish studies have recently been completed.

3.3 Database and literature review

A search of publicly available databases was conducted to identify aquatic ecology values present within the amended study area. The following publicly available databases were accessed in April 2026:

- Fisheries Spatial Data Portal (Department of Primary Industries , 2026)
- EPBC Act (Cth) protected matters search tool (Department of Climate Change, Energy, the Environment and Water, 2026)
- Atlas of Living Australia (Atlas of Living Australia, 2025)
- NSW BioNet (NSW Government, 2026b)
- Groundwater dependent ecosystems atlas (Bureau of Meteorology, 2024) (only river base flow groundwater dependant ecosystems are included in this report).

The aquatic habitats within the amended study area were assessed against the following policy and guidelines for fish habitat conservation and management:

- *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries, 2013)
- *Why Do Fish Need to Cross the Road? Fish Passage Requirements for Watercourse Crossings* (Fairfull & Witheridge, 2003)
- *Aquatic Ecology in Environmental Impact Assessment – EIA Guideline* (Department of Planning, 2003)
- *Controlled activities – Guidelines for riparian corridors on waterfront land* (NSW Department of Climate Change, Energy, the Environment and Water, 2025a)
- *Controlled activities – Guidelines for watercourse crossings on waterfront land* (NSW Department of Climate Change, Energy, the Environment and Water, 2025b)

3.4 Likelihood of occurrence assessment

The likelihood of occurrence of threatened aquatic species and endangered ecological communities (EEC) was assessed by considering habitat requirements of the species, habitat connectivity and records of historical and recent presence. Likelihood criteria are shown in Table 3.1.

Relevant databases were searched in April 2026 for records of threatened aquatic fauna species and significant aquatic habitat (i.e. key fish habitat). This review was used to prepare a list of threatened or migratory aquatic species and any significant habitat previously recorded or predicted to occur in the amended study area and the broader locality. The likelihood of occurrence assessment was subsequently updated based on the field survey completed for *Technical paper 1 – Revised Biodiversity Development Assessment Report* (WSP 2026a) and the results and information obtained from the watercourse surveys undertaken in September and October 2026.

Table 3.1 Likelihood of occurrence criteria for threatened flora and fauna species

Likelihood	Description
Low	Species or the EEC are considered to have a low likelihood of occurrence include species that: — have not been recorded previously in the amended study area and surrounds and for which the amended study area is beyond the current distribution range — rely on specific habitat types or resources that are not present in the amended study area — are considered locally extinct.
Moderate	Species or the EEC are considered to have a moderate likelihood of occurrence include species that: — have infrequently been recorded previously in the amended study area and surrounds — use habitat types or resources that are present in the amended study area, although generally in a poor or modified condition — are unlikely to maintain sedentary populations, however, may seasonally use resources within the amended study area opportunistically during variable seasons or migration.
High	Species or the EEC are considered to have a high likelihood of occurrence include species that: — have frequently been recorded previously in the amended study area and surrounds — use habitat types or resources that are present in the amended study area, that are abundant and/or in good condition within the amended study area — are known or likely to maintain resident populations surrounding the amended study area — are known or likely to visit the amended study area during regular seasonal movements or migration.

3.5 Field surveys and assessment

The amended project is a large scale project that has a footprint that crosses multiple watercourses ranging from good key fish habitat to drainages unlikely to support aquatic fauna for the majority of the year. The majority of the project infrastructure is not expected to directly impact instream habitat features, instead will be strung above the watercourse with the outside of the riparian area and VRZ. As such it is not expected that the majority of watercourses crossed by the amended project will result in direct impact to the aquatic ecosystem. However, access tracks constructed to provide access to the amended project infrastructure, may result in direct impacts to aquatic habitats when crossing a watercourse. These impacts may result in the removal of key fish habitat, resulting in offsetting requirements as outlined in the FM Act and *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries, 2013). The report will only focus on the project elements that will result in direct impacts to watercourse, therefore not every watercourse crossed by the amended project footprint will be assessed in detail. The detailed assessment of each crossing will be limited to access tracks, as this project feature may directly impact aquatic habitats.

3.5.1 Watercourses surveyed based on EIS project

Field surveys were conducted between 22 September and 1 October 2025 and were based on the watercourse crossings proposed as part of the EIS project. Of the 67 watercourse crossings proposed as part of the EIS project, only 33 watercourse crossings were surveyed (including 28 from the NSW/Victorian border to the Dinawan substation component of the project and five from the network augmentation works component). The remaining 34 were not able to be surveyed due property access issues, and as such are subject to desktop assessment only. Additional and/or changed watercourse crossings identified as part of the amended project were assessed though desktop assessment or extrapolation from survey sites. Watercourse crossings that are directly impacted by the amended project, such as the construction of access tracks, have been individually assessed. As the amended project footprint differed from the EIS project footprint, some of the assessed watercourse crossings are no longer impacted by the amended project, as such are not included in this report. Moving forward this assessment would only address watercourse crossing impacted by the amended project footprint.

3.5.2 Watercourses assessed based on amended project

A total of 98 watercourses (not specific watercourse crossings) within the amended project footprint are to be crossed by either the transmission line corridor and/or access tracks. Thirty-five of these watercourses are expected to be crossed by access tracks and 63 would be crossed only by the transmission line corridor.

Criteria for inclusion in this assessment is as follows:

1. Is key fish habitat and/or
2. Is mapped habitat for threatened aquatic fauna and/or
3. Is a Strahler order 3 or greater watercourse and
4. Is to be physically impacted by the amended project (i.e. access tracks or track upgrades).

Watercourses crossed only by the transmission line corridor (63 watercourses) are not expected to incur direct impacts, as the transmission line structures are expected to be constructed at least 50 metres from the edge of the higher order watercourses (Strahler 4 or greater). As such each crossing has not been assessed in detail, however, overall assessment of line stringing is assessed in section 5.1.1.

Of the 35 watercourses to be crossed by access tracks, 16 watercourses are mapped as key fish habitat (15 are within the NSW/Victorian border to the Dinawan substation component of the project and one are within the network augmentation works component). Of the 35 watercourses to be crossed by access tracks , 30 watercourses are mapped as intersecting Murray Hardyhead habitat, five intersecting Silver Perch habitat, two intersecting Murray Crayfish and three intersecting Flathead Galaxias. As some of the 35 watercourses are set to be crossed multiple times, a total of 48 watercourse crossings along the 35 watercourses were separately assessed. Each watercourse crossing may contain specific habitat values essential for the survival of aquatic species, hence once assessment on a watercourse may not suffice. Table 3.2 below outlines the 48 watercourse crossings assessed in Table 3.2 and shown in Figure 4.3. Not all existing watercourse crossings associated with access tracks would require upgrading as part of the amended project, but for the purposes of this assessment it has been assumed they would require upgrading.

Habitat characterisation, key fish habitat assessment, riparian health and water quality were assessed at each location to determine the ecological importance of each watercourse. The results were used to determine the likelihood of aquatic species occurrence/presence and to confirm key fish habitat. Macroinvertebrates or aquatic vertebrates were not collected as a part of this assessment, and only incidental observations were recorded.

Table 3.2 Watercourses assessed

Site (ID)	TopoID	Watercourse	Key fish habitat	Threatened species	Stream order	Project feature	Assessment method
WC36	500207234	Unnamed watercourse	No	Murray Hardyhead	1	Access track to be upgraded	Site Visit
WC17	514749747	Unnamed watercourse	Yes	Murray Hardyhead	1	Access track to be upgraded	Site Visit
WC18	500209696	Jaffrey Creek	Yes	Murray Hardyhead Flathead Galaxias Murray Spiny Crayfish	10	Access track to be upgraded	Extrapolated
WC21a	500209789	Unnamed watercourse	No	Murray Hardyhead	1	New access track	Extrapolated
WC21b	500209789	Unnamed watercourse	No	Murray Hardyhead	1	Access track to be upgraded	Extrapolated
WC31	500202308	Southern No 26	No	Murray Hardyhead	0	New access track	Site Visit
WC34a	515443220	Coleambally Outfall Drain	Yes	Murray Hardyhead	9	New access track	Site Visit
WC34b	515443220	Coleambally Outfall Drain	Yes	Murray Hardyhead Silver Perch	9	Access track to be upgraded	Site Visit
WC29	503921558	Carroonboon Creek	No	Murray Hardyhead	2	New access track	Site Visit
WC40	515390563	Unnamed watercourse	No	Murray Hardyhead	0	New access track	Site Visit
WC41	515390563	Unnamed watercourse	No	Murray Hardyhead	0	Access track to be upgraded	Site Visit
WC04	503921525	Unnamed watercourse	No	Murray Hardyhead	2	Access track to be upgraded	Site Visit
WC05	503921514	Carroonboon Creek	No	Murray Hardyhead	1	Access track to be upgraded	Site Visit
WC32	503921506	Unnamed watercourse	Yes	Murray Hardyhead	0	Access track to be upgraded	Site Visit
WC33	515393785	Unnamed watercourse	No	Murray Hardyhead	0	New access track	Site Visit
WC06	514830725	Unnamed watercourse	No	Murray Hardyhead	1	Access track to be upgraded	Extrapolated

Site (ID)	TopoID	Watercourse	Key fish habitat	Threatened species	Stream order	Project feature	Assessment method
WC07	514830607	Carroonboon Creek	Yes	Murray Hardyhead	3	Access track to be upgraded	Extrapolated
WC44	514823353	Delta Creek	Yes	Flathead Galaxias Silver Perch	3	New access track	Extrapolated
WC48	517048299	Delta Creek	Yes	Flathead Galaxias Silver Perch	3	New access track	Extrapolated
WC49	517048299	Delta Creek	Yes	Flathead Galaxias Silver Perch	3	New access track	Extrapolated
WC47	514837360	Delta Creek	Yes	Flathead Galaxias Silver Perch	3	Transmission line	Extrapolated
WC45	514837419	Delta Creek	Yes	Flathead Galaxias Silver Perch	3	Access track to be upgraded	Extrapolated
WC46	514837419	Delta Creek	Yes	Flathead Galaxias Silver Perch	3	New access track	Site Visit
WC53	517027560	Unnamed watercourse	Yes	N/A	3	Access track to be upgraded	Site Visit
WC54	500837738	Unnamed watercourse	Yes	N/A	3	Access track to be upgraded	Site Visit
New WC01	514749992	Unnamed watercourse	No	Murray Hardyhead	1	New access track	Desktop Assessment
New WC02	500201767	Unnamed watercourse	No	Murray Hardyhead	1	New access track	Desktop Assessment
New WC03	500209810	Magpie Creek	Yes	Murray Hardyhead	2	Access track to be upgraded	Desktop Assessment
New WC04	515357844	Magpie Creek	Yes	Murray Hardyhead	2	Access track to be upgraded	Desktop Assessment
New WC05	500202374	Unnamed watercourse	No	Murray Hardyhead	3	New access track	Desktop Assessment
New WC06	500204586	Unnamed watercourse	No	Murray Hardyhead	1	New access track	Desktop Assessment

Site (ID)	TopoID	Watercourse	Key fish habitat	Threatened species	Stream order	Project feature	Assessment method
New WC07	515078139	Berambong Creek	Yes	Murray Hardyhead Silver Perch	10	New access track	Desktop Assessment
New WC08	517049290	Unnamed watercourse	No	Murray Hardyhead	1	Access track to be upgraded	Desktop Assessment
New WC11	500205369	Unnamed watercourse	No	Murray Hardyhead	0	New access track	Desktop Assessment
New WC12	503909019	Moores Creek	No	Murray Hardyhead	1	Access track to be upgraded	Desktop Assessment
WC01	500205153	Unnamed watercourse	No	Murray Hardyhead	1	New access track	Desktop Assessment
WC02	500205126	Unnamed watercourse	No	Murray Hardyhead	1	New access track	Desktop Assessment
WC08	500207683	Unnamed watercourse	No	Murray Hardyhead	1	New access track	Desktop Assessment
WC09	500209348	Unnamed watercourse	No	Murray Hardyhead	1	Access track to be upgraded	Desktop Assessment
WC14	500209369	Unnamed watercourse	No	Murray Hardyhead	1	Access track	Desktop Assessment
WC16	500209119	Larrys Creek	Yes	Murray Hardyhead	10	Access track to be upgraded	Desktop Assessment
WC19	517068882	Wyam Creek	Yes	Murray Hardyhead Flathead Galaxias Silver Perch Murray Crayfish	10	Access track to be upgraded	Desktop Assessment
WC22	500209176	Unnamed watercourse	No	Murray Hardyhead	0	Access track to be upgraded	Desktop Assessment
WC24	517070015	Dead Mans Creek	Yes	Murray Hardyhead	10	New access track	Desktop Assessment
WC35	500207342	Unnamed watercourse	No	Murray Hardyhead	0	Access track to be upgraded	Desktop Assessment
WC37	500207150	Unnamed watercourse	No	Murray Hardyhead	0	New access track	Desktop Assessment
WC38	500207150	Unnamed watercourse	No	Murray Hardyhead	0	Access track to be upgraded	Desktop Assessment
WC59	500208658	Larrys Creek	Yes	Murray Hardyhead	10	New access track	Desktop Assessment

3.5.3 Habitat assessment

During the survey the habitat characteristics of each surveyed watercourse were identified. The presence, absence and/or quality of each habitat characteristic determined the overall quality of the aquatic ecosystem. Watercourses mapped as key fish habitat or a Strahler Order >2 underwent a detailed assessment which included broad measurement and descriptions of the following habitat characteristics to determine the quality of attributes of the local ecosystem:

- riparian vegetation condition, including cover and presence of introduced plants and weeds
- morphological description of the stream (i.e. stream gradient, channel morphology)
- instream features (i.e. snags, aquatic vegetation, rocks, woody debris)
- description of bank features (i.e. stability, morphology)
  - the banks of the watercourse are defined as right or left relative to a view downstream
- watercourse measurements (i.e. wetted and bank full width, flow velocity)
- identification of sensitive habitat features as described by Department of Primary Industries (2013)
- identification of fish habitat features
- fish passage barriers.

When access permitted, a reach of around 450 to 550 metres including, the crossing location, one upstream location and two downstream locations were assessed. The upstream location acts as a reference point for the amended project, whereas the downstream sample points were used to determine the extent of potential impacts. In areas with limited access modified assessments (decreased survey locations and / or distance) were completed. In watercourses that did not exhibit defined banks or a channel, bank measurements or a description of banks were not included. Refer to Appendix C for a copy of the habitat assessments.

Photographs were taken at all sites to provide a record of habitat conditions.

3.5.4 Key fish habitat

The *Policy and Guidelines for Fish Habitat Conservation and Management* (Department of Primary Industries , 2013) define fish habitat sensitivity as “importance of the habitat to the survival of fish”. The watercourse class and sensitivities of fish habitat are determined by the functionality of the watercourse as fish passage (Department of Primary Industries, 2013). Using the characteristics outlined in Table 3.3 and Table 3.4, each watercourse was assigned a sensitivity ranking (watercourse type) and water classification (watercourse class).

The combination of the type and class of each watercourse assigned to the surveyed watercourses informed the impact assessment and identification of the required mitigation measure and/or potential design changes that would be required to ensure key fish habitat is protected and maintained as per the requirements of the FM Act.

Table 3.3 Key fish habitat and associated sensitivity classification

Fish habitat sensitivity	Characteristics of watercourse type (freshwater only)
Type 1 – highly sensitive	— wetlands recognised under international agreements — wetlands listed in the Directory of Important Wetlands of Australia — freshwater habitats that contain in-stream gravel beds, rocks greater than 500 mm in two dimensions, snags greater than 300 millimetres in diameter or three metres in length, or native aquatic plants — any known or expected protected or threatened species habitat or area of declared 'critical habitat' under the FM Act.
Type 2 – moderately sensitive	— freshwater habitats and brackish wetlands, lakes and lagoons other than those defined in type one — weir pools and dams up to full supply level where the weir or dam is across a natural watercourse.
Type 3 – minimal sensitivity	— unstable or unvegetated sand or mud substrate — freshwater habitats not included in types one or two — ephemeral aquatic habitat not supporting native aquatic or wetland vegetation.

Source: Department of Primary Industries, 2013

Table 3.4 Classification of watercourses for fish passage

Classification	Characteristics of watercourse class
Class 1 – major key fish habitat	Marine or estuarine watercourse or permanently flowing or flooded freshwater watercourse habitat of a threatened or protected fish species or 'critical habitat'.
Class 2 – moderate key fish habitat	Non-permanently flowing stream, creek or watercourse with clearly defined bed and banks with semi-permanent to permanent waters in pools or is connected wetland areas. Freshwater aquatic vegetation is present. type one and two habitats present.
Class 3 – minimal key fish habitat	Named or unnamed watercourse with intermittent flow and sporadic refuge, breeding or feeding areas for aquatic fauna. Semi-permanent pools form within the watercourse or adjacent wetlands after a rain event. Otherwise, any minor watercourse that interconnects with wetlands or other class one–three fish habitats.
Class 4 – unlikely key fish habitat	Watercourse (generally unnamed) with intermittent flow following rain events only, little or no defined drainage channel, little or no flow or free-standing water or pools post rain events (e.g. dry gullies or shallow floodplain depressions with no aquatic flora present).

Source: Department of Primary Industries, 2013

3.5.5 Water quality

In-situ water quality measurements were taken at each survey location using a handheld YSI ProDSS. Water quality measurements were obtained at around two thirds of the watercourses' depth and recorded turbidity (NTU), dissolved oxygen (per cent), pH, temperature (°C) and conductivity (µs/cm). These measurements were used to determine if the water quality at each survey site could support fish and other aquatic species.

4 Results

4.1 Existing environment

The amended project is located within the Murray-Darling Basin and spans across two catchment areas. The most western portion of the amended project spans north from the Murray River to Edward River and the portion of the alignment from Coleambally Outfall Dam to 10 kilometres east of the Cobb Highway is located within the Central Murray catchment. The rest of the amended project is located within the Murrumbidgee catchment as are all of the network augmentation works components of the amended project (Murray-Darling Basin Authority, 2025; Murray-Darling Basin Authority, 2025a).

The central Murray catchment includes the longest river in Australia, the Murray River. This river spans 2,500 kilometres starting at Mount Kosciuszko in the Australian Alps to the Southern Ocean at Goolwa in South Australia. Of the three catchments that make up the Murray River, the central Murray catchment is roughly 1,200 kilometres long and makes up three per cent of the total area of the Murray-Darling Basin and is considered to be a broad floodplain that regularly floods (Murray–Darling Basin Authority, 2025). The average rainfall within this catchment is highest in the east (700 millimetres) and decreases as the river flows west toward Mildura (300 millimetres to 500 millimetres). Historically this catchment supported a large diversity of native fish, but as a result of the decline in stream health resulting from increased blackwater events, reduced water quality, and the impact of droughts on river flow there has been a decrease in native fish populations (Koehn, 2022).

The Murrumbidgee River is the third longest river in Australia which spans 1,485 kilometres starting in the Australian Alps to the Murray River near Balranald. This catchment makes up eight per cent of the total area of the Murray-Darling Basin (Murray–Darling Basin Authority, 2025a). The average rainfall within this catchment is the highest within the alpine regions (1,600 millimetres) and decreases as the river flows west towards the Murray River (350 millimetres). The Murrumbidgee River provides water to various wetlands within the catchment including 16 nationally significant wetlands.

The Murray-Darling Basin Authority released a report in 2012 that rated the ecosystem health of the catchments within the basin (Murray–Darling Basin Authority, 2012). This assessment determined that the overall ecosystem health rating for the central Murray and the Murrumbidgee catchment were both rated as poor. The rating for each biological theme is outlined in Table 4.1.

Table 4.1 Ecosystem health rating for Central Murray and Murrumbidgee catchment

Biological theme	Central Murray catchment	Murrumbidgee catchment
Fish	**Very Poor:** This area has experienced a reduction in number of native fish species, however, 84 per cent of all fish captured were native species. The native fish that were captured were mostly small bodied as they only made up 44 per cent of the total biomass captured, suggesting the invasive species capture were larger fish.	**Extremely Poor**: This area has experienced reduced numbers of native fish with invasive species making up 84 per cent of the biomass sampled. Recruitment of 10 of the 12 native species in the valley area has been observed.

Biological theme	Central Murray catchment	Murrumbidgee catchment
Macroinvertebrates	**Poor:** Of the sites surveyed only six per cent were in good condition and 47 per cent were rated as poor. This catchment contained 55 per cent of all macroinvertebrate families found within the Murray–Darling Basin.	**Moderate:** This area has experienced a reduction in family biomass, however, the catchment contained 78 per cent of all families found within the Murray–Darling Basin.
Vegetation	**Good:** The riparian vegetation within this area is in good condition	**Moderate:** Vegetation in the montane and lowland areas is in good condition whereas the slope zones experience a lack of native vegetation.
Physical Form	**Moderate:** This catchment exhibits signs of channel simplification; however, bank morphology was rated good. Channel form, bed and floodplain dynamic were all deemed to be of moderate condition.	**Good:** The morphology of the river including river channel form and bank dynamics were rated as good whereas the streambed and floodplain dynamics were moderately rated.
Hydrology	**Poor:** Large difference in flow seasonality and variability and moderate alteration in high over-bank floods, low over-bank floods, flow variability and low- and zero-flow events	**Poor:** Large difference in flow variability and low and zero-flow events and flow gross volume and moderate difference in flow seasonality.
Overall Ecosystem Health	**Poor**	**Poor**

Source: (Murray–Darling Basin Authority, 2012)

4.2 Database search

4.2.1 River-based groundwater dependant ecosystems

Groundwater dependent ecosystems (GDEs) are communities of plants, animals, and other organisms whose extent and life processes are dependent on groundwater. GDEs include a diverse range of ecosystems, from those entirely dependent on groundwater to those that may use groundwater while not having a dependency on it for survival (i.e. ecosystems or organisms that use groundwater opportunistically or as a supplementary source of water) (Hatton & Evans, 1998).

There are six GDE classifications that are distinguished by geography settings, and these include:

1. terrestrial vegetation
2. river base flow system
3. aquifer and cave ecosystems
4. wetlands
5. terrestrial fauna
6. estuarine and near-shore marine ecosystems.

For the purpose of this assessment only the potential for river base flow system GDEs are discussed. The river base flow system GDEs are the most likely GDEs to directly interact with watercourses, resulting in potential interactions with aquatic habitats. According to the Groundwater Dependent Ecosystems Atlas (2024), 11 watercourse crossings in the amended footprint area are identified as containing aquatic GDEs (Figure 4.1).

The 11 watercourses in the amended study area containing aquatic GDEs are:

- Big Spring Creek (moderate potential GDE)
- Coxs Creek (moderate potential GDE)
- Foleys Gully (high potential GDE)
- Merran Creek (moderate potential GDE)
- Murray River (moderate potential GDE)
- Niemur River (moderate potential GDE)
- Tywong Creek (high potential GDE)
- Unnamed watercourse: TopoID 500207060 (unclassified potential GDE)
- Unnamed watercourse: TopoID 500209400 (moderate potential GDE)
- Unnamed watercourse: TopoID 500837693 (moderate potential GDE)
- Wakool Creek (moderate potential GDE).

River base flow systems have a component of base flow which originates from groundwater discharge. The base flow is not solely comprised of groundwater discharge, it also includes bank storage and lateral unsaturated movement, however, the majority of the volume originates from groundwater. The dependency of an ecosystem on groundwater can be determined by the volume of this baseflow and its variability as opposed to the mean annual flow of the river (Hatton & Evans, 1998). The quality of groundwater that discharges into the associated watercourse is a factor that determines the overall health of the watercourse therefore care would need to be taken during works that have potential of interacting with groundwater. Mitigation measures used to manage groundwater impacts are included in *Technical paper 10 – Groundwater impact assessment* (WSP, 2025).

Technical paper 10 – Groundwater impact assessment (WSP, 2025) identifies that the high priority GDEs are terrestrial GDEs and that there is limited groundwater-surface water connectivity within the groundwater amended study area (which is larger than the aquatic ecology amended study area), with connectivity generally limited to recharge of groundwater via leakage from overlying surface water features. *Technical paper 10 – Groundwater impact assessment* (WSP, 2025) concluded that any change in groundwater levels due to construction or operation of the project is considered a very low risk, and that any change to groundwater quality due to increased salinity arising from groundwater mounding or changes to recharge is considered low. As such, no further assessment of impacts to aquatic GDEs is considered in this assessment. Direct impacts to vegetation associated with river base flow system GDEs is considered further in *Technical paper 1 – Revised Biodiversity Development Assessment Report* (WSP, 2026a).



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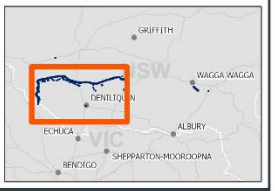
VNI West – Revised Aquatic Assessment
Figure 4.1a
Aquatic GDE overview

Legend

- Amended project footprint
- Watercourse

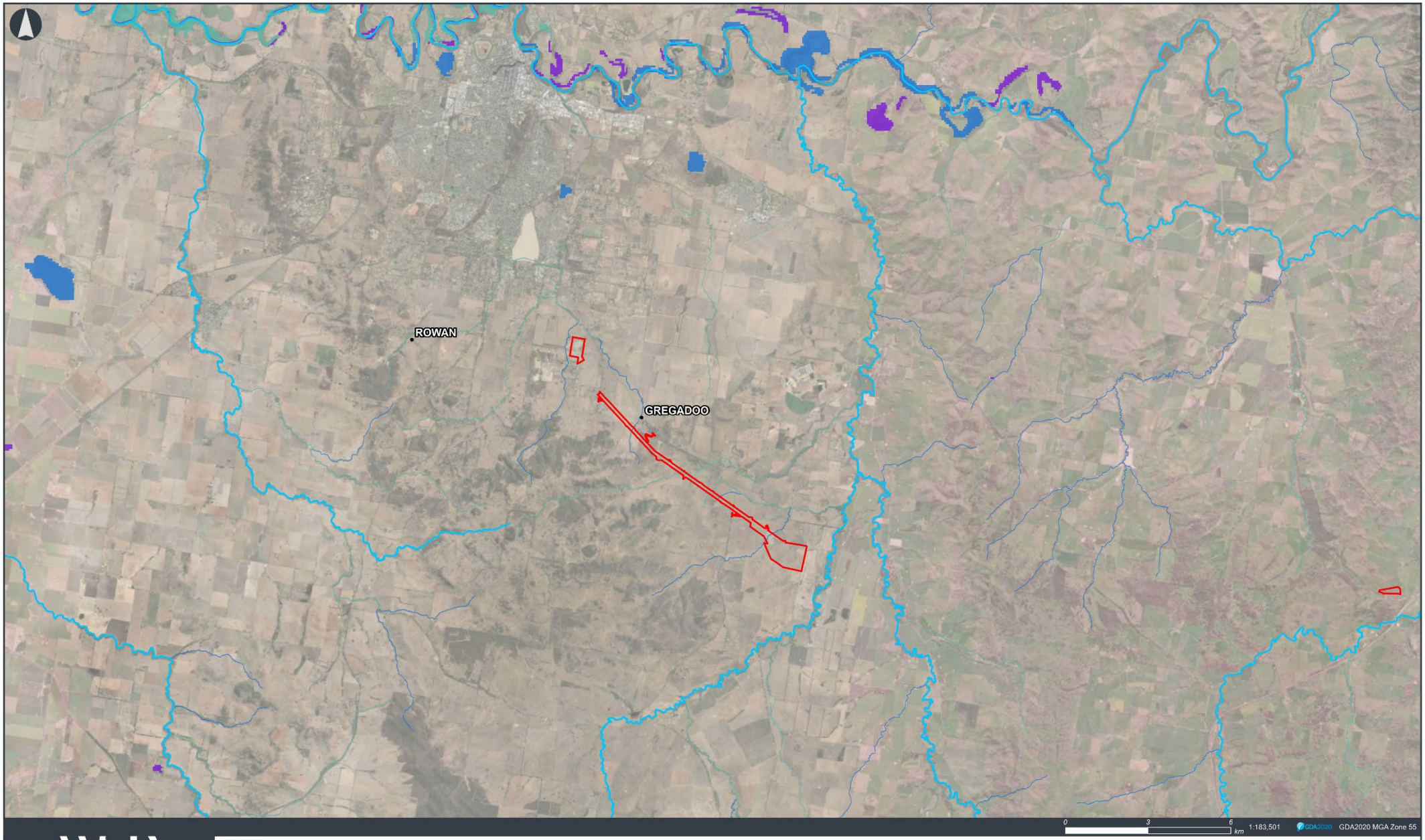
Aquatic GDEs - NSW/Victorian border to Dinawan substation

- High potential GDE - from national assessment
- High potential GDE - from regional studies
- Low potential GDE - from national assessment
- Low potential GDE - from regional studies
- Moderate potential GDE - from national assessment
- Moderate potential GDE - from regional studies
- Unclassified potential GDE - from regional studies



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Data sources: NSW EPI, DELWP, WSP, EnergyConnect



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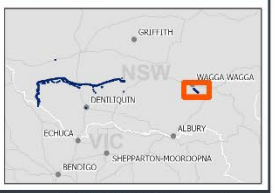
VNI West – Revised Aquatic Assessment
Figure 4.1b
Aquatic GDE overview

Legend

- Amended project footprint
- Watercourse

Aquatic GDEs - Network augmentation works

- High potential GDE - from national assessment
- Low potential GDE - from national assessment
- Moderate potential GDE - from national assessment



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Data sources: NSW EPI, DELWP, WSP, EnergyConnect

4.2.2 Fish habitat within the amended study area

Mapped key fish habitat and the indicative distribution of threatened species are independent of each other. A watercourse can be mapped as not containing key fish habitat but can be mapped as having an indicative distribution of threatened species. This discrepancy may occur as the watercourse does not contain all the habitat features to be deemed to be key fish habitat, or the watercourse has not been fully assessed.

The key fish habitat and associated sensitivity classification scheme is summarised in Table 1 of *the Policy and guidelines for fish habitat conservation and managemen*t (Department of Primary Industries, 2013). Under this scheme any known or expected protected or threatened species habitat or area of declared 'critical habitat' under the FM Act (NSW) is defined as "type one – highly sensitive key fish habitat".

Based on searches of the NSW DPIRD Fisheries Spatial Data Portal (April 2026), the amended study area contains mapped distribution for:

- Flathead Galaxias – EPBC Act (Cth): Critically Endangered, FM Act (NSW): Critically Endangered
- Silver Perch – EPBC Act (Cth): Endangered, FM Act (NSW): Vulnerable
- Murray Hardyhead – EPBC Act (Cth): Endangered, FM Act (NSW): Critically Endangered
- Murray Spiny Crayfish – EPBC Act (Cth): Vulnerable; FM Act (NSW): Vulnerable.

Key fish habitat and mapped distribution of threatened aquatic species occur throughout various named and unnamed watercourses within the amended project footprint for the NSW/Victorian to the Dinawan substation component. This is discussed further in section 4.2.3, and are as listed in Table 4.2 and Table 4.3 and as shown in Figure 4.2.

Key fish habitat is mapped within named and unnamed watercourses within the network augmentation works component of the project including Big Spring Creek and Tywong Creek, and two unnamed watercourses. However, no watercourses within the network augmentation works component are not within the indicative distribution of a threatened aquatic species listed under the EPBC Act (Cth) or FM Act (NSW).

An assessment of the likelihood of occurrence of threatened aquatic species identified was undertaken to determine the potential for these species to occur within the amended project footprint (refer to section 4.2.4.2). It was determined that three species are highly likely and three are moderately likely to inhabit the identified watercourses intersected by the NSW/Victorian border to Dinawan substation component of the project.

4.2.3 Watercourses crossed by the amended project

A total of 22 named watercourses are located within the amended project footprint for the NSW/Victorian border to the Dinawan component are mapped as key fish habitat or are within the indicative distribution of a threatened aquatic species (refer to Figure 4.2). The named watercourses that are crossed by the amended project are outlined in Table 4.2.

The classification of watercourses depends on various factors including type of native aquatic vegetation, habitat structure and streambed composition that the watercourse is associated as outlined in the *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries, 2013).

Although typically exempt from protection under the *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries, 2013), irrigation channels have the potential to provide habitat for listed species, particularly if the irrigation channel is connected a fish bearing watercourse, or is located within a floodplain and contains key fish habitat features. For the purpose of this assessment, if a threatened species is known to inhabit an irrigation channel, has connectivity to a fish bearing watercourse, and /or contains key fish habitat feature that can be accessed by threatened aquatic species these channels would be assessed as key fish habitat.

Table 4.2 Named watercourse crossings within the amended project footprint – NSW/Victorian border to the Dinawan substation

Watercourse name	Strahler order	Mapped key fish habitat	Indicative distribution of threatened species	Number of times the watercourse crosses through the amended project footprint	Project feature crossings (multiple crossings per watercourse is possible)
Berambong Creek	10	Yes	Silver Perch and Murray Hardyhead	1	Access track (1)
Bullockhide Creek	10	Yes	Murray Hardyhead	2	Transmission line (2)
Carroonboon Creek	1, 2 and 3	Yes (Strahler order 3 only)	Murray Hardyhead	4	Access track (3) Transmission line (1)
Coleambally Outfall Drain	9	Yes	Silver Perch and Murray Hardyhead	2	Access track (2) Transmission line (1)
Cunninyeuk Creek	3	Yes	Murray Hardyhead, Silver Perch and Flathead Galaxias	1	Transmission line (1)
Deadmans Creek	10	Yes	Murray Hardyhead	1	Access track (1) Transmission line (1)
Delta Creek	3	Yes	Silver Perch and Flathead Galaxias	6	Access track (6) Transmission line (1)
Edward River	10	Yes	Murray Hardyhead, Silver Perch and Flathead Galaxias	1	Transmission line (1)
Jaffrey Creek	10	Yes	Murray Hardyhead, Silver Perch, Murray Spiny Crayfish and Flathead Galaxias	2	Access track (1) Transmission line (1)
Larrys Creek	10	Yes	Murray Hardyhead	2	Access track (2) Transmission line (1)
Magpie Creek	2	Yes	Murray Hardyhead	3	Access track (2) Transmission line (1)

Watercourse name	Strahler order	Mapped key fish habitat	Indicative distribution of threatened species	Number of times the watercourse crosses through the amended project footprint	Project feature crossings (multiple crossings per watercourse is possible)
Mallan Branch Canal	0[1]	No	Murray Hardyhead	1	Transmission line (1)
Merran Creek	10	Yes	Murray Hardyhead	1	Transmission line (1)
Moores Creek	1, 2	No	Murray Hardyhead	2	Transmission line (2)
Murray River	10	Yes	Silver Perch, Murray Spiny Crayfish and Flathead Galaxias	1	Transmission line (1)
Niemur River	10	Yes	Silver Perch, Murray Spiny Crayfish and Flathead Galaxias	1	Transmission line (1)
Northern Branch Canal	0[1]	No	Murray Hardyhead	1	Transmission line (1)
Southern No 26 Channel	0[1]	No	Murray Hardyhead	1	Access track (1) Transmission line (1)
Southern No 26 (A) Channel	0[1]	Yes	Murray Hardyhead	1	Transmission line (1)
Wakool River	10	Yes	Murray Hardyhead, Silver Perch, Murray Spiny Crayfish and Flathead Galaxias	1	Transmission line (1)
Wyam Creek	10	Yes	Murray Hardyhead Silver Perch, Murray Spiny Crayfish and Flathead Galaxias	2	Access track (1) Transmission line (1)
Yarrein Creek	10	Yes	Murray Hardyhead Silver Perch, and Flathead Galaxias	2	Transmission line (1)

(1) Watercourses assigned the Strahler Order "0" were assessed as being an independent watercourse that does not flow into a larger hydrological system. These watercourses are typically man-made for agricultural and social uses.

Approximately 55 unnamed watercourses are within the amended project footprint for the NSW/Victorian border to the Dinawan substation component. Of these, 28 unnamed watercourses are mapped as being within the distribution area of Murray Hardyhead habitat and six of these are also mapped as key fish habitat totalling 29 different watercourses (refer to Table 4.3). Table 4.3 also identifies what elements of the amended project that cross or would be constructed within the VRZ.

Table 4.3 Unnamed watercourse crossings within the amended project footprint – NSW/Victorian border to the Dinawan substation

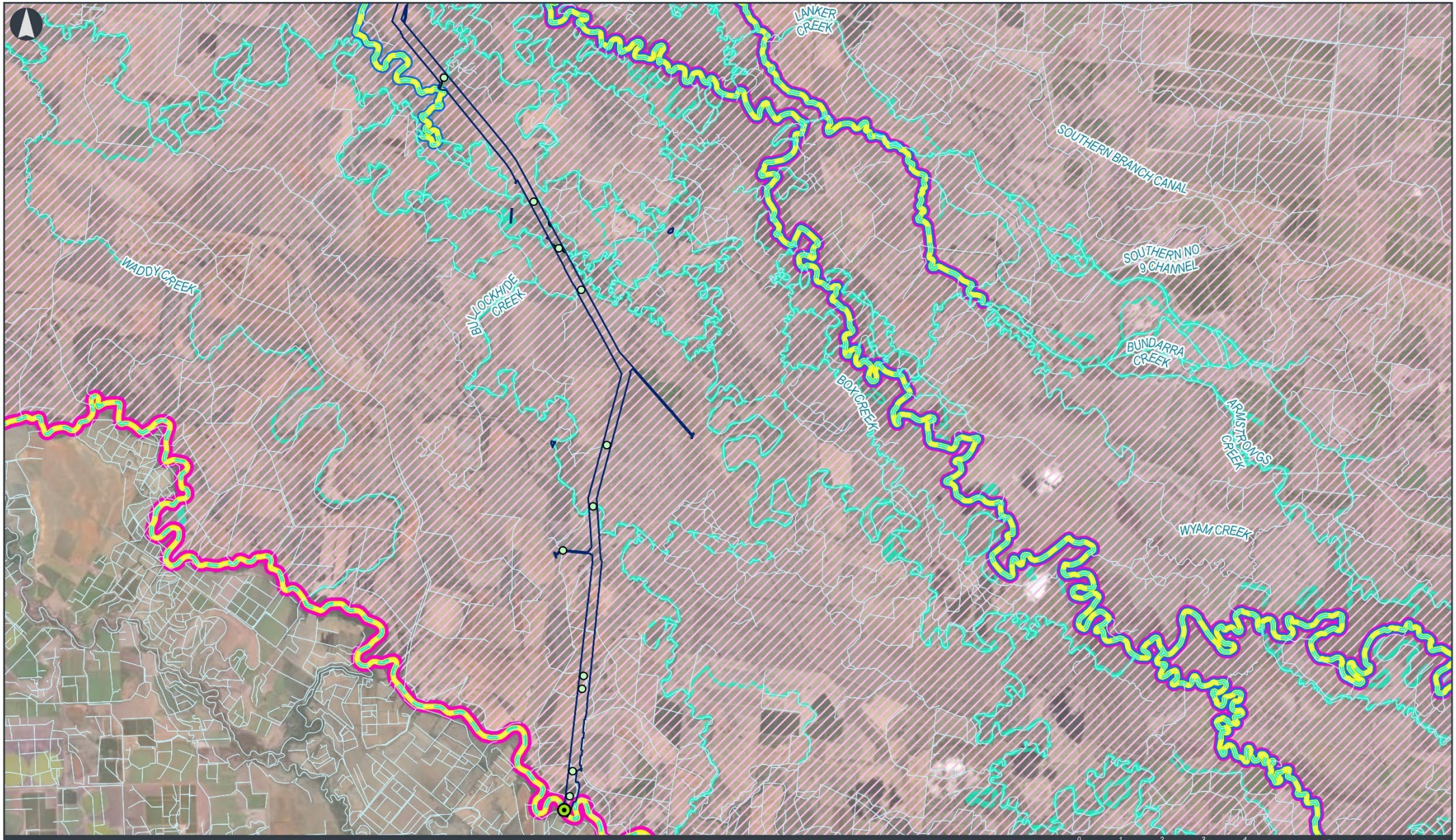
Strahler order	Number of watercourses with the amended project footprint	Number of watercourses with mapped key fish habitat	Number of watercourses with indicative distribution of Murray Hardyhead	Project feature crossings (multiple crossings per watercourse is possible)
0[1]	32	1	12	Access track (31) Transmission line (21) works within buffer associated with 500 kV transmission line construction pad or brake and winch site.
1	17	2	13	Access track (25) Transmission line (10) works within buffer associated with 500 kV transmission line construction pad or brake and winch site.
2	3	0	1	Access track (3) Transmission line (1)
3	1	1	1	Access track (1) Transmission line (1)
9	1	1	0	Access track (1)
10	1	1	1	Access track (1) Transmission line (1)

(1) Watercourses assigned the Strahler Order "0" were assessed as being an independent watercourse that does not flow into a larger hydrological system. These watercourses are typically man-made for agricultural and social uses.

Key fish habitat is mapped within named and unnamed watercourses within the network augmentation works component of the project including Big Spring Creek and Tywong Creek, and two unnamed watercourses. An additional 15 unnamed watercourses and drainage lines and two named watercourses (Cox Creek and Foleys Gully) are expected to be crossed by the network augmentation works, however, these are not mapped as key fish habitat (refer to Table 4.4 and Figure 4.2).

Table 4.4 Watercourses crossings with key fish habitat within the network augmentation works project area

Watercourse name	Strahler order	Mapped key fish habitat	Number of times the watercourse crosses through the amended project footprint	Project feature crossings (multiple crossings per watercourse is possible)
Unnamed watercourse (WC54)	3	Yes	1	Access track (1) Transmission line (1)
Tywong Creek	4	Yes	1	Transmission line (1)
Unnamed watercourse (WC53)	3	Yes	1	Access track (1) Transmission line (1)
Big Spring Creek	4	Yes	1	Transmission line (1)



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VNI West – Revised Aquatic Assessment
Figure 4.2
Mapped threatened species habitat crossed within the VNI Project

Legend

Strahler stream order within footprint
- 0
- 1
- 10

Watercourse

Amended project footprint

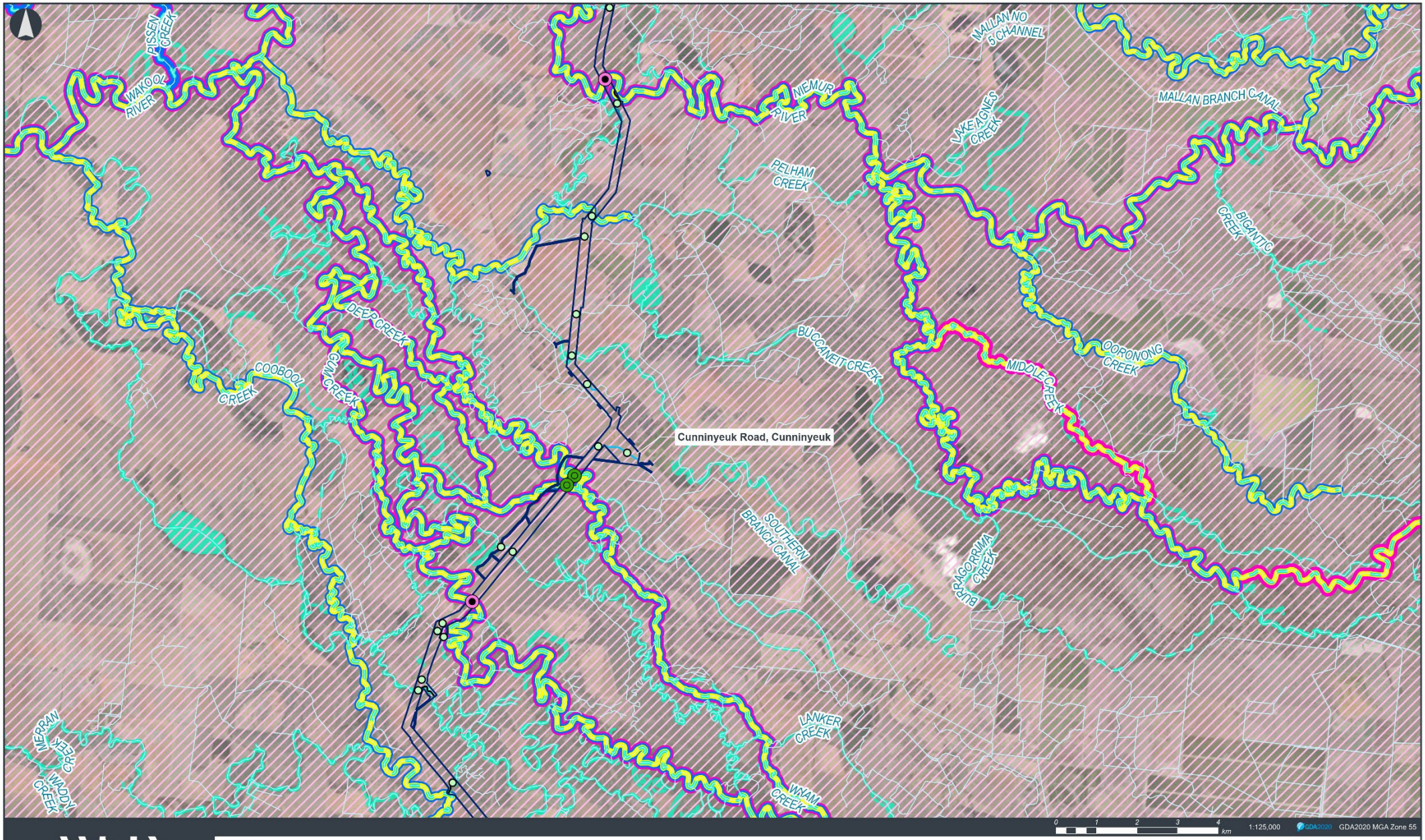
Potential occurrence for threatened fish
- Murray hardyhead
- Silver perch, murray crayfish, murray hardyhead

Key Fish Habitat
- Modelled threatened species distribution
- Key Fish Habitat - Area

Potential habitat for threatened species
- Flathead galaxias
- Silver perch
- Murray crayfish
- Murray hardyhead



Data sources: NSW EPI, DELWP, WSP, EnergyConnect



wsp

VNI West – Revised Aquatic Assessment
Figure 4.2
Mapped threatened species habitat crossed within the VNI Project
Page 2 of 9

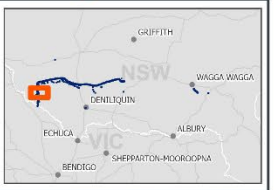
Legend

Strahler stream order within footprint
- 0
- 1
- 2
- 3
- 10
- Watercourse
- Amended project footprint

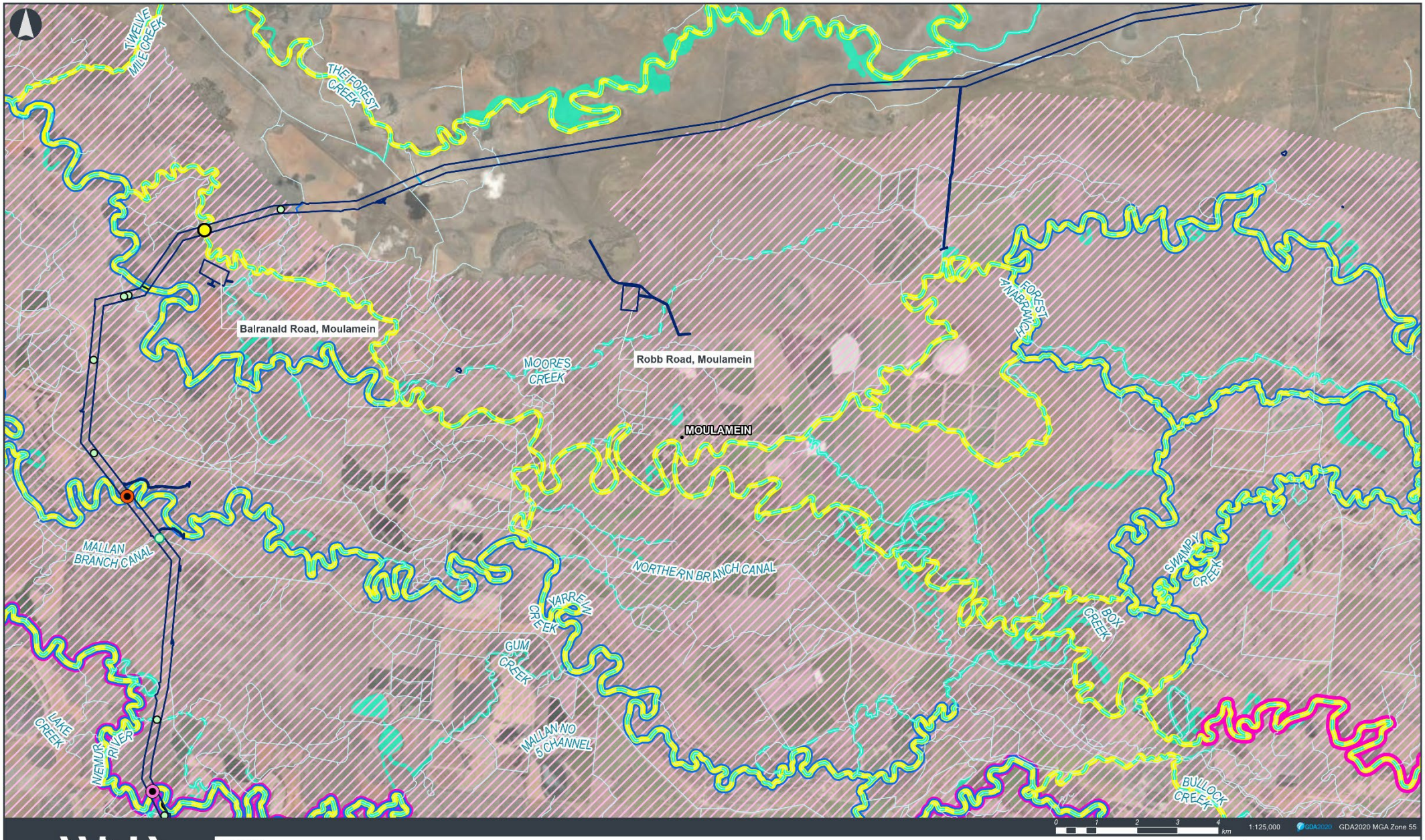
Potential occurrence for threatened fish
- Murray hardyhead
- Silver perch, murray crayfish, flathead galaxias
- Silver perch, murray crayfish, flathead galaxias, murray hardyhead

Key Fish Habitat
- Modelled threatened species distribution
- Key Fish Habitat - Area

Potential habitat for threatened species
- Flathead galaxias
- Silver perch
- Murray crayfish
- Murray hardyhead



Data sources: NSW EPI, DELWP, WSP, EnergyConnect



VNI West – Revised Aquatic Assessment
Figure 4.2
Mapped threatened species habitat crossed within the VNI Project
Page 3 of 9

Legend

Strahler stream order within footprint
- 0
- 1
- 2
- 3
- 10
- Watercourse
- Amended project footprint

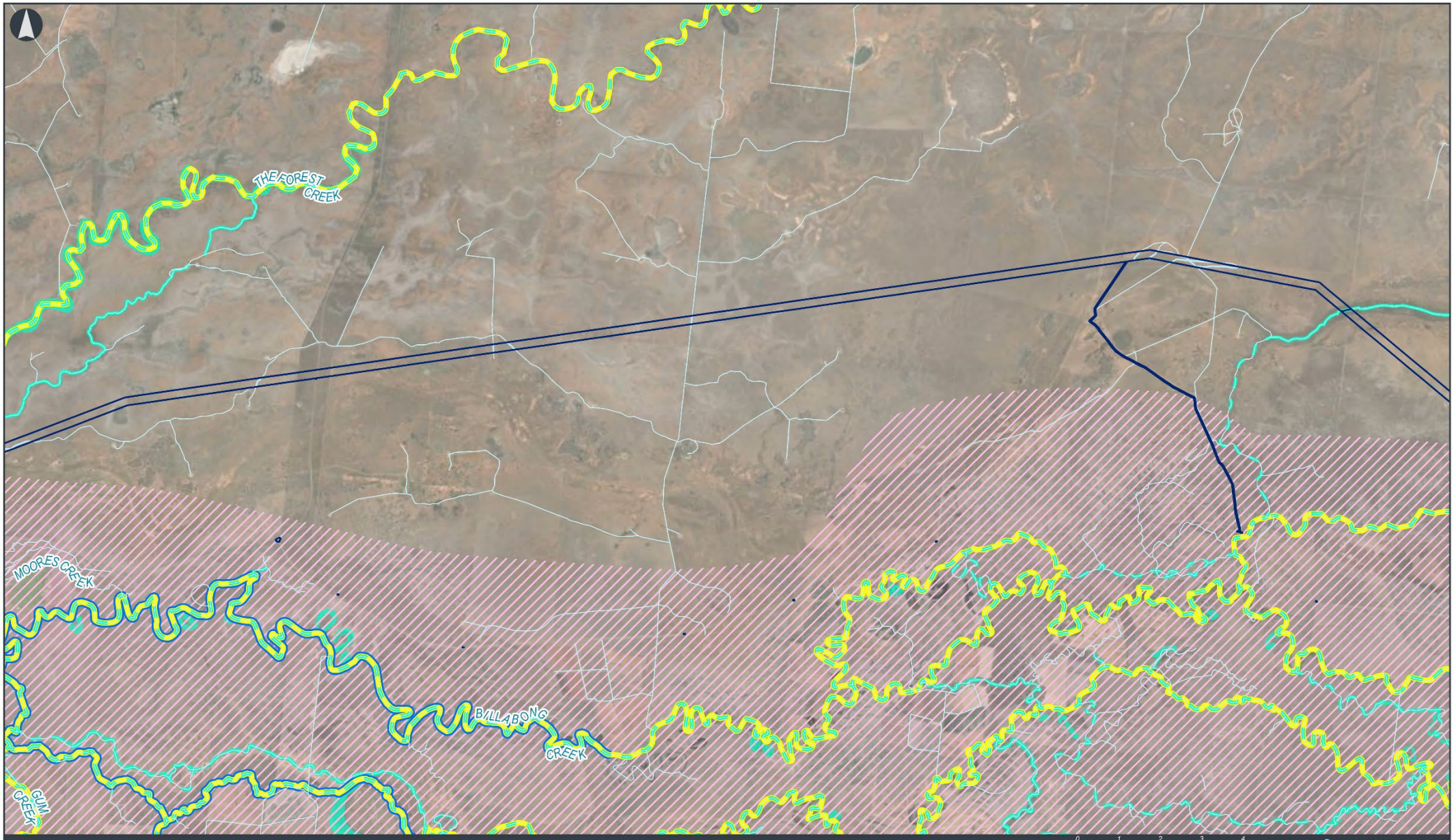
Potential occurrence for threatened fish
- Murray hardyhead
- Murray hardyhead, flathead galaxias
- Silver perch, flathead galaxias, murray hardyhead
- Silver perch, murray crayfish, flathead galaxias, murray hardyhead
- Silver perch, murray hardyhead

Key Fish Habitat
- Modelled threatened species distribution
- Key Fish Habitat - Line
- Key Fish Habitat - Area

Potential habitat for threatened species
- Flathead galaxias
- Silver perch
- Murray crayfish
- Murray hardyhead



Data sources: NSW EPI, DELWP, WSP, EnergyConnect



VNI West – Revised Aquatic Assessment
Figure 4.2
Mapped threatened species habitat crossed within the VNI Project

Legend

Strahler stream order within footprint
- 0
- 1
- 9

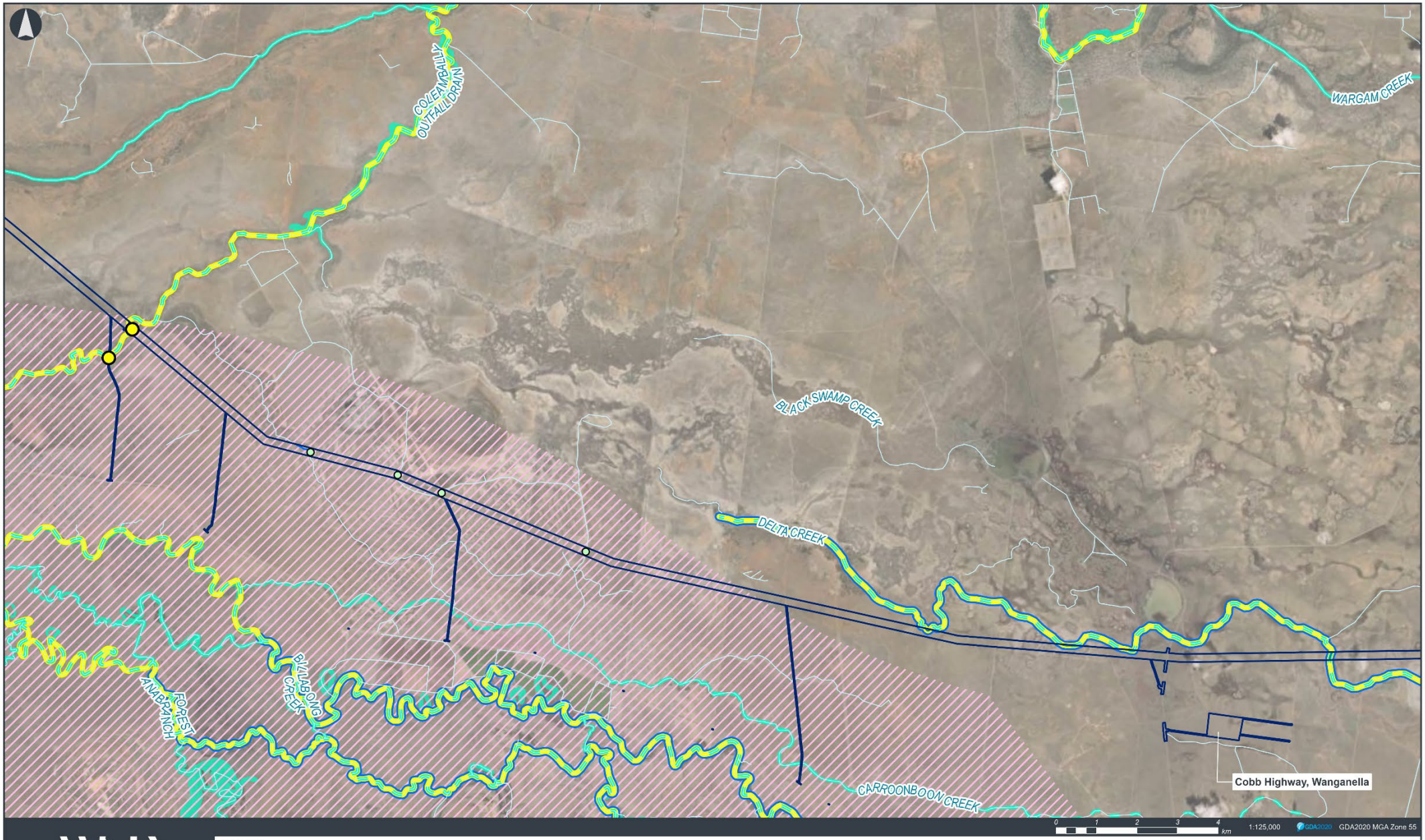
- Watercourse
- Amended project footprint

Key Fish Habitat
- Modelled threatened species distribution
- Key Fish Habitat - Line
- Key Fish Habitat - Area

Potential habitat for threatened species
- Flathead galaxias
- Silver perch
- Murray hardyhead



Data sources: NSW EPI, DELWP, WSP, EnergyConnect



VNI West – Revised Aquatic Assessment
Figure 4.2
Mapped threatened species habitat crossed within the VNI Project
Page 5 of 9

Legend

Strahler stream order within footprint
- 0
- 1
- 2
- 3
- 9
- Watercourse
- Amended project footprint

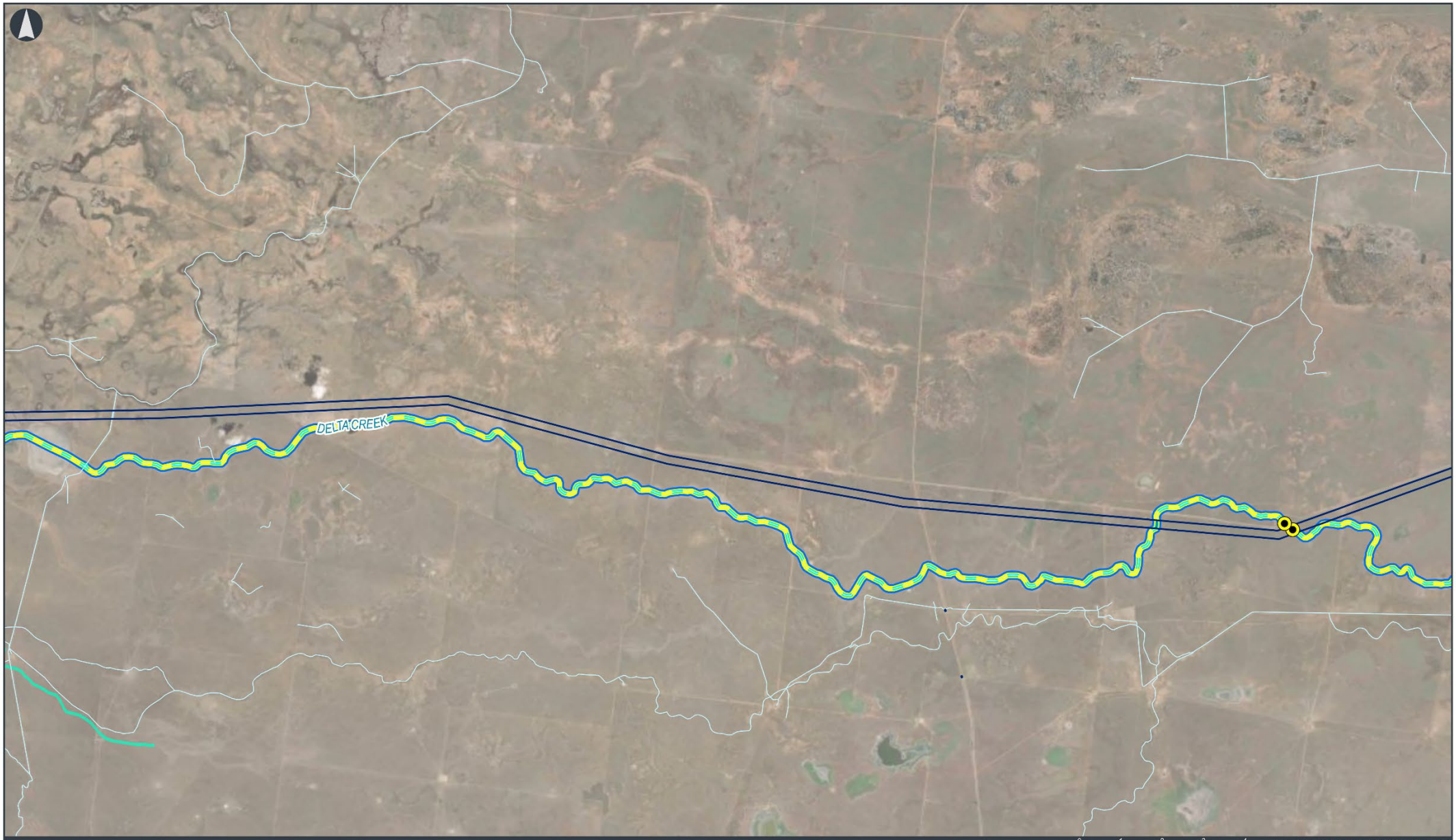
Potential occurrence for threatened fish
- Murray hardyhead
- Silver perch, murray hardyhead

Key Fish Habitat
- Modelled threatened species distribution
- Key Fish Habitat - Line
- Key Fish Habitat - Area

Potential habitat for threatened species
- Flathead galaxias
- Silver perch
- Murray hardyhead



Data sources: NSW EPI, DELWP, WSP, EnergyConnect



VNI West – Revised Aquatic Assessment
Figure 4.2
Mapped threatened species habitat crossed within the VNI Project

Legend

Strahler stream order within footprint
- 0
- 3

- Watercourse
- Amended project footprint

Potential occurrence for threatened fish
- Silver perch, flathead galaxias

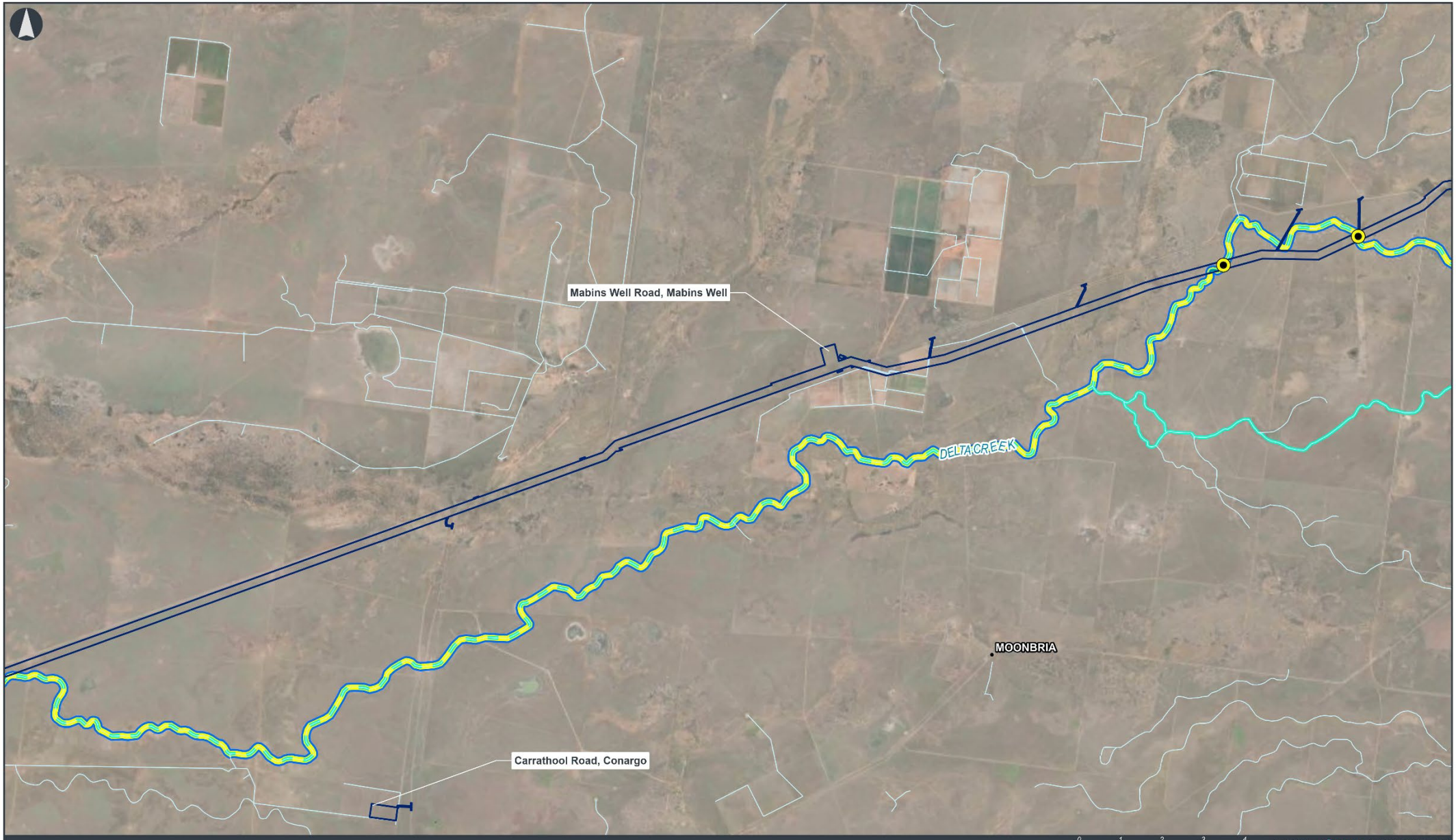
Key Fish Habitat
- Modelled threatened species distribution
- Key Fish Habitat - Line
- Key Fish Habitat - Area

Potential habitat for threatened species
- Flathead galaxias
- Silver perch



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Data sources: NSW EPI, DELWP, WSP, EnergyConnect



wsp

VNI West – Revised Aquatic Assessment
Figure 4.2
Mapped threatened species habitat crossed within the VNI Project

Legend

Strahler stream order within footprint
- 0
- 3

Watercourse
Amended project footprint

Potential occurrence for threatened fish
- Silver perch, flathead galaxias

Key Fish Habitat
- Modelled threatened species distribution
- Key Fish Habitat - Line

Potential habitat for threatened species
- Flathead galaxias
- Silver perch



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Data sources: NSW EPI, DELWP, WSP, EnergyConnect



VNI West – Revised Aquatic Assessment
Figure 4.2
Mapped threatened species habitat crossed within the VNI Project

Legend

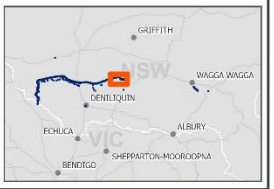
Strahler stream order within footprint
- 1
- 2
- 3

Watercourse
Amended project footprint

Potential occurrence for threatened fish
- Silver perch, flathead galaxias

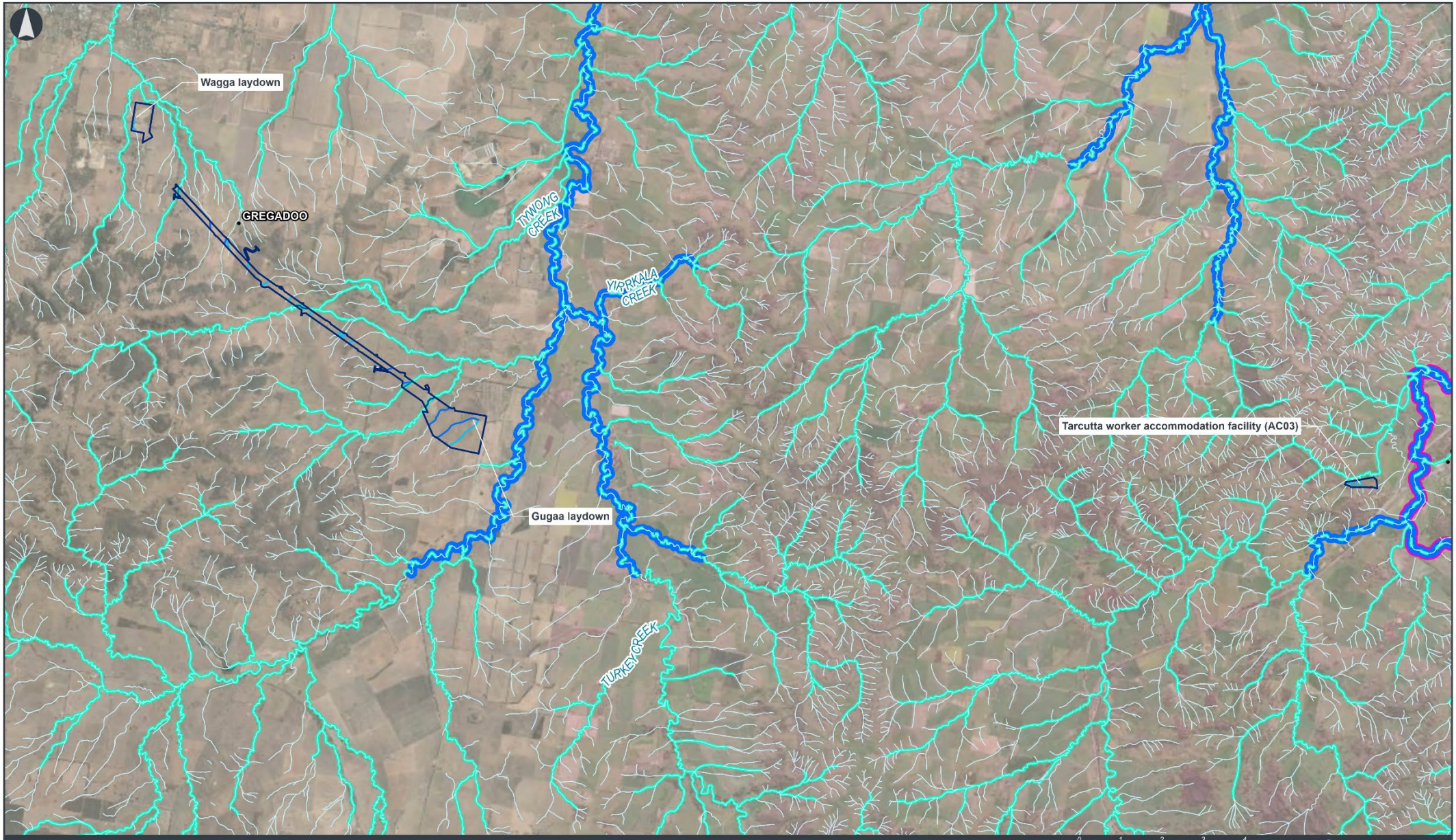
Key Fish Habitat
- Modelled threatened species distribution
- Key Fish Habitat - Line
- Key Fish Habitat - Area

Potential habitat for threatened species
- Flathead galaxias
- Silver perch



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Data sources: NSW EPI, DELWP, WSP, EnergyConnect



VNI West – Revised Aquatic Assessment
Figure 4.2
Mapped threatened species habitat crossed within the VNI Project

Legend

Strahler stream order within footprint
- 1
- 2
- 3
- 4

- Watercourse
- Amended project footprint

Key Fish Habitat
- Modelled threatened species distribution
- Key Fish Habitat - Line

Potential habitat for threatened species
- Flathead galaxias
- Murray crayfish



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Data sources: NSW EPI, DELWP, WSP, EnergyConnect

4.2.4 Threatened aquatic species and communities

4.2.4.1 Endangered ecological communities

There are four endangered ecological communities (EECs) listed in Schedule 4 Part 3 of the FM Act which include:

- aquatic ecological community in the natural drainage system of the lower Murray River catchment
- aquatic ecological community in the natural drainage system of the lowland catchment of the Darling River
- aquatic ecological community in the natural drainage system of the lowland catchment of the Lachlan River
- aquatic ecological community in the catchment of the Snowy River in NSW.

Of these EECs, only one overlaps with the amended study area, which is the aquatic ecological community in the natural drainage system of the lower Murray River catchment (Lower Murray River Catchment EEC).

The Lower Murray River Catchment EEC spans a large area and includes all native fish and aquatic invertebrates within all natural creeks, rivers and associated lagoons, billabongs and lakes of the regulated portions of the Murray, Murrumbidgee and Tumut rivers, as well as all their tributaries and branches (Fisheries Scientific Commitee, N.D).

A list of watercourses containing the EEC includes:

- Murray River downstream of Hume Weir
- Murrumbidgee River downstream of Burrinjuck Dam
- Tumut River downstream of Blowering Dam and all their tributaries' anabranches and effluents including Billabong Creek, Yanco Creek, Colombo Creek, and their tributaries
- Edward River and the Wakool River and their tributaries, anabranches and effluents
- Frenchmans Creek
- Rufus River and Lake Victoria.

4.2.4.2 Threatened species

A database search of the amended study area was conducted in April 2026 using the EPBC Act (Cth) protective matters search tool (Department of Climate Change, Energy, the Environment and Water, 2026), NSW Bionet (NSW Government, 2026b) and the Fisheries Spatial Data Portal (Department of Primary Industries , 2026).

The search identified that a total of eight threatened fish species and one listed crustacean listed under the EPBC Act (Cth) may occur in the amended study area. One species (Flathead Galaxias) is listed as critically endangered, five species (Silver Perch, Murray Hardyhead, Trout Cod, Southern Purple Spotted Gudgeon and Macquarie Perch) are listed as endangered, and three species (Murray Cod, Murray Spiny Crayfish and Southern Pygmy Perch) are listed as vulnerable under the EPBC Act (Cth).

Seven species are also listed under the FM Act (NSW) with two (Flathead Galaxias and Murray Hardyhead) being critically endangered, three (Southern Purple Spotted Gudgeon, Southern Pygmy Perch and Macquarie Perch) being endangered and one (Silver Perch and Murray Spiny Crayfish) being vulnerable.

A likelihood of occurrence assessment for the listed threatened species is presented in Table 4.5.

Table 4.5 Threatened aquatic species identified within 10 kilometres of the amended project footprint

Scientific name	Common name	EPBC Act (Cth)	FM Act (NSW)	Habitat description	Likelihood of occurrence
Bidyanus bidyanus	Silver Perch	E	V	This species exists primarily within the northern and southern extent of the Murray-Darling Basin, with smaller populations scattered in between. Silver Perch inhabit free-flowing riverine environments containing clear water. Silver Perch display no preference for instream microhabitats (i.e. woody debris, instream rocks, riparian vegetation types) and can be found in reaches that contain limited instream habitat features (Department of Climate Change, Energy, the Environment and Water, 2024a).	High – previously recorded near the amended project footprint (Atlas of Living Australia, 2025).
Craterocephalus fluviatilis	Murray Hardyhead	E	CE	This species is endemic to the mid and lower Murray-Darling River system in south-eastern Australia. They are commonly found in open water habitats, particularly in highly saline wetlands, floodplains and lakes (Fishes of Australia , 2025). During the dry season Murray Hardyhead are confined to isolated waterbodies and floodplains. For their reproductive success, Murray Hardyhead depend on eel grass, which they deposit their eggs when they spawn (Fishes of Australia , 2025).	Moderate – the amended project footprint intersects with key fish habitat for this species; however, the known populations of this species do not occur in NSW.
Euastacus armatus	Murray Spiny Crayfish	V	V	This species has a large range which includes Murray and Murrumbidgee Rivers as well as many of their tributaries. Murray Spiny Crayfish habitat includes cool, fast-flowing water containing deep pools, boulder-rich streambeds, and areas with extensive riparian vegetation (Atlas of Living Australia, 2025).	Moderate – the amended project footprint intersects with key fish habitat for this species.
Galaxias rostratus	Flathead Galaxias	CE	CE	This species exists in the southern half of the Murray-Darling Basin system in various habitats such as billabongs, lakes, swamps and rivers, with a preference for still or slow flowing waters (Threatened Species Scientific Committe, 2016). Flathead Galaxias prefer habitats containing coarse sand or mud substrate and aquatic vegetation (NSW Department of Primary Industries, 2014).	Moderate – the amended project footprint overlaps with key fish habitat for this species, however, there have been no records since 1995.

Scientific name	Common name	EPBC Act (Cth)	FM Act (NSW)	Habitat description	Likelihood of occurrence
Maccullochella macquariensis	Trout Cod	E	E	Only one known "natural" breeding population of Trout Cod is known to occur within NSW, which is downstream of the Yarrawonga Weir between Yarrawonga and Barmah (Trout Cod Recovery Team, 2008). This species is known to inhabit deeper rivers that contain a high surface velocity which contain large quantities of woody debris (Trout Cod Recovery Team, 2008).	Moderate – potential for stocked fish to inhabit the larger watercourses within the amended project footprint.
Maccullochella peelii	Murray Cod	V	–	Murray Cod inhabit all major catchments within the Murray-Darling Basin that contain warmer waters. Murray Cod prefer habitats that contain large rocks, woody debris and undercut banks with overhanging vegetation (Fishes of Australia, 2025).	High –previously recorded near the amended project footprint (Atlas of Living Australia, 2025).
Macquaria australasica	Macquarie Perch	E	E	This species is primarily located within the upstream reaches of the Murray-Darling Basin including Lachlan, Murrumbidgee and Murray rivers, and parts of south-eastern coastal NSW. Macquarie Perch prefer habitats with copious cover including aquatic vegetation, woody debris, boulders and overhanging banks (NSW Department of Primary Industries and Regional Development, 2025).	Low – outside known range.
Mogurnda adspersa (Murray-Darling Basin population)	Southern Purple Spotted Gudgeon (Murray-Darling Basin population)	E	E	The southern purple spotted gudgeon occurs in the Murray-Darling basin as well as parts of coastal northern NSW and Queensland. The species can be found in a variety of habitats such as rivers, creeks, watercourse and billabongs with slow-flowing or still waters. Cover in the form of aquatic vegetation, overhanging vegetation from riverbanks, leaf litter, rocks or snags are important for the species. (Department of Climate Change, Energy, the Environment and Water, 2026)	Low – no known records within 10 km of the amended footprint (Atlas of Living Australia, 2026).
Nannoperca australis (Murray-Darling Basin lineage)	Southern Pygmy Perch (Murray-Darling Basin lineage)	V	E	Southern Pygmy Perch prefer habitats in low-gradient waterways and floodplains. It is found in watercourses with slow flowing or still water and aquatic macrophyte cover or wood at shallow depths, which may have little or no flow in summer. This species can tolerate high temperatures and low dissolved oxygen, but lacks salinity tolerance (Threatened Species Scientific Committee, 2021).	Low – no known records within 10 km of the amended footprint (Atlas of Living Australia, 2026).

V = Vulnerable, E = Endangered, CE = Critically Endangered

4.3 Field survey and assessment

As detailed in section 3.5.1, 48 watercourse crossings were identified for further assessment and survey. However, due to property access issues, only 25 of the 48 watercourse crossing locations were assessed via site visit or extrapolation from nearby sites (refer to section 4.3.1). The remaining 23 were assessed via desktop assessment. Figure 4.3 provides the locations of the 48 watercourse crossings identified for further assessment and survey.

In addition to the survey and assessment of watercourse crossing locations, Dillons Swamp was also subject to field assessment during surveys undertaken in September and October 2025. During the aquatic assessment undertaken as part of the EIS, Dillons Swamp was flagged as having the potential to contain habitat conducive for breeding and juvenile rearing. However, based on the field assessment, this did not appear to be the case. Dillons Swamp appeared to have a slight depression with no defined banks and minimal riparian vegetation (no aquatic vegetation) and was dry at the time of assessment. It is likely that Dillons Swamp holds water during rainfall and flooding events but remains dry for most of the year.



Facing west Facing north Facing south

Photo 4.1 Photographs of Dillions swamp taken September 2025

Although Dillons Swamp is mapped to have indicative distribution of FM Act (NSW) and EPBC Act (Cth) listed Flathead Galaxias and Silver Perch, it is unlikely to be used by these species a key habitat due to Dillons Swamp's lack of flow permanency and habitat features (aquatic vegetation, woody debris). It is also important to note that the Flathead Galaxias has not been recorded within this catchment since 1995, providing further evidence that likelihood of this species using Dillons Swamp is low (Threatened Species Scientific Committee, 2016). It is possible that during high flood Silver Perch may migrate to Dillons Swamp but would leave once the flood waters dissipate.

4.3.1 Watercourse crossing surveys

Most of the watercourse crossings surveyed were located within properties that were actively conducting agricultural activities resulting in a range of negative impacts that are known to impact the movement and life cycle success of many aquatic species. These impacts include bank degradation resulting from overgrazing and bank trampling from livestock, exotic species establishment, incorrectly installed and unmaintained crossings, diversion of the natural flow of watercourses and creation of barriers to fish passage.

The surveyed watercourses were deemed to have a varying degree of key fish habitat sensitivity and classification; however, 10 watercourses were not assigned a sensitivity or classification as they did not meet the requirements to be considered key fish habitat (Strahler Order less than three or manmade irrigation channels not connected to key fish habitat) (Department of Primary Industries, 2013). Three watercourses crossings were assessed as containing highly sensitive key fish habitat and 12 minimal sensitive key fish habitats and of these three were assessed as being moderate key fish habitat, four were assessed as being minimal key fish habitat and eight were assessed as being unlikely key fish habitat. The summary of key fish habitat sensitivity and classification is outlined in (Table 4.9).

A total of 13 crossings did not exhibit defined banks, contain native aquatic vegetation or water. It appeared that these mapped watercourses did not regularly flow but instead were located within a floodplain that would periodically flood during high rainfall and flooding events and may provide refuge to migrating aquatic species. Despite these watercourses being mapped as indicative distribution of threatened species, based on the lack of habitat features and connectivity to other fish bearing watercourses it is unlikely that aquatic species, particularly threatened species, would use these mapped watercourses for any purpose other than a migratory pathway between habitats during flooding events.

A total of three crossings would interact with manmade irrigation channels that do not appear to be connected to any fish bearing watercourses or considered key fish habitat (Department of Primary Industries, 2013). Many of these irrigation channels appeared to have native aquatic vegetation, however, the lack of connection of the channel to nearby watercourses inhibits migration of fish into the irrigation channel during a typical year. During a major flood (i.e. one in five years near Billabong Creek as discussed in *Technical paper 9 – Revised hydrology, flooding and water quality* (WSP, 2026b).there is potential that fish could migrate into these channels and become entrapped once the flood waters recede, but it is unlikely entrapped fish would be able to survive and complete their life cycle in any of these irrigation channels.

The remaining nine watercourse crossings exhibited varying degrees of habitat features, water quality and physical features that determined their viability to support aquatic species. All these watercourses are likely to support aquatic species during some portion of the year, whether it be year-round (perennial watercourse) or only during time of rainfall and surplus of water (intermediate watercourses) to act as a refuge area, spawning, breeding or feeding grounds. Many of these watercourses exhibited varying degrees of spawning features such as:

- native aquatic plants:
- high oxygen water (>85 per cent)
- shade/shelter: (all class one, two and three habitats).

Spawning features are unique to each species and their requirements. Note that many species in the Murray–Darling basin are unique as they require flood events to induce spawning, which most assessed watercourses have the potential breach the banks allowing water to flow into the floodplains (King *et al*., 2009). The watercourses along the amended project footprint have historically experienced extreme flooding with one of the most extreme cases peaking at 70.42 metres Australian Height Datum with a flow of 402.2 m^3/s at the Moulamein gauge in 1956 (refer to *Technical paper 9 – Revised hydrology, flooding and water quality* (WSP, 2026b). These flows suggest that all drainages and flood plain areas have the potential to contain aquatics species, displaced by the flooding, however, this does not necessarily mean that these lower order watercourses that lack bank definition and instream habitat are distinct key fish habitat. For more information on historical floods within the amended study area refer to *Technical paper 9 – Revised hydrology, flooding and water quality* (WSP, 2026b).

The description of each watercourse crossing surveyed and extrapolated is outlined in Table 4.6 and Table 4.7, respectively and the details of the habitat assessment are summarised in Appendix C.



wsp

VNI West – Revised Aquatic Assessment
Figure 4.3a
Survey locations overview

Legend

- Road
- Watercourse
- Amended project footprint

Aquatic survey location

- Desktop assessment
- Site Visit

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Data sources: NSW EPI, DELWP, WSP, EnergyConnect



wsp

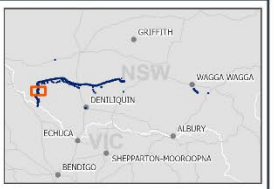
VNI West – Revised Aquatic Assessment
Figure 4.3b
Survey locations overview

Legend

- Road
- Watercourse
- Amended project footprint

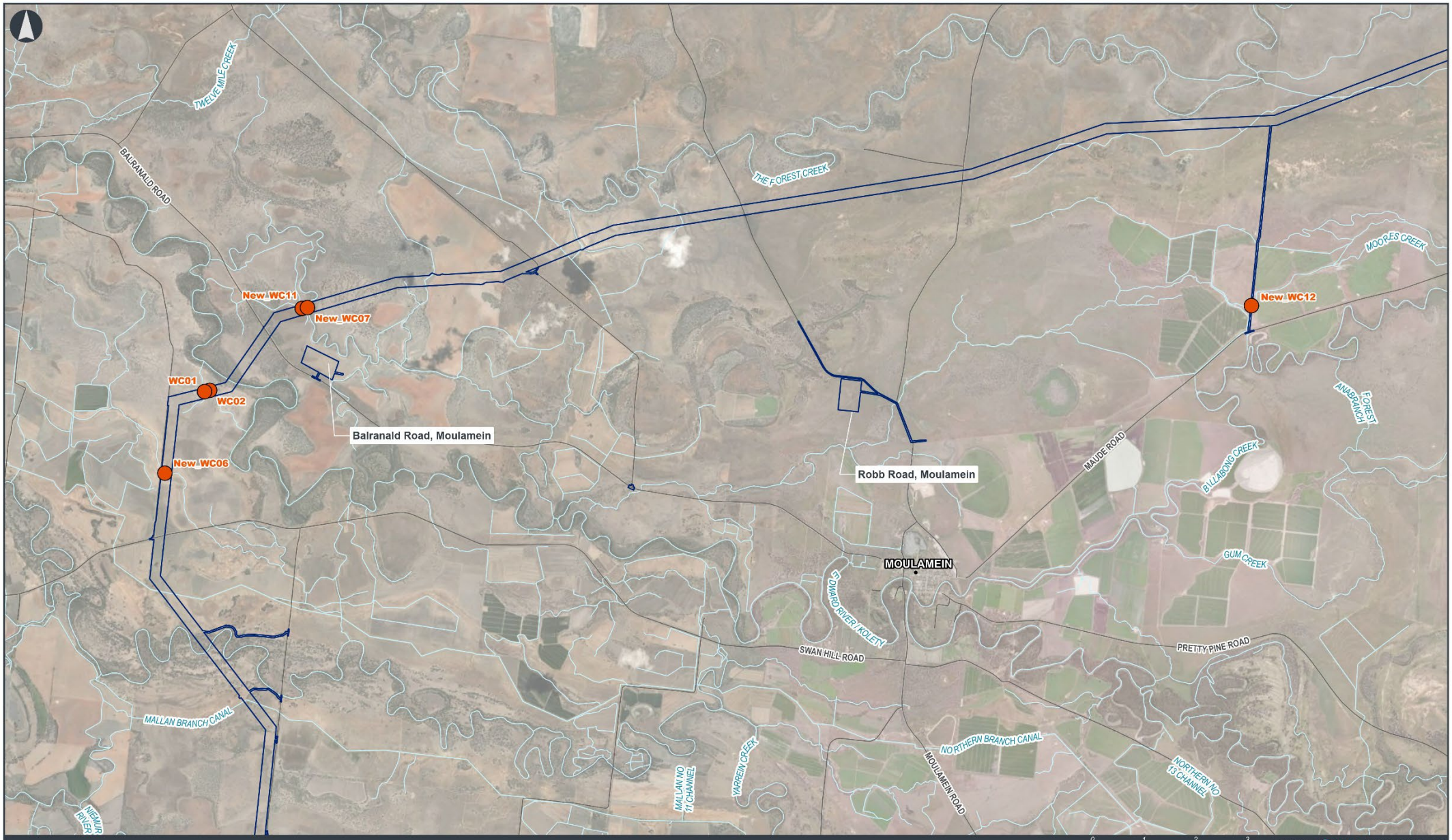
Aquatic survey location

- Desktop assessment
- Extrapolated
- Site Visit



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Data sources: NSW EPI, DELWP, WSP, EnergyConnect



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VNI West – Revised Aquatic Assessment
Figure 4.3c
Survey locations overview

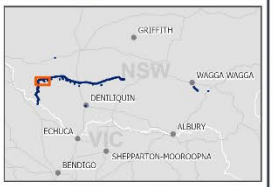
Legend

Road

Amended project footprint

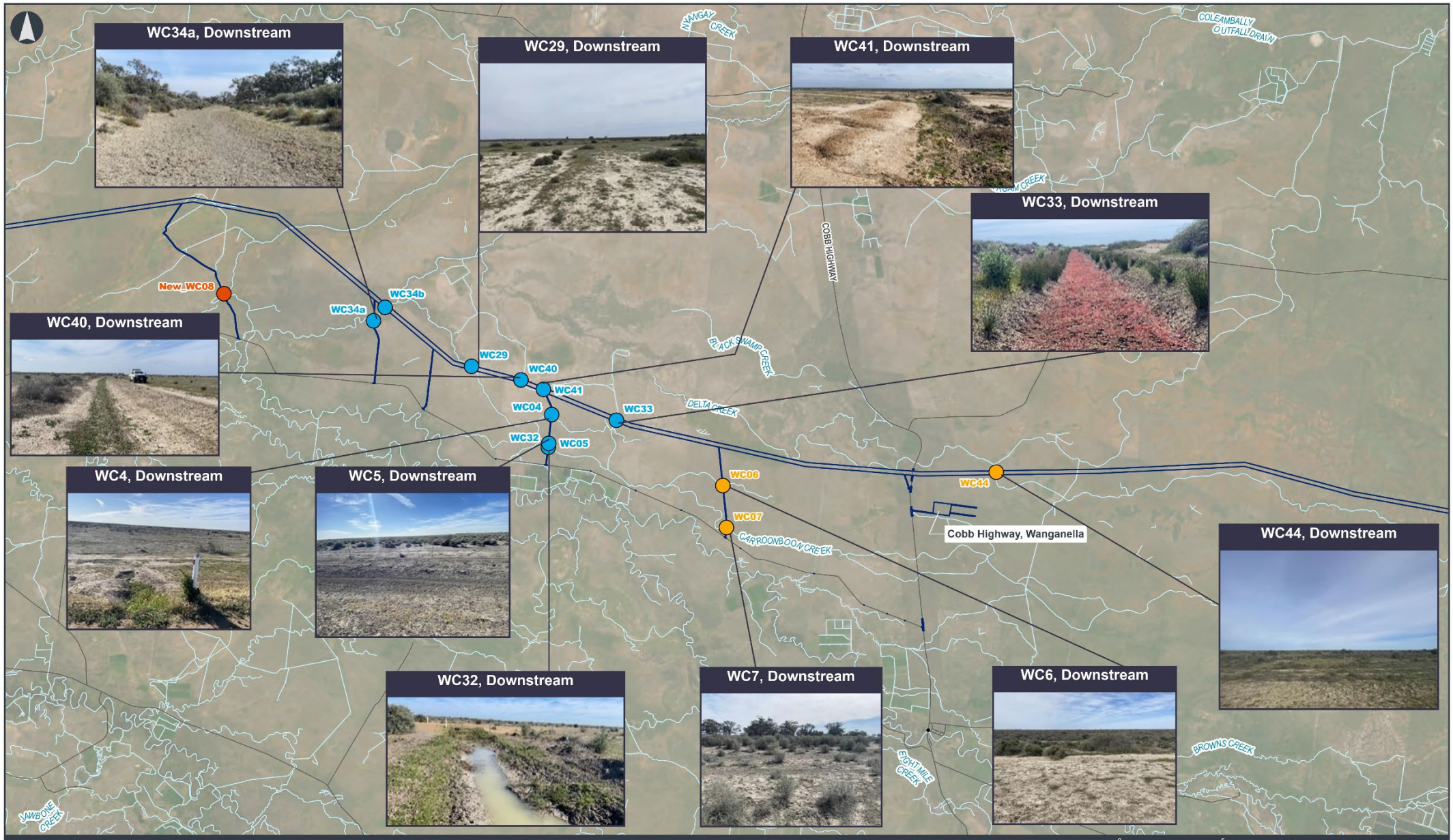
Aquatic survey location

Desktop assessment



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Data sources: NSW EPI, DELWP, WSP, EnergyConnect



wsp

VNI West – Revised Aquatic Assessment
Figure 4.3d
Survey locations overview

Legend

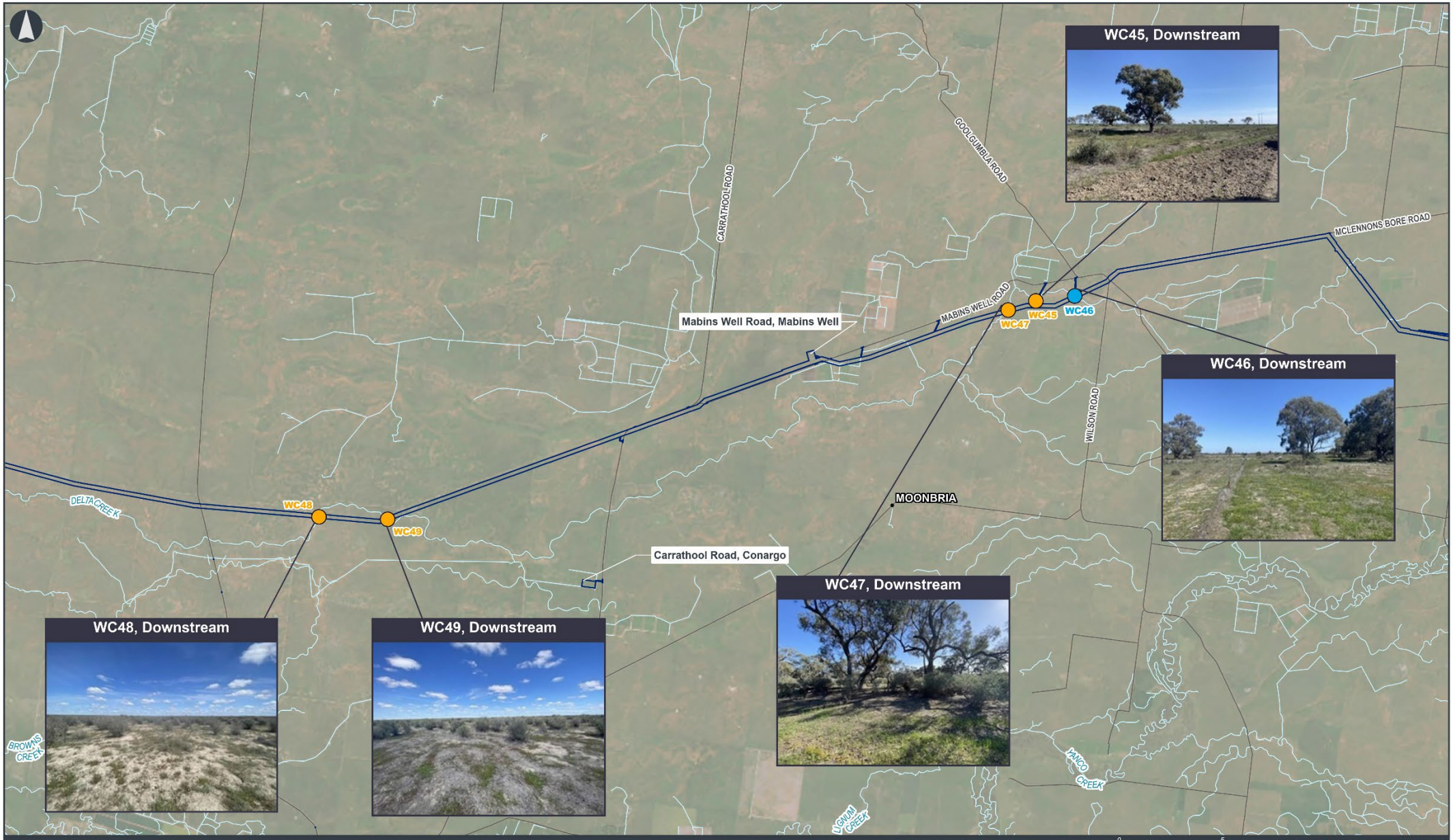
Road
Amended project footprint

Aquatic survey location

Desktop assessment
Extrapolated
Site Visit



Data sources: NSW EPI, DELWP, WSP, EnergyConnect



wsp

VNI West – Revised Aquatic Assessment
Figure 4.3e
Survey locations overview

Legend

- Road
- Amended project footprint

Aquatic survey location

- Extrapolated
- Site Visit

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Data sources: NSW EPI, DELWP, WSP, EnergyConnect



wsp

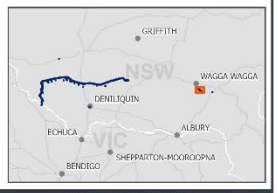
VNI West – Revised Aquatic Assessment
Figure 4.3f
Survey locations overview

Legend

- Road
- Amended project footprint

Aquatic survey location

- Site Visit



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Data sources: NSW EPI, DELWP, WSP, EnergyConnect

Table 4.6 Description of watercourses surveyed

Site ID	Watercourse description	Photographs (central survey location)	
WC36	This unnamed watercourse did not exhibit defined banks nor was water present during the assessment. The watercourse appears to be a drainage leading into a manmade dam. The watercourse is a mixture of riparian and upland species such as Panic Grass (*Panicum* sp.) and Wingless Bluebush (*Maireana enchlanoides*) suggesting saturation is common but not long-term. As this unnamed watercourse has a Strahler order less than three, it is not considered to be key fish habitat as per the. *Policy and guidelines for fish habitat conservation and management (Update 2013)* Although this watercourse is within the indicative habitat of Murray Hardyhead, it is highly unlikely this drainage would be key habitat for this species as there are minimal habitat features that would support this species.	**Downstream**	**Left Bank**
			No defined banks
		Upstream	**Right Bank**
			No defined banks

Site ID	Watercourse description	Photographs (central survey location)	
WC17	This unnamed watercourse contained mapped key fish habitat and would be considered type 3 – minimal key fish habitat as it contains unstable or unvegetated sand or mud substrate and does not support native aquatic vegetation. Where the amended project intersects this unnamed watercourse, the reach would be classed as class 3 – minimal key fish habitat as this watercourse likely exhibits intermittent flow and provides sporadic refuge or feeding areas for aquatic fauna after a rain event and is connected to a downstream class two watercourse. This section of unnamed watercourse has been impacted by agricultural operations and the current access track that has resulted in a fish passage barrier, which fully inhibits fish passage. The riparian vegetation consists of a mixture of exotic and native species, with dominant native species being Black Box (*Eucalyptus largiflorens*) and Curled Dock (*Rumex* sp.). The surveyed bank width of this watercourse ranges from 25.5 to 46.7 metres and heights ranged from 1.1 to 3.0 metres on the left bank and 1.1 to 3.1 metres on the right bank. This watercourse is within a flood plain and water likely breaches its natural banks during extremely high floods.	**Downstream**	**Left Bank**
			
		Upstream	**Right Bank**
			

Site ID	Watercourse description	Photographs (central survey location)	
WC31	Southern No 26 is a man-made irrigation channel and used for agricultural operations. Typically, an irrigation channel is exempt for being classified as key fish habitat, however, through discussions with the landowner it was revealed that Murray Cod, an EPBC Act listed species, is commonly found within the irrigation channel. As such, this irrigation channel has been rated a type 3 – minimal sensitive key fish habitat due to the lack of gravel substrate and native aquatic vegetation present species and classed as class 3 – minimal key fish habitat as the slow-moving waterway has sporadic refuge of both native (Murray Cod) and exotic species (Common Carp). The riparian vegetation consists largely of exotic species such as dominant species Barley (*Hordeum vulgare*) and Clover (*Trifolium* sp). Emergent vegetation consists of Sedges (*Carex* sp.). The surveyed bank width of Southern No 26 is 7.1 metres and the height for both the left and right bank are 0.6 metres tall.	**Downstream** 	**Left Bank** 
		Upstream 	**Right Bank** 

Site ID	Watercourse description	Photographs (central survey location)	
WC34a and WC34b	Coleambally Outfall Drain contained mapped key fish habitat and would be considered type 3 – minimal sensitive key fish habitat as this watercourse does not support native aquatic or wetland vegetation. Where the amended project intersects Coleambally Outfall Drain, the reach would be classed as class 3 – minimal key fish habitat as this watercourse likely exhibits intermittent flow and is connected to a downstream class 1 to 3 watercourse (Billabong Creek). The riparian vegetation consists of a mixture of exotic and native species, with dominant native species being Australian Tumbleweed (*Salsola australis*) and Nitre Bush (*Nitraria billardierei*). The surveyed bank width of Coleambally Outfall Drain ranges from 25.6 to 13.6 metres and heights ranged from 1.1 to 1.4 metres on the left bank and 1.1 to 1.7 metres on the right bank. This section of watercourse has been impacted by agricultural operations via livestock rearing and has deteriorated banks as a result. The watercourse is relatively homogenous and has similar habitat features/ vegetation types both upstream and downstream of the WC34a point that the assessment was completed. It is likely that WC34b would have a similar habitat structure and would maintain the same type and class as 34a. This watercourse is located within a flood plain and water likely breaches its natural banks during the five per cent Annual Exceedance Probability (5% AEP) flood event as discussed in *Technical paper 9 – Revised hydrology, flooding and water quality* (WSP, 2026b).	**Downstream** 	**Left Bank** 
		Upstream 	**Right Bank** 

<table>
<tr><th>Site ID</th><th>Watercourse description</th><th colspan="2">Photographs (central survey location)</th></tr>
<tr><td rowspan="4">WC29</td><td rowspan="4">This unnamed watercourse did not exhibit defined banks nor was water present during the assessment. The low point appeared to be less vegetated and would likely hold water during high rain fall or flooding events. The watercourse contained typically terrestrial dry species that contained a mix of native species such as Leafless Bluebush (Maireana aphylla) and Mallee Saltbush (Atriplex stipitata) and exotic species such as Barley (Hordeum vulgare) and Perennial Ryegrass (Lolium perenne) suggesting saturation is short term.

As this unnamed watercourse has a Strahler order less than three, it is not considered to be key fish habitat as per the. Policy and guidelines for fish habitat conservation and management (Update 2013)

Although this watercourse is within the indicative habitat of Murray Hardyhead, it is highly unlikely this drainage would be key habitat for this species as there are minimal habitat features that would support this species.</td><td>Downstream</td><td>Left Bank</td></tr>
<tr><td>  </td><td>No defined banks</td></tr>
<tr><td>Upsteam</td><td>Right Bank</td></tr>
<tr><td>  </td><td>No defined banks</td></tr>
</table>

Site ID	Watercourse description	Photographs (central survey location)	
WC40	This unnamed watercourse is an irrigation channel that does not appear to be connected to any fish bearing watercourses nor is it considered key fish habitat. The riparian vegetation was sparse but contained some native species including Leafless Bluebush (*Maireana aphylla*) and Common Sunray (*Triptilodiscus pygmaeus*) and exotic species include Barley (*Hordeum vulgare*) and *Medicargo sp*. The surveyed bank width for this watercourse is between 6.0 to 6.1 metres. The height of this unnamed watercourse is between 0.8 and 1.0 metres on the left bank and 0.9 to 1.1 metres on the right bank. As this unnamed watercourse is an irrigation channel that is not connected to fish bearing watercourse, it is not considered to be key fish habitat as per the. *Policy and guidelines for fish habitat conservation and management (Update 2013).* It is unlikely fish would inhabit this irrigation channel except during high flood periods that may result in fish entrapment from nearby watercourses.	**Downstream** 	**Left Bank** 
		Upstream 	**Right Bank** 

Site ID	Watercourse description	Photographs (central survey location)	
WC41	This unnamed watercourse is an irrigation channel that does not appear to be connected to any fish bearing watercourses nor is considered key fish habitat. The riparian vegetation was sparse but contained native species such as Common Everlasting (*Chrysocephalum apiculatum*) and Nitre Bush (*Nitraria billardierei*) and exotic species such as Perennial Ryegrass (*Lolium perenne*) and Barley (*Hordeum vulgare*). The surveyed bank width for this watercourse is 4.5 metres. The height of this unnamed watercourse is uniform being 0.6 metres on the left bank and 0.5 metres on the right bank. As this unnamed watercourse is an irrigation channel that is not connected to fish bearing watercourse, it is not considered to be key fish habitat as per the. *Policy and guidelines for fish habitat conservation and management (Update 2013).* It is unlikely fish would inhabit this irrigation channel except during high flood periods that may result in fish entrapment from nearby watercourses.	**Downstream** 	**Left Bank** 
		Upstream 	**Right Bank** 

<table>
<tr><th>Site ID</th><th>Watercourse description</th><th colspan="2">Photographs (central survey location)</th></tr>
<tr><td rowspan="4">WC04</td><td rowspan="4">This unnamed watercourse did not exhibit defined banks nor was water present during the assessment. There was no apparent low point as this watercourse has likely been modified as a result of agricultural activities. Within the area the vegetation was dominated by exotic species Capeweed (Arctotheca calendula).and Barley (Hordeum vulgare).

As this unnamed watercourse has a Strahler order less than three, it is not considered to be key fish habitat as per the. Policy and guidelines for fish habitat conservation and management (Update 2013).

Although this watercourse is within the indicative habitat of Murray Hardyhead, it is highly unlikely this drainage would be key habitat for this species as there are minimal habitat features that would support this species.</td><td>Downstream</td><td>Left Bank</td></tr>
<tr><td>  </td><td>No defined banks</td></tr>
<tr><td>Upstream</td><td>Right Bank</td></tr>
<tr><td>  </td><td>No defined banks</td></tr>
</table>

Site ID	Watercourse description	Photographs (central survey location)	
WC05	This reach of Carroonboon Creek did not exhibit defined banks nor was water present during the assessment. The mapped watercourse has been replaced by a roadside drainage, which was likely modified as a result of agricultural activities. The roadside drainage does not have a culvert associated with it suggesting it rarely flows. Within the area the vegetation was dominated by exotic species Barley (*Hordeum vulgare*) and upland species Leafless Bluebush (*Maireana aphylla*). As this unnamed watercourse has a Strahler order less than three, it is not considered to be key fish habitat as per the. *Policy and guidelines for fish habitat conservation and management (Update 2013).* Although this watercourse is within the indicative habitat of Murray Hardyhead, it is highly unlikely this reach would be key habitat for this species as there are minimal habitat features that would support this species.	**Downstream**	**Left Bank**
			No defined banks
		Upstream	**Right Bank**
			No defined banks

Site ID	Watercourse description	Photographs (central survey location)	
WC32	This unnamed watercourse contained mapped key fish habitat, despite the watercourse being highly modified, it would be considered type 1 – highly sensitive key fish habitat due to the presence of native aquatic plants including Common Rush (*Juncus usitatus*), Common Nardoo (*Marsilea drummondii*) and Common Spikerush (*Eleocharis acuta*). Where the amended project intersects the watercourse, the reach would be classed as class 2 – moderate key fish habitat as the watercourse exhibits clearly defined bed and banks with semi-permanent to permanent waters in pools with aquatic vegetation. This section of the watercourse has been impacted by agricultural operations, particularly for livestock rearing. The riparian vegetation consists of a mixture of exotic and native species, with dominant native species being aquatic species such as Common Rush (*Juncus usitatus*) and Common Spike rush (*Eleocharis acuta*). The surveyed bank width of the watercourse ranged from 3.9 to 5.1 metres and heights ranged from 0.5 to 0.6 metres on the left bank and 0.5 to 0.7 metres on the right bank. This unnamed watercourse has been modified into an irrigation channel but is still mapped as key fish habitat and appears to be connected to Billabong Creek. It is likely fish would use this watercourse as a refuge, during high floods or droughts, as this watercourse is likely wetted for more of the year.	**Downstream**	**Left Bank**
			
		Upstream	**Right Bank**
			

Site ID	Watercourse description	Photographs (central survey location)	
WC33	This unnamed watercourse is a manmade irrigation channel that is not connected to any fish bearing watercourses, therefore the watercourse is not considered to be key fish habitat despite containing native aquatic plants. The surveyed bank width of the watercourse ranges from 5.7 to 6.1 metres and heights ranged from 1.0 to 1.1 metres on the left bank and 0.5 to 1.8 metres on the right bank. As this unnamed watercourse is an irrigation channel that is not connected to fish bearing watercourse, it is not considered to be key fish habitat as per the. *Policy and guidelines for fish habitat conservation and management (Update 2013).* It is unlikely fish would inhabit this irrigation channel except during high flood periods that may result in fish entrapment from nearby watercourses.	**Downstream** 	**Left Bank** 
		Upstream 	**Right Bank** 

<table>
<tr><th>Site ID</th><th>Watercourse description</th><th colspan="2">Photographs (central survey location)</th></tr>
<tr><td rowspan="4">WC46</td><td rowspan="4">Delta Creek is mapped as being key fish habitat and would be considered type 3 – minimal sensitivity key fish habitat and this watercourse contains aquatic habitat that does not support native aquatic or wetland vegetation. Where the amended project intersects the watercourse, the reach would be classed as class 4 – unlikely fish habitat as this watercourse exhibits little or no defined drainage channel. This reach of Delta Creek did not exhibit defined banks nor was water present during the assessment. The watercourse contained a mix of mostly riparian (Nitre Bush (Nitraria billardierei), Tangled Lignum (Duma floribunda) and Black-Box (Eucalyptus largiflorens)), some upland (Spread-fruit Copperburr (Sclerolaena patenticuspis) and Panicum sp.)) and exotic ((Lolium perenne), Barley (Hordeum vulgare) and African Boxthorn (Lycium ferocissium)) suggesting this reach can be waterlogged. Based on historical data Delta Creek would experience flooding during the 5% AEP flood events discussed in Technical paper 9 – Revised hydrology, flooding and water quality (WSP, 2026b). During high floods there is potential that ‘woody debris’ and the vegetation within this reach of Delta Creek could act as habitat for Flathead Galaxias and Silver Perch, albeit this is unlikely key fish habitat, instead act a migratory corridor during high floods.

A dam next to the survey point contains Common Carp, which has been stocked by the landowner. During high flows and flooding, this invasive species has the potential to migrate out of the dam into surrounding watercourses.</td><td>Downstream</td><td>Left Bank</td></tr>
<tr><td>  </td><td>No defined banks</td></tr>
<tr><td>Upstream</td><td>Right Bank</td></tr>
<tr><td>  </td><td>No defined banks</td></tr>
</table>

<table>
<tr><th>Site ID</th><th>Watercourse description</th><th colspan="2">Photographs (central survey location)</th></tr>
<tr><td rowspan="4">WC53</td><td rowspan="4">This unnamed watercourse is mapped as key fish habitat (as it has a Strahler Order >3), however the area is highly modified upstream and at the crossing location contains no banks, native aquatic vegetation or riparian vegetation. Approximately 20 metres downstream of the potential crossing the watercourse becomes more defined. This location is likely the beginning of the watercourse that contains key fish habitat downstream. As this is the headwater to this unnamed watercourse mapped as key fish habitat, any impacts to water quality or changes/blockage in drainage flow, would have lasting impacts to the downstream environment, that contains more defined aquatic habitat features.

It is unlikely fish would inhabit this reach of the watercourse except during high flood periods.</td><td>Downstream</td><td>Left Bank</td></tr>
<tr><td>  </td><td>No defined banks</td></tr>
<tr><td>Upstream</td><td>Right Bank</td></tr>
<tr><td>  </td><td>No defined banks</td></tr>
</table>

Site ID	Watercourse description	Photographs (central survey location)	
WC54	The unnamed watercourse contains mapped key fish habitat and is considered to be type 1 – highly sensitive key fish habitat due to the presence of native flora species including Common Duckweed (*Lemna disperma*) and Common Rush (*Juncus usitatus*) and the presence of large woody debris (snags) within the channel. Where the amended project intersects with unnamed watercourse, the reach is likely classed as class 2 – moderate key fish habitat as it is an intermittent flowing watercourse with type one habitat present. The riparian vegetation consists of a mixture of both exotic and native species; dominant native species include Red Gum (*Eucalyptus camaldulensis*) and Sedges (*Carex* sp*)*. Dominant exotic species include Wild Oat (*Avena barbata*) and *Arctotheca* sp. The surveyed width of unnamed watercourse is between 2.5 metres and eight metres and with a bank height between 0.6 metres and 2.0 metres on the left and right bank. The unnamed watercourse currently contains a crossing structure that impedes fish passage to the upstream wetland habitat. The crossing structure is a pinched / destroyed culvert and it is currently unusable as a result of its degradation If an appropriate culvert was erected, it would open up fish passage to the upstream wetland, which would act a great refuge for fish. There are habitat features within this watercourse that are considered to be high quality habitat features and based on downstream connectivity it is likely fish would inhabit this reach of watercourse.	**Downstream** 	**Left Bank** 
		Upstream 	**Right Bank** 

Table 4.7 Description of watercourses surveyed but were outside amended project footprint but data is extrapolated

<table>
<tr><th>Site ID</th><th>Watercourse description</th><th colspan="2">Photographs</th></tr>
<tr><td rowspan="4">WC06</td><td rowspan="4">This unnamed watercourse did not exhibit defined banks nor was water present during the assessment. The low point appeared to be less vegetated and would likely hold water during high rain fall or flooding events. The watercourse contained typically terrestrial dry species such as Leafless Bluebush (Maireana aphylla) and exotic Medicargo sp. suggesting saturation is short term and likely only occurs during flooding events. Although this watercourse is within the indicative habitat of Murray Hardyhead, it is highly unlikely this drainage would be key habitat for this species as there are minimal habitat features that would support this species.

As this unnamed watercourse has a Strahler order less than three, it is not considered to be key fish habitat as per the. Policy and guidelines for fish habitat conservation and management (Update 2013).

Although this survey point is not on the exact crossing location, this watercourse did not exhibit large variation in habitat feature vegetation type. As such it can be concluded that the assessment of this section of this unnamed watercourse would be the same as the amended project crossing location.</td><td>Downstream</td><td>Left Bank</td></tr>
<tr><td>  </td><td>No defined banks</td></tr>
<tr><td>Upstream</td><td>Right Bank</td></tr>
<tr><td>  </td><td>No defined banks</td></tr>
</table>

<table>
<tr><th>Site ID</th><th>Watercourse description</th><th colspan="2">Photographs</th></tr>
<tr><td rowspan="4">WC07</td><td rowspan="4">Carroonboon Creek is mapped as being key fish habitat and is considered to be type 3 – minimal sensitivity key fish habitat and this watercourse contains aquatic habitat that does not support native aquatic or wetland vegetation. Where the amended project intersects the watercourse, the reach would be classed as class 4 – unlikely fish habitat as this watercourse exhibits little or no defined drainage channel. This reach of Carroonboon Creek did not exhibit defined banks nor was water present during the assessment. This reach appeared to have a depression with flora species that are typically tolerant to saturated soil including Nitre Bush (Nitraria billardierei) and Tangled Lignum (Duma floribunda) and just upstream of the survey location was a stand of flood plain species, Black-Box (Eucalyptus largiflorens) suggesting this reach can be waterlogged. Although this watercourse is within the indicative habitat of Murray Hardyhead, this reach is unlikely to be key habitat for this species as there are minimal habitat features that would support this species, however, this watercourse has potential to be used as a migration pathway during high floods.

Although this survey point is not on the exact crossing location, Carroonboon Creek did not exhibit large variation in habitat feature vegetation type. As such it can be concluded that the assessment of this section of this Carroonboon Creek would be the same as the amended project crossing location.</td><td>Downstream</td><td>Left Bank</td></tr>
<tr><td>  </td><td>No defined banks</td></tr>
<tr><td>Upstream</td><td>Right Bank</td></tr>
<tr><td>  </td><td>No defined banks</td></tr>
</table>

Site ID	Watercourse description	Photographs	
WC18	This crossing at Jaffrey Creek contains mapped key fish habitat and would be considered type 1 – highly sensitive key fish habitat due to the presence of native aquatic plants including Common Rush (*Juncus usitatus*), and Lesser Joyweed (*Alternanthera denticulata),* and presence of large instream woody debris (snags). Where the amended project intersects the watercourse, the reach would be classed as class 2 – major key fish habitat as this watercourse is non-permanently flowing watercourse with clearly defined bed and banks with semi-permanent that contains freshwater aquatic vegetation. The riparian vegetation consists of a mixture of exotic and native species, with dominant native species being Black-box (*Eucalyptus largiflorens)* and Common Rush (*Juncus usitatus*). The surveyed bank width of this watercourse ranges from 25.5 to 35.4 metres and heights range from 1.2 to 3.2 metres on the left bank and 1.0 to 3.1 metres on the right bank. This watercourse is within a flood plain and water likely breaches its natural banks during extremely high floods. Based on the habitat features of Jaffery Creek is likely that fish would inhabit this reach, particularly during high flow events. Although this survey point is not on the exact crossing location, Jaffery Creek did not exhibit large variation in habitat feature including instream, and riparian vegetation, habitat structure and bank width. As such it can be concluded that the type and class of this section of Jaffery Creek would be the same as the amended project crossing location.	**Downstream** 	**Left Bank** 
		Upstream 	**Right Bank** 

<table>
<tr><th>Site ID</th><th>Watercourse description</th><th colspan="2">Photographs</th></tr>
<tr><td rowspan="4">WC21a and 21b</td><td rowspan="4">This unnamed watercourse did not exhibit defined banks nor was water present during the assessment. The low point (depression) appeared to be less vegetated and would likely hold water during high rainfall or flooding events.
The watercourse contained typically terrestrial dry species such as Cotton Bush (Maireana aphylla) and Old Man Saltbush (Atriplex numilaria) suggesting saturation is short term. Although this watercourse is within the indicative habitat of Murray Hardyhead, it is highly unlikely this drainage would be key habitat for this species as there are minimal habitat features that would support this species.

As this unnamed watercourse has a Strahler order less than three, it is not considered to be key fish habitat as per the. Policy and guidelines for fish habitat conservation and management (Update 2013).

The photographs for this assessment were taken at WC21a, however, the watercourse has homogenous features that extend to WC21b.</td><td>Downstream</td><td>Left Bank</td></tr>
<tr><td>  </td><td>No defined banks</td></tr>
<tr><td>Upstream</td><td>Right Bank</td></tr>
<tr><td>  </td><td>No defined banks</td></tr>
</table>

<table>
<tr><th>Site ID</th><th>Watercourse description</th><th colspan="2">Photographs</th></tr>
<tr><td rowspan="4">WC44</td><td rowspan="4">Delta Creek is mapped as being key fish habitat and would be considered type 3 – minimal sensitivity key fish habitat and this watercourse contains aquatic habitat that does not support native aquatic or wetland vegetation. Where the amended project intersects the watercourse, the reach would be classed as class 4 – unlikely fish habitat as this watercourse exhibits little or no defined drainage channel. This reach of Delta Creek did not exhibit defined banks nor was water present during the assessment. The low point appeared to be less vegetated and would likely hold water during high rain fall or flooding events. The watercourse contained typically terrestrial dry species such as Australian Tumbleweed (Salsola australis) and Creeping Saltbush (Atriplex semibaccata) and the main exotic species being primarily Barley (Hordeum vulgare) suggesting saturation is short term and likely only occurs during flooding events. Based on historical data Delta Creek would experience flooding during the 5% AEP flood events as discussed in Technical paper 9 – Revised hydrology, flooding and water quality (WSP, 2026b).).

Although this watercourse is within the indicative habitat of Flathead Galaxias and Silver Perch, it is highly unlikely this drainage would be key habitat for this species as there are minimal habitat features that would support this species.

Although this survey point is not on the exact crossing location, Delta Creek did not exhibit large variation in habitat feature vegetation type. As such it can be concluded that the assessment of this section of this Delta Creek would be the same as the amended project crossing location.</td><td>Downstream</td><td>Left Bank</td></tr>
<tr><td>  </td><td>No defined banks</td></tr>
<tr><td>Upstream</td><td>Right Bank</td></tr>
<tr><td>  </td><td>No defined banks</td></tr>
</table>

<table>
<tr><th>Site ID</th><th>Watercourse description</th><th colspan="2">Photographs</th></tr>
<tr><td rowspan="4">WC45</td><td rowspan="4">Delta Creek is mapped as being key fish habitat and would be considered type 3 – minimal sensitivity key fish habitat and this watercourse contains aquatic habitat that does not support native aquatic or wetland vegetation. Where the amended project intersects the watercourse, the reach would be classed as class 4 – unlikely fish habitat as this watercourse exhibits little or no defined drainage channel. This reach of Delta Creek did not exhibit defined banks nor was water present during the assessment. The watercourse contained a mix of mostly riparian (Nitre Bush (Nitraria billardierei), Tangled lignum (Duma floribunda) and Black-Box (Eucalyptus largiflorens)), some upland (Climbing Saltbush (Einadia nutans) and Slit-wing Saltbush (Maireana georgii)) and exotic (Perennial Ryegrass (Lolium perenne)) suggesting this reach can be waterlogged. Based on historical data Delta Creek would experience flooding during the 5% AEP flood events as discussed in Technical paper 9 – Revised hydrology, flooding and water quality (WSP, 2026b).

During high floods there is potential that “woody debris” and the vegetation within this reach of Delta creek could act as habitat for Flathead Galaxias and Silver Perch, albeit this is unlikely key fish habitat, instead acting as a migratory corridor.

Although this survey point is not on the exact crossing location, Delta Creek did not exhibit large variation in habitat feature vegetation type. As such it can be concluded that the assessment of this section of this Delta Creek would be the same as the amended project crossing location.</td><td>Downstream</td><td>Left Bank</td></tr>
<tr><td>  </td><td>No defined banks</td></tr>
<tr><td>Upstream</td><td>Right Bank</td></tr>
<tr><td>  </td><td>No defined banks</td></tr>
</table>

<table>
<tr><th>Site ID</th><th>Watercourse description</th><th colspan="2">Photographs</th></tr>
<tr><td rowspan="4">WC47</td><td rowspan="4">Delta Creek is mapped as being key fish habitat and would be considered type 3 – minimal sensitivity key fish habitat and this watercourse contains aquatic habitat that does not support native aquatic or wetland vegetation. Where the amended project intersects the watercourse, the reach would be classed as class 4 – unlikely fish habitat as this watercourse exhibits little or no defined drainage channel. This reach of Delta Creek exhibited did not have a defined banks nor contained water during the survey. However, slightly North and South of the survey point, a more noticeable depression which was 150–200 metres wide was observed. Despite this, the banks were not defined and gently sloped to be 1.0 metres height from the lowest point in the “stream bed”. The watercourse contained a mix of mostly riparian (Nitre Bush (Nitraria billardierei and Black-Box (Eucalyptus largiflorens)), some upland (Slit-wing Saltbush (Maireana georgii) and Australian Tumbleweed (Salsola australis)) and exotic (Perennial Ryegrass (Lolium perenne) and Medic sp.) suggesting this reach can be waterlogged.

Based on historical data Delta Creek would experience flooding during the 5% AEP flood events as discussed in Technical paper 9 – Revised hydrology, flooding and water quality (WSP, 2026b). During these high floods there is potential that “woody debris” and the vegetation within this reach of Delta Creek could act as habitat for Flathead Galaxias and Silver Perch, albeit this is unlikely key fish habitat, instead acting as a migratory corridor.

Although this survey point is not on the exact crossing location, Delta Creek did not exhibit large variation in habitat feature vegetation type. As such it can be concluded that the assessment of this section of this Delta Creek would be the same as the amended project crossing location.</td><td>Downstream</td><td>Left Bank</td></tr>
<tr><td>  </td><td>No defined banks</td></tr>
<tr><td>Upstream</td><td>Right Bank</td></tr>
<tr><td>  </td><td>No defined banks</td></tr>
</table>

<table>
<tr><th>Site ID</th><th>Watercourse description</th><th colspan="2">Photographs</th></tr>
<tr><td rowspan="4">WC48</td><td rowspan="4">Delta Creek is mapped as being key fish habitat and would be considered type 3 – minimal sensitivity key fish habitat and this watercourse contains aquatic habitat that does not support native aquatic or wetland vegetation. Where the amended project intersects the watercourse, the reach would be classed as class 4 – unlikely fish habitat as this watercourse exhibits little or no defined drainage channel. This reach of Delta Creek did not exhibit defined banks nor was water present during the assessment. The low point appeared to be less vegetated and would likely hold water during high rain fall or flooding events. The watercourse contained a mix of riparian such as Nitre Bush (Nitraria billardierei) and Common Cotula (Cotula australis) and exotic species, Perennial Ryegrass (Lolium perenne) and Barley (Hordeum vulgare) suggesting this reach can be waterlogged for short periods of time. Based on historical data Delta Creek would experience flooding during the 5% AEP flood events as discussed in Technical paper 9 – Revised hydrology, flooding and water quality (WSP, 2026b).

Although this watercourse is within the indicative habitat of Flathead Galaxias and Silver Perch, it is highly unlikely this drainage would be key habitat for this species as there are minimal habitat features that would support this species.

Although this survey point is not on the exact crossing location, Delta Creek did not exhibit large variation in habitat feature vegetation type. As such it can be concluded that the assessment of this section of this Delta Creek would be the same as the amended project crossing location..</td><td>Downstream</td><td>Left Bank</td></tr>
<tr><td>  </td><td>No defined banks</td></tr>
<tr><td>Upstream</td><td>Right Bank</td></tr>
<tr><td>  </td><td>No defined banks</td></tr>
</table>

<table>
<tr><th>Site ID</th><th>Watercourse description</th><th colspan="2">Photographs</th></tr>
<tr><td rowspan="4">WC49</td><td rowspan="4">Delta Creek is mapped as being key fish habitat and would be considered type 3 – minimal sensitivity key fish habitat and this watercourse contains aquatic habitat that does not support native aquatic or wetland vegetation. Where the amended project intersects the watercourse, the reach would be classed as class 4 – unlikely fish habitat as this watercourse exhibits little or no defined drainage channel. This reach of Delta Creek exhibited a more noticeable depression which was over 100 metres wide, however, the banks were not defined and were only 0.6 metres in height from the lowest point from the “stream bed”. The watercourse contained a mix of riparian (Nitre Bush (Nitraria billardierei) and Common Cotula (Cotula australis)), upland (Creeping Saltbush (Atriplex semibaccata) and Panicum sp.) and exotic (Perennial Ryegrass (Lolium perenne) and Barley (Hordeum vulgare)) species suggesting this reach can be both waterlogged but and dry for long periods of time. Based on historical data Delta Creek would experience flooding during the 5% AEP flood events as discussed in Technical paper 9 – Revised hydrology, flooding and water quality (WSP, 2026b).

Although this watercourse is within the indicative habitat of Flathead Galaxias and Silver Perch, it is highly unlikely this drainage would be key habitat for this species as there are minimal habitat features that would support this species.

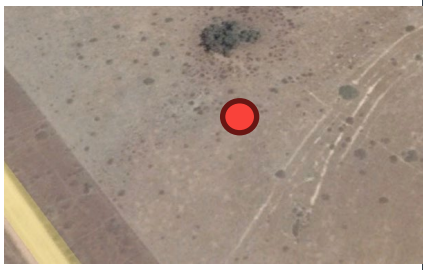
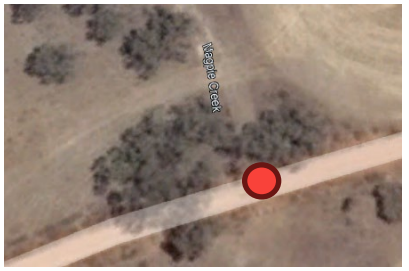
Although this survey point is not on the exact crossing location, Delta Creek did not exhibit large variation in habitat feature vegetation type. As such it can be concluded that the type and class of this section of this Delta Creek would be the same as the amended project crossing location.</td><td>Downstream</td><td>Left Bank</td></tr>
<tr><td>  </td><td>No defined banks</td></tr>
<tr><td>Upstream</td><td>Right Bank</td></tr>
<tr><td>  </td><td>No defined banks</td></tr>
</table>

4.3.2 Watercourse crossing desktop assessment

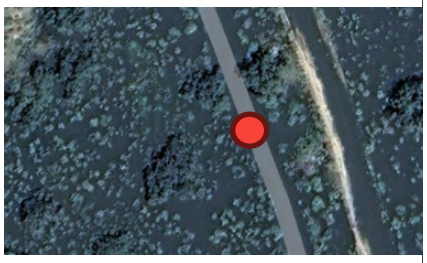
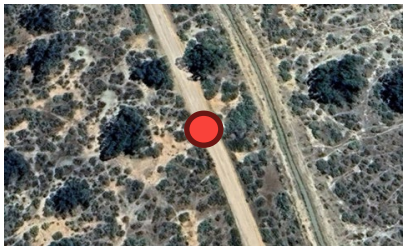
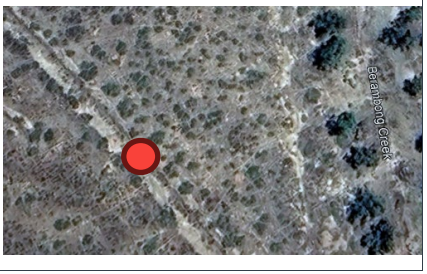
The below watercourse were identified as being potentially high value aquatic habitat in the desktop assessments based on aerial photographs and fisheries portal mapping. To verify this, field verification was warranted. The field assessment determined that the watercourse did not contain high-valued habitat features, and as such were not assessed as being key fish habitat.

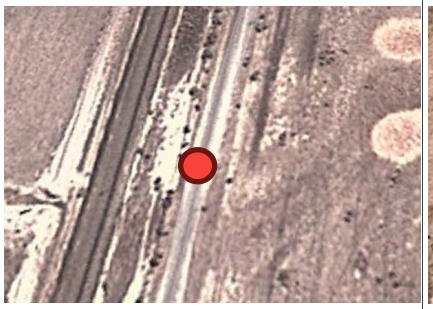
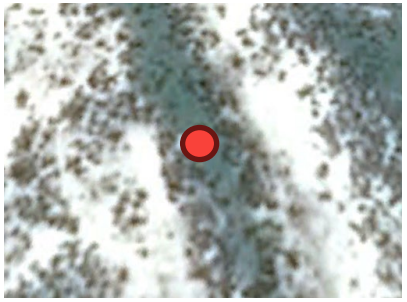
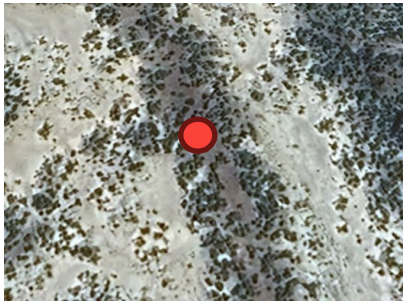
For the 23 crossings that could not be surveyed, a desktop assessment using aerial photography was completed (refer to Table 4.8). As this assessment cannot determine habitat features, the type and class of the watercourse cannot be determined or confirmed, however, broad assumptions of the watercourse have be made for the purposes of this assessment. It is recommended that all crossing locations subject to desktop assessment be field verified during detailed design and further construction planning to confirm the presence of key fish habitat and the need for further mitigation or offsetting as required. Based on aerial photography, eight watercourses did not appear to exhibit and defined banks or channels, four watercourses appear to be irrigation drainages and 11 watercourses appear to have defined banks and are natural.

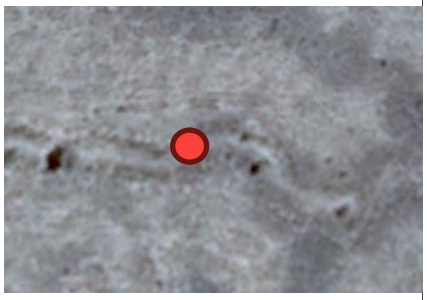
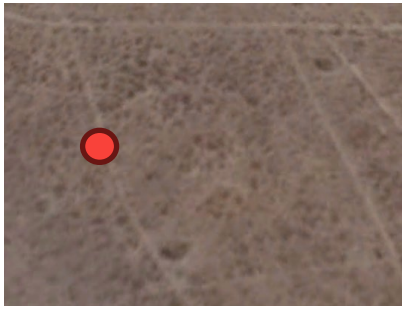
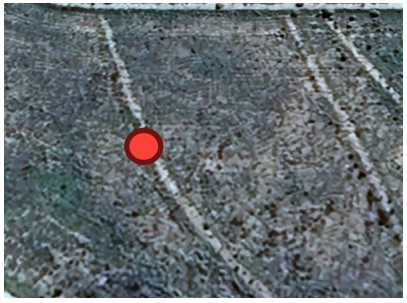
Table 4.8 Desktop assessment of unsurveyed watercourse crossings

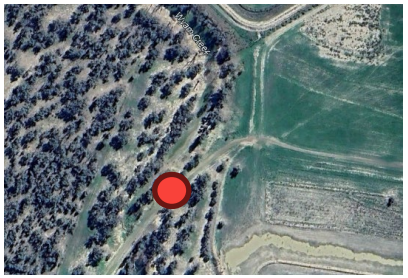
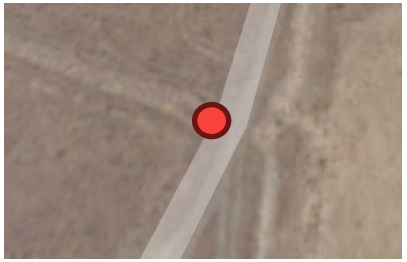
Site ID	Description	Aerial photograph (crossing location is represented by the red point)	
New WC01	Based on aerial imagery this watercourse appears to have the capacity to flood during wet periods but can also run dry during wet conditions. This is likely due to the modified nature of this watercourse, as there is a dam located to the south and appears to be connected to a man-made irrigation system. It is unlikely that this is key fish habitat, but field verification is recommended.	2011 	2023 
New WC02	Based on aerial imagery this watercourse appears to be ephemeral and likely only flows after rainfall events. It appears that in the last few years a man-made irrigation drainage was constructed. It is likely that the impact area is subject to flooding from the modified channel to the south (evident in the 2024 aerial imagery). It is unlikely that this is key fish habitat, but field verification is recommended.	2014 	2024 
New WC03	Based on aerial imagery Magpie Creek appears to be intermittent and likely only flows after rainfall events and during the wetter months. Providing habitat for threatened and protected fish species during periods of flow. Magpie Creek is mapped as key fish habitat. However, field verification is recommended to determine exact type and class.	2014 	2024 

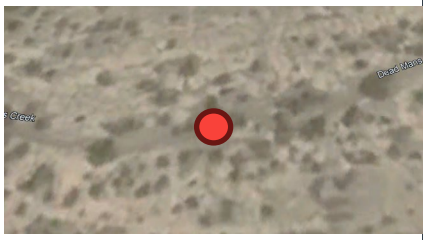
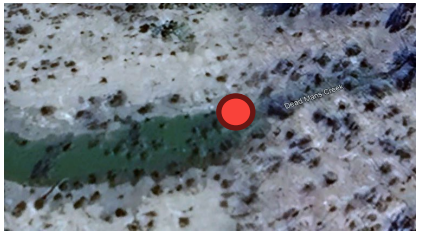
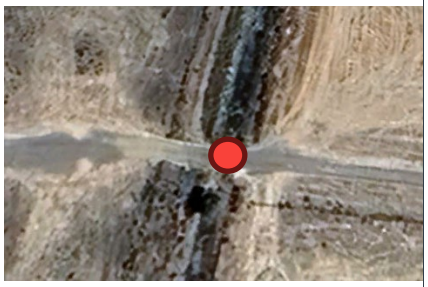
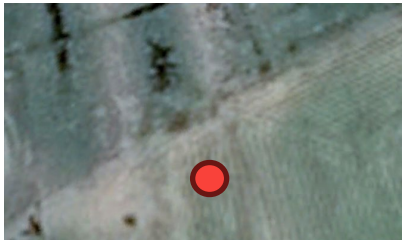
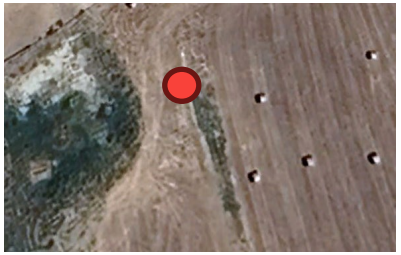
Site ID	Description	Aerial photograph (crossing location is represented by the red point)	
New WC04	Based on aerial imagery, Magpie Creek appears to be intermittent and likely only flows after rainfall events and during the wetter months. Providing temporary habitat for freshwater fauna during periods of flow. Magpie Creek is mapped as key fish habitat. However, field verification is recommended to determine exact type and class.	2002 	2024 
New WC05	Based on aerial imagery this watercourse appears to be an ephemeral drainage and likely only flows after rainfall events or when the perennial stream to the north overtops its banks. There is a distinct lack of channel definition at the impact location. Further, vegetation appears to be homogenous with the surrounding landscape, suggesting terrestrial dominant vegetation. It is unlikely that this is key fish habitat, but field verification is recommended.	2014 	2024 
New WC06	Based on aerial imagery this watercourse appears to be an ephemeral drainage and likely only flows after rainfall events. There is a distinct lack of channel definition at the impact location. Further, vegetation appears to be homogenous with the surrounding landscape, suggesting terrestrial dominant vegetation. It is unlikely that this is key fish habitat, but field verification is recommended.	2002 	2023 

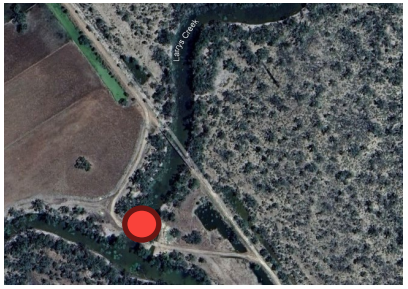
Site ID	Description	Aerial photograph (crossing location is represented by the red point)	
New WC07	Based on aerial imagery Berambong Creek appears to lack defined banks and channel and likely only flows after rainfall events. Further, vegetation appears to be homogenous with the surrounding landscape, suggesting terrestrial dominant vegetation. Berambong Creek is mapped as key fish habitat. Field verification is recommended to determine exact type and class.	2014 	2024 
New WC08	Based on aerial imagery this watercourse appears only flows after rainfall events and during the wetter months. The watercourse at this location appears to be within a flood plain and is likely to be periodically inundated providing temporary habitat for freshwater fauna, and connectivity to surrounding tributaries. It is unlikely that this is key fish habitat, but field verification is recommended.	2022 	2024 
New WC11	Based on aerial imagery this watercourse appears to be ephemeral and likely only flows after rainfall events. There is a distinct lack of channel definition at the impact location. Further, vegetation appears to be homogenous with the surrounding landscape, suggesting terrestrial dominant vegetation. It is unlikely that this is key fish habitat, but field verification is recommended.	2014 	2024 

Site ID	Description	Aerial photograph (crossing location is represented by the red point)	
New WC12	Based on aerial imagery Moores Creek appears to be ephemeral and likely only flows after rainfall events. There is a distinct lack of channel definition at the impact location. Further, vegetation appears to be homogenous with the surrounding landscape, suggesting terrestrial dominant vegetation. It is unlikely that this is key fish habitat, but field verification is recommended.	2013 	2024 
WC01	Based on aerial imagery this watercourse appears to be an ephemeral drainage and likely only flows after rainfall events. It appears there may be a change in vegetation type potentially indicating a distinction between riparian and terrestrial vegetation types. There is potential that the watercourse at this location provides some key fish habitat features for Muray Hardyhead, but field verification is recommended.	2021 	2024 
WC02	This watercourse appears to be perennial, with visible flows and a defined channel during both wetter and dryer seasons. It's likely that this watercourse provides aquatic habitat all year. There is potential that the watercourse at this location provides some key fish habitat features for Muray Hardyhead, but field verification is recommended.	2013 	2023 

Site ID	Description	Aerial photograph (crossing location is represented by the red point)	
WC08	Based on aerial imagery this watercourse appears to be intermittent and likely only flows after rainfall events and during the wetter months. There is a defined channel at the impact location. There appears to be a lack of terrestrial vegetation within the channel, suggesting periodic flows and dominance of aquatic tolerant species. There is potential that the watercourse at this location provides some key fish habitat features for Muray Hardyhead, but field verification is recommended.	2013 	2023 
WC09	Based on aerial imagery this watercourse appears to be intermittent and likely only flows after rainfall events and during the wetter months. There is a distinct lack of channel definition at the impact location. Further, there appears to be a lack of terrestrial vegetation within the channel, suggesting periodic flows and dominance of aquatic tolerant species. There is potential that the watercourse at this location provides some key fish habitat features for Muray Hardyhead, but field verification is recommended.	2021 	2024 
WC14	Based on aerial imagery this watercourse appears to be an ephemeral drainage and likely only flows after rainfall events. There is a distinct lack of channel definition at the impact location. Further, vegetation appears to be homogenous with the surrounding landscape, suggesting terrestrial dominant vegetation. It is unlikely that this is key fish habitat, but field verification is recommended.	2014 	2023 

Site ID	Description	Aerial photograph (crossing location is represented by the red point)	
WC16	Based on the aerial photographs, Larry Creek is a permanent watercourse and provides permanent year-round habitat for freshwater fauna and fish, it appears to have distinct vegetation in the riparian area and a defined channel and banks. Larrys Creek is mapped as key fish habitat. However, field verification is recommended to determine exact type and class.	2021 	2024 
WC19	Based on the aerial photographs, at this location, Wyam Creek appears to have a defined channel downstream of the current crossing, but less defined upstream. This could indicate the current crossing is impacting drainage and fish passage. An assessment on Wyam Creek was completed during the field survey, however it is over 500 metres from the assessment location. Wyam Creek exhibited a large variation in habitat type and features within the 500-metre assessment area. Wyam Creek is mapped as key fish habitat. However, field verification is recommended to determine exact type and class.	2018 	2024 
WC22	This watercourse appears to be intermittent and heavily modified as evident by the straightened drain-like channel beneath the current access track. It is likely to provide some temporary habitat for freshwater fauna during the wetter months. It is unlikely that this is key fish habitat, but field verification is recommended.	2014 	2024 

Site ID	Description	Aerial photograph (crossing location is represented by the red point)	
WC24	Dead Mans Creek appears to be an intermittent waterbody and likely only flows for a short duration after rainfall events and during the wetter months. Providing temporary habitat for freshwater fauna during flow events. Dead Mans Creek is mapped as key fish habitat. However, field verification is recommended to determine exact type and class.	2014 	2024 
WC35	Based on aerial imagery this watercourse appears to be man-made irrigation drainage. There is a distinct lack of channel definition at the impact location. Further, vegetation appears to be homogenous with the surrounding landscape, suggesting terrestrial dominant vegetation. It is unlikely that this is key fish habitat, but field verification is recommended.	2011 	2023 
WC37	Based on aerial imagery this watercourse appears to be man-made irrigation drainage. There is a distinct lack of channel definition at the impact location. Further, vegetation appears to be homogenous with the surrounding landscape, suggesting terrestrial dominant vegetation. It is unlikely that this is key fish habitat, but field verification is recommended.	2013 	2023 

Site ID	Description	Aerial photograph (crossing location is represented by the red point)	
WC38	Based on aerial imagery this watercourse appears to be a man-made irrigation drainage, but remains wetted for a large portion of the year. There is evidence of some channel definition at the impact location, however, the watercourse appears to be heavily modified with straightened channels. There appears to be a lack of terrestrial vegetation within the channel, suggesting periodic flows and dominance of aquatic tolerant species. It is unlikely that this is key fish habitat, but field verification is recommended.	2013 	2023 
WC59	Based on the aerial photographs Larry Creek is a permanent watercourse and provides permanent year-round habitat for freshwater fauna, it appears to have distinct vegetation in the riparian area and a defined channel and banks. Larrys Creek is mapped as key fish habitat. However, field verification is recommended to determine exact type and class.	2021 	2023 

4.3.3 Summary of watercourse crossings for field survey and desktop assessment

Based on the assessment completed in section 4.3.1 each watercourse was assigned a type and class. Table 4.9 provides a summary of results of all the assessed watercourses.

The information obtained from these assessments will be used to determine the appropriate design requirements (i.e. crossing structures), infrastructure placement (i.e. avoid riparian areas of important habitat) and construction techniques (i.e. appropriate dewatering techniques, appropriate mitigation measures). It will also determine the potential long term impact to each threatened species that has the potential to inhabit each watercourse.

Table 4.9 Fish habitat assessment outcome overview at survey locations

Site ID	Watercourse name or TopoID (if unnamed watercourse)	Mapped as:		Characteristics present that define key habitat sensitivity type (as per Table 3.3)					Key habitat sensitivity type	Classification of waterway	Water quality support fish	Fish passage barriers
		indicative distribution of threatened species	key fish habitat	Gravel Bed	Rock >500 millimetres	Snag >300 millimetres and 3 metres	Native aquatic vegetation	Critical or threatened species habitat				
Surveyed watercourse crossing locations												
WC36	500207234	Yes	No	–	–	–	–	–	N/A – SO< 3	N/A – SO<3	No water	P (no water, banks or channels)
WC17	514749747	Yes	Yes	–	–	–	–	–	Type 3	Class 3	Too shallow to measure	Y (current access track blocks passage)
WC31	Southern No 26	Yes	No[1]	–	–	–	–	–	Type 3	Class 3	Yes	N (does not appear to have immediate fish passage issues)
WC34a	Coleambally Outfall Drain	Yes	Yes	–	–	–	Y (US)	–	Type 3	Class 3	No water	P (DS a bridge and fence may act as a barrier)
WC34b	Coleambally Outfall Drain	Yes	Yes	–	–	–	Y (US)	–	Type 3	Class 3	No water	P (DS a bridge and fence may act as a barrier)

[1] Although Southern No 26 is an irrigation channel, which is typically exempt from protection under the *Policy and guidelines for fish habitat conservation and management (Update 2013),* it has been confirmed by the landowner, that Murray Cod (an EPBC Act (Cth) species) commonly inhabits this watercourse. As such a type and class rating was assigned to this watercourse as it requires appropriate crossing structure and mitigation measure to ensure the watercourse can continue to support Murray Cod.

Site ID	Watercourse name or TopoID (if unnamed watercourse)	Mapped as:		Characteristics present that define key habitat sensitivity type (as per Table 3.3)					Key habitat sensitivity type	Classification of waterway	Water quality support fish	Fish passage barriers
		indicative distribution of threatened species	key fish habitat	Gravel Bed	Rock >500 millimetres	Snag >300 millimetres and 3 metres	Native aquatic vegetation	Critical or threatened species habitat				
WC29	Carroonboon Creek	Yes	No	–	–	–	–	–	N/A – SO<3	N/A – SO<3	No water	Y (no water, banks or channels)
WC40	515390563	Yes	No	–	–	–	–	–	N/A –irrigation channel	N/A –irrigation channel	No water	Y (does not appear to connect to a fish bearing watercourse)
WC41	515390563	Yes	No	–	–	–	–	–	N/A –irrigation channel	N/A –irrigation channel	No water	Y (does not appear to connect to fish bearing watercourses)
WC04	503921525	Yes	No	–	–	–	–	–	N/A – SO<3	N/A – SO<3	No water	P (no water, banks or channels)
WC05	Carroonboon Creek	Yes	No	–	–	–	–	–	N/A – SO<3	N/A – SO<3	No water	P (no water, banks or channels)
WC32	503921506	Yes	Yes	–	–	–	Y	–	Type 1	Class 2	Yes	Y (culvert blocked)
WC33	515393785	Yes	No	–	–	–	Y	–	N/A –irrigation channel	N/A –irrigation channel	No water	Y (does not appear to connect to a fish bearing watercourse)
WC46	Delta Creek	Yes	No	–	–	–	–	–	Type 3	Class 4	No water	P (no water, banks or channels)

Site ID	Watercourse name or TopoID (if unnamed watercourse)	Mapped as:		Characteristics present that define key habitat sensitivity type (as per Table 3.3)					Key habitat sensitivity type	Classification of waterway	Water quality support fish	Fish passage barriers
		indicative distribution of threatened species	key fish habitat	Gravel Bed	Rock >500 millimetres	Snag >300 millimetres and 3 metres	Native aquatic vegetation	Critical or threatened species habitat				
WC53	517027560	No	Yes	–	–	–	–	–	Type 3	Class 3	No water	Y (crushed culvert downstream)
WC54	500837738	No	Yes	Y	–	Y	Y (US)	–	Type 1	Class 2	Yes	Y (current crossing impedes fish passage)
Extrapolated watercourse crossing locations												
WC06	514830725	Yes	No	–	–	–	–	–	N/A – SO<3	N/A – SO<3	No water	P (no water, banks or channels)
WC07	Carroonboon Creek	Yes	Yes	–	–	–	–	–	Type 3	Class 4	No water	P (no water, banks or channels)
WC18	Jaffrey Creek	Yes	Yes	–	–	Y	Y	P	Type 1	Class 2	Yes – water upstream	Y (debris blocks passage near bridge)
WC21a	500209789	Yes	No	–	–	–	–	–	N/A – SO<3	N/A – SO<3	No water	P (no water, banks or channels)
WC21b	500209789	Yes	No	–	–	–	–	–	N/A – SO<3	N/A – SO<3	No water	P (no water, banks or channels)

Site ID	Watercourse name or TopoID (if unnamed watercourse)	Mapped as:		Characteristics present that define key habitat sensitivity type (as per Table 3.3)					Key habitat sensitivity type	Classification of waterway	Water quality support fish	Fish passage barriers
		indicative distribution of threatened species	key fish habitat	Gravel Bed	Rock >500 millimetres	Snag >300 millimetres and 3 metres	Native aquatic vegetation	Critical or threatened species habitat				
WC44	Delta Creek	Yes	Yes	–	–	–	–	–	Type 3	Class 4	No water	P (no water, banks or channels)
WC45	Delta Creek	Yes	Yes	–	–	–	–	–	Type 3	Class 4	No water	P (no water, banks or channels)
WC47	Delta Creek	Yes	Yes	–	–	–	–	–	Type 3	Class 4	No water	P (no water, banks or channels)
WC48	Delta Creek	Yes	Yes	–	–	–	–	–	Type 3	Class 4	No water	P (no water, banks or channels)
WC49	Delta Creek	Yes	Yes	–	–	–	–	–	Type 3	Class 4	No water	P (no water, banks or channels)
Desktop assessed watercourse crossings (based on aerial imagery)												
New WC01	514749992	Yes	No	Field verification required								P (appears the road on either side of the watercourse may act as barrier)
New WC02	500201767	Yes	No	Field verification required								N (does not appear to have immediate fish passage issues)

Site ID	Watercourse name or TopoID (if unnamed watercourse)	Mapped as:		Characteristics present that define key habitat sensitivity type (as per Table 3.3)					Key habitat sensitivity type	Classification of waterway	Water quality support fish	Fish passage barriers
		indicative distribution of threatened species	key fish habitat	Gravel Bed	Rock >500 millimetres	Snag >300 millimetres and 3 metres	Native aquatic vegetation	Critical or threatened species habitat				
New WC03	Magpie Creek	Yes	Yes	Field verification required								N (does not appear to have immediate fish passage issues)
New WC04	Magpie Creek	Yes	Yes	Field verification required								P (current crossing appears to create a slight bottleneck, however, fish passage may be possible)
New WC05	500202374	Yes	No	Field verification required								Y (appears to have no bank or channel)
New WC06	500204586	Yes	No	Field verification required								Y (appears to have no bank or channel)
New WC07	Berambong Creek	Yes	Yes	Field verification required								Y (appears to have no bank or channel)
New WC08	517049290	Yes	No	Field verification required								Y (appears to have no bank or channel)
New WC11	500205369	Yes	No	Field verification required								Y (appears to have no bank or channel)

Site ID	Watercourse name or TopoID (if unnamed watercourse)	Mapped as:		Characteristics present that define key habitat sensitivity type (as per Table 3.3)					Key habitat sensitivity type	Classification of waterway	Water quality support fish	Fish passage barriers
		indicative distribution of threatened species	key fish habitat	Gravel Bed	Rock >500 millimetres	Snag >300 millimetres and 3 metres	Native aquatic vegetation	Critical or threatened species habitat				
New WC12	Moores Creek	Yes	No	Field verification required								Y (appears to have no bank or channel)
WC01	500205153	Yes	No	Field verification required								P (current crossing appears to create a slight bottleneck, however, fish passage may be possible)
WC02	500205126	Yes	No	Field verification required								N (does not appear to have immediate fish passage issues)
WC08	500207683	Yes	No	Field verification required								N (does not appear to have immediate fish passage issues)
WC09	500209348	Yes	No	Field verification required								Y (current crossing appears to impede fish passage)
WC14	500209369	Yes	No	Field verification required								Y (appears to have no bank or channel)

Site ID	Watercourse name or TopoID (if unnamed watercourse)	Mapped as:		Characteristics present that define key habitat sensitivity type (as per Table 3.3)					Key habitat sensitivity type	Classification of waterway	Water quality support fish	Fish passage barriers
		indicative distribution of threatened species	key fish habitat	Gravel Bed	Rock >500 millimetres	Snag >300 millimetres and 3 metres	Native aquatic vegetation	Critical or threatened species habitat				
WC16	Larrys Creek	Yes	Yes	Field verification required								N (does not appear to have immediate fish passage issues)
WC19	Wyam Creek	Yes	Yes	Field verification required								Y (current crossing appears to impede fish passage)
WC22	500209176	Yes	No	Field verification required								N (does not appear to have immediate fish passage issues)
WC24	Dead Mans Creek	Yes	Yes	Field verification required								N (does not appear to have immediate fish passage issues)
WC35	500207342	Yes	Yes	Field verification required								N (does not appear to have immediate fish passage issues)
WC37	500207150	Yes	No	Field verification required								Y (appears to have no bank or channel)

Site ID	Watercourse name or TopoID (if unnamed watercourse)	Mapped as:		Characteristics present that define key habitat sensitivity type (as per Table 3.3)					Key habitat sensitivity type	Classification of waterway	Water quality support fish	Fish passage barriers
		indicative distribution of threatened species	key fish habitat	Gravel Bed	Rock >500 millimetres	Snag >300 millimetres and 3 metres	Native aquatic vegetation	Critical or threatened species habitat				
WC38	500207150	Yes	No	Field verification required								N (does not appear to have immediate fish passage issues)
WC59	Larrys Creek	Yes	No	Field verification required								N (does not appear to have immediate fish passage issues)

SO = Strahler Order; P = potential; Y = yes; US = upstream; DS = downstream. m = metres; mm = millimetres; Unk = unknown

5 Potential impacts

The aquatic receptors most likely to be impacted by the amended project include:

- key fish habitat
- aquatic invertebrates
- water quality
- aquatic vertebrates
- native plants inhabiting the riparian zone (i.e. removal or introduction of invasives).

The assessment of the existing environment determined that:

- NSW/Victorian border to the Dinawan substation component contained:
  - 22 named watercourses are mapped as key fish habitat and/or within indicative distribution area for threatened species listed under the EPBC Act (Cth) or FM Act (NSW)
  - 29 unnamed watercourses are mapped as key fish habitat or are within the distribution area of Murray Hardyhead habitat
- the network augmentation works amended study area contained:
  - two named watercourses are mapped as key fish habitat and/or within indicative distribution area for threatened species listed under the EPBC Act (Cth) or FM Act (NSW)
  - two unnamed crossings are mapped as key fish habitat.

In defining the amended project footprint, it has been conservatively assumed that any area within the amended project footprint has the potential to be directly impacted by the amended project. However, not all the land within the amended project footprint would be used for construction and/or operation. This provides flexibility for future design development and provides an assessment of the potential 'worst-case impacts' despite the project only impacting a portion of the amended project footprint. The exception to this is the biodiversity assessment as presented in *Technical paper 1 – Revised Biodiversity Development Assessment Report* (WSP, 2026a) (which this report is appended to) which has assumed an indicative disturbance footprint. The indicative disturbance footprint for transmission line structures and brake and winch sites has been used in the following assessment to identify potential impacts to aquatic habitats.

The potential impacts during construction and operation and how they relate to aquatic receptors are discussed in the following sections.

5.1 Construction assessment

Construction of the amended project is expected to interact with the aquatic environment and/or riparian vegetation, resulting in direct and indirect impacts. The potential impacts are summarised in Table 5.1. These potential impacts are largely associated with the construction of transmission line structures in the vicinity of watercourses, the construction of new or upgraded access tracks with watercourse crossings, or the establishment of construction compounds or temporary worker accommodation facilities that directly impact a watercourse. The potential impacts from these activities are discussed section 5.1.1, 5.1.2 and 5.1.3.

Table 5.1 Potential construction impacts

Impact	Description	Relevant construction activities
Introduction of invasive species and diseases	Common diseases include Epizootic Haematopoietic Necrosis Virus, Asian tape worms, protozoans and funguses and common invasive species including Redfin, Goldfish and Carp (refer to Appendix A for further information)	All activities within or in the vicinity of a watercourse.
Riparian vegetation removal, change in habitat structure and cover and/or removal of key fish habitat. Die off of riparian vegetation	Instream works or removal of riparian vegetation may result in the removal of habitat features, such as snags, overhanging habitat, aquatic vegetation and large boulders. Removal of riparian vegetation may result in bank instability and erosion. Die off may occur as a result tree removal or pruning.	All activities where direct impacts to riparian areas occur.
Change in quantity and quality of food supply	The removal of riparian vegetation or trimming of riparian vegetation may result in a change in the quantity or composition of the food supply (e.g. plants and organic debris) that falls into a watercourse, or the nutrient inputs into a watercourse.	All activities where direct impacts to riparian areas occur.
Reduction in water quality within watercourses	May include sedimentation of watercourses, increased nutrient concentrations or chemicals entering watercourses (if not properly managed). Impacts may include degradation of aquatic habitats or mortality of fish, eggs or ova due to smothering by sediments. This would be associated with instream activities, clearing, grubbing, excavation activities within or near a watercourse, runoff from stockpiles, construction compounds, temporary worker accommodation facilities, use of equipment and vehicles near or on a watercourses, improper management of wastes, or accidental spills.	All activities within or in the vicinity of a watercourse
Blockage of fish passage	While any instream works would be conducted in a manner that avoids full blockage of fish passage, incidents could occur that result in full fish blockage.	Where instream works are proposed for watercourse crossings, or where works occur in proximity to a watercourse.
Changes to flows within watercourses	Changes to the duration, timing or volume of flows into a watercourse due to changes in flow distribution, or placement of materials or structures within a watercourse that fully or partially obstruct the flow of water temporarily. Impacts include fish becoming stranded due to reduction in flow.	Changes in flow may occur due to the construction of transmission line structures or watercourse crossings, or where changes to surface levels occur due to the establishment of construction compounds and combined temporary worker accommodation facilities.

Impact	Description	Relevant construction activities
Fish, eggs or ova mortality due to direct impact	Sedimentation results in death of egg or ova via suffocation or habitat removal.	Direct impact may occur when construction equipment or construction vehicles enters a watercourse during construction or when crossing.

5.1.1 Transmission lines

The construction of the transmission line is not expected to have a major impact on aquatic receptors. No transmission line structures would be constructed within 50 metres from the edge of the higher order watercourses (being stream order four and above), which would satisfy the vegetated riparian zone (VRZ) requirement. Around 15 transmission line structures would be located within 50 metres of a lower order watercourse, and seven would be located within 50 metres of an irrigation channel.

However, the construction of a transmission line structure would temporarily require a larger cleared area of up to 70 metres by 70 metres for the 500 kV transmission line structures. Some additional areas would also be cleared to support stringing activities from the ground (brake and winch sites). The indicative disturbance footprint associated with 48 transmission line structures (including brake and winch sites) for the NSW/Victorian border to the Dinawan substation component would be located within 50 metres from the edge of watercourses. Of these, six are within the applicable VRZ of a watercourse that has been mapped as key fish habitat and/or mapped in the distribution of a threatened aquatic species (being three unnamed watercourses (Strahler order zero, one and three), Merran Creek (Strahler order 10), Magpie Creek (Strahler order two) and Cunninyeuk Creek (Strahler order three).

Construction of the transmission lines would also involve:

- construction work within the larger riparian buffers as identified in *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries, 2013). This includes the total Indicative disturbance footprint for a new transmission line structure encroaches within 50 to 100 metres of the Murray River
- trimming of riparian vegetation to enable the stringing of transmission lines or to achieve minimal distance between the transmission line structures, once operational
- potential stringing activities being supported by watercraft
- temporary installation of safety netting over watercourses during stringing activities that do not include watercrafts.

Direct impacts to watercourses could result in a change in flow paths and direct disturbance to banks and channels, resulting in direct impacts to fish and fish habitat. Removal of riparian vegetation would increase the susceptibility to bed and bank erosion, resulting in sedimentation and the release of deleterious substances into aquatic habitats and contributing to the degradation of aquatic habitats. General construction activity in, on or within the vicinity of watercourse may also present water quality impacts (if not properly managed). Following construction, disturbed areas within riparian areas would be stabilised and rehabilitated following the completion of construction activities.

Construction of the transmission line within the vicinity of larger order watercourses is unlikely to result in long-term harmful alteration, disruption and destruction to fish and fish habitat given that direct, instream impacts would not occur. Indirect impacts to fish or fish habitat that may occur, if not properly managed, include:

- introduction of invasive species and diseases
- change in quantity and quality of food supply
- riparian vegetation die-off
- reduction in water quality.

Construction of transmission lines within the riparian area and within the instream area would directly impact lower order watercourses. For watercourses that have the potential support aquatic fauna or contain key fish habitat, the direct and indirect impacts are likely to result in long-term harmful alteration, disruption and destruction to fish and fish habitat. Direct and indirect impacts to fish and fish habitat include:

- introduction of invasive species and diseases
- removal of riparian vegetation, change in habitat structure and cover, and/or direct removal of fish or key fish habitat
- change in quantity and quality of food supply
- reduction in water quality
- direct impact to fish, eggs or ova
- blockage of fish passage
- potential mortality of fish/eggs/ova due to direct impacts by vehicles or plant and equipment
- change in water flows within a watercourse.

5.1.2 Access tracks

Access tracks would need to be established to accommodate safe access of construction machinery and vehicles to the amended project footprint, including work areas along the project transmission line corridor, combined temporary worker accommodation facilities and construction compounds. The access tracks proposed include new tracks or upgrades to existing tracks, which may require new or upgraded watercourse crossings. While the selection of the proposed access tracks has sought to avoid crossing watercourses where possible, it is anticipated that a number of watercourse crossings would be required. Structural assessments of existing crossings would be completed during detailed design and further construction planning, which may identify the need for existing crossings to be upgraded.

All new or upgraded crossings would be designed, installed and maintained in accordance with relevant guidelines for watercourse crossings including:

- *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries I, 2013)
- *Why do fish need to cross the road? Fish Passage Requirements for Waterway Crossings* (Fairfull and Witheridge, 2003)
- *Controlled activities – Guidelines for watercourse crossings on waterfront land* (NSW Department of Climate Change, Energy, the Environment and Water, 2025b)
- *Controlled activities – Guidelines for riparian corridors on waterfront land* (NSW Department of Climate Change, Energy, the Environment and Water, 2025a)
- *Managing Urban Stormwater: Soils and Construction – Volume 1, 4th Edition* (Landcom, 2004)
- *Guidelines for the planning, construction and maintenance of tracks* (Department of Land and Water Conservation, 1994)
- *Managing Urban Stormwater: Soils and Construction – Volume 2C Unsealed Roads* (Department of Environment and Climate Change, 2008a).

Where a new or upgraded crossing is required, the design would be determined based on the habitat attributes of the watercourse would be confirmed following a site visit in accordance with *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries , 2013) and *Why do fish need to cross the road? Fish Passage Requirements for Waterway Crossings* (Fairfull and Witheridge, 2003). This is discussed in section 5.3.

The construction of new access track crossings or the upgrade of existing access track crossings is likely to have both direct and indirect impacts to the aquatic habitats. Depending on the extent of construction required, removal of riparian vegetation and excavation of the streambeds may be required. Other project-related activities that may result in impacts to fish or fish habitat include:

- placement of materials or structures in water: this could include the placement of structures that either fully or partially obstruct the flow of water and may include temporary structures
- use of industrial equipment: the use of mechanical equipment for the purpose of construction, maintenance and/or transportation
- resurfacing of the current access tracks. This could result in the runoff of chemicals that could impact water quality
- change in timing, duration and frequency of flows within a watercourse. This includes the construction of temporary exclusion zones.

For watercourses that have the potential support aquatic fauna or contain key fish habitat, the potential direct and indirect impacts to fish and fish habitat include:

- introduction of invasive species and diseases
- removal of riparian vegetation, change in habitat structure and cover, and/or direct removal of fish or key fish habitat
- change in quantity and quality of food supply
- reduction in water quality
- direct impact to fish, eggs or ova
- blockage of fish passage
- potential mortality of fish/eggs/ova due to direct impacts by vehicles, plant and equipment
- change in water flows within a watercourse.

The named watercourses that are expected to be directly impacted by a watercourse crossing are outlined in Table 5.2. Ten new access tracks are expected to be constructed at watercourses that have mapped key fish habitats and are also within the indicative distribution area of threatened species. An additional 11 watercourse crossings may require works to upgrade the existing crossing. For the purpose of this assessment, the worse-case scenario that all existing watercourse crossings require upgrading has been presumed, however, it is likely many would be adequate and not require instream works.

Potential instream works would increase impacts on threatened species at these access track locations.

It is noted that any upgrade to existing crossings for irrigation channels such as Southern No. 26 Channel and the Coleambally Outfall Drain (also referred to as the West Coleambally Channel) would be designed in consultation with the asset owner and would not obstruct channel flows.

Table 5.2 Named watercourse and access tracks crossings mapped as key fish habitat or having indicative threatened species distribution

Watercourse name	Stream order	Number of crossings	Existing crossings to be upgraded	New access track	Mapped key fish habitat	Indicative threatened species distribution	Assessment type
Berambong Creek	10	1	0	1	Yes	Silver Perch and Murray Hardyhead	Desktop (1)
Carroonboon Creek	1, 2, 3	3	2	1	Yes	Murray Hardyhead	Site Visit (2) Extrapolated (1)
Coleambally Outfall Drain	9	2	1	1	Yes	Silver Perch and Murray Hardyhead	Site Visit (2)
Deadmans Creek	10	1	0	1	Yes	Murray Hardyhead	Desktop (1)
Delta Creek	3	6	1	5	Yes	Silver Perch and Flathead Galaxias	Site Visit (1) Extrapolated (5)
Jaffrey Creek	10	1	1	0	Yes	Silver Perch, Murray Spiny Crayfish and Flathead Galaxias	Extrapolated
Larrys Creek	10	2	2	0	Yes	Murray Hardyhead	Desktop (2)
Magpie Creek	2	2	2	0	Yes	Murray Hardyhead	Desktop (2)
Morres Creek	1	1	1	0	Yes	Murray Hardyhead	Desktop (1)
Southern No. 26	0	1	0	1	Yes	Murray Hardyhead	Site Visit (1)
Wyam Creek	10	1	1	0	Yes	Silver Perch, Murray Spiny Crayfish and Flathead Galaxias	Desktop (1)
Total			**11**	**10**			

In addition to the named watercourses, 24 unnamed watercourses or drainage lines that are mapped as key fish habitat or within the indicative distribution of a threatened species, would be directly impacted by the construction of a new or upgraded access track. A total of 27 crossings across the 24 unnamed watercourses would be required (Table 5.3).

Table 5.3 Unnamed watercourse and access tracks crossings mapped as key fish habitat or having indicative threatened species distribution

TopoID	Assessment ID	Stream order	Number of crossings	Existing crossings to be upgraded	New access track	Mapped key fish habitat	Indicative threatened species distribution	Assessment type
514749992	New_WC01	1	1	0	1	Yes	Murray Hardyhead	Desktop assessment
500201767	New_WC02	1	1	0	1	No	Murray Hardyhead	Desktop assessment
500202374	New_WC05	3	1	0	1	Yes	Murray Hardyhead	Desktop assessment
500204586	New_WC06	1	1	0	1	No	Murray Hardyhead	Desktop assessment
517049290	New_WC08	1	1	1	0	No	Murray Hardyhead	Desktop assessment
500205369	New_WC11	0	1	0	1	No	Murray Hardyhead	Desktop assessment
500205153	WC01	1	1	0	1	No	Murray Hardyhead	Desktop assessment
500205126	WC02	1	1	0	1	No	Murray Hardyhead	Desktop assessment
503921525	WC04	2	1	1	0	No	Murray Hardyhead	Site Visit
514830725	WC06	1	1	1	0	No	Murray Hardyhead	Extrapolated
500207683	WC08	1	1	0	1	No	Murray Hardyhead	Desktop assessment
500209348	WC09	1	1	1	0	No	Murray Hardyhead	Desktop assessment
500209369	WC14	1	1	0	1	No	Murray Hardyhead	Desktop assessment
514749747	WC17	1	1	1	0	Yes	Murray Hardyhead	Site Visit
500209789	WC21a WC21b	1	2	1	1	No	Murray Hardyhead	Extrapolated
500209176	WC22	0	1	1	0	No	Murray Hardyhead	Desktop assessment
503921506	WC32	0	1	1	0	Yes	Murray Hardyhead	Site Visit
515393785	WC33	0	1	0	1	No	Murray Hardyhead	Site Visit
500207342	WC35	0	1	1	0	No	Murray Hardyhead	Desktop assessment

TopoID	Assessment ID	Stream order	Number of crossings	Existing crossings to be upgraded	New access track	Mapped key fish habitat	Indicative threatened species distribution	Assessment type
500207234	WC36	0	1	1	0	No	Murray Hardyhead	Site Visit
500207150	WC37, WC38	0	2	1	1	No	Murray Hardyhead	Desktop assessment
515390563	WC40, WC41	0	2	1	1	No	Murray Hardyhead	Site Visit
517027560	WC53	3	1	0	1	Yes	N/A	Site Visit
500837738	WC54	3	1	0	1	Yes	N/A	Site Visit
Total				**12**	**15**			

As noted above, 23 watercourse crossing locations were not subject to field verification, as such the habitat features of each site has not been determined. In the absence of field verification, a precautionary approach was adopted with each watercourse listed as key fish habitat or containing indicative threatened species distribution (as mapped) assumed to contain habitat important to fish and would require field verification prior to construction to confirm appropriate mitigation measures.

Instream works should aim to be completed in dry conditions and outside spawning/breeding periods of aquatic species, particularly threatened species. Table 5.4 outlines the spawning periods for each threatened species that has a moderate or high likelihood of occurring within the amended project footprint.

Table 5.4 Spawning periods for threatened aquatic species

Species	Spawning period	Spawning features
Silver Perch	October to March	— raise in water temperature (23°C) — flooding conditions — flowing water with high oxygen
Murray Hardyhead	September to April	— aquatic vegetation particularly Eel Grass (*Ruppia* spp) — high saline wetlands
Murray Spiny Crayfish	Mate February to May and brood 6–10 months	— cool, flowing-water habitats — clay banks — woody debris — rock cover
Flathead Galaxias	August to September	— still waters (i.e.. lake, wetlands) — aquatic vegetation particularly Ribbon Weed (*Vallisneria* spp) — course sand and mud mix substrate — temperature requirements (+10.5°C)
Trout Cod	October to November	— gravel substrate — woody debris — temperature requirements (17–18°C)
Murray Cod	September to November	— temperature requirements (+15°C) — woody debris — rocks — clay banks

As some species above, including Flathead Galaxias, Trout Cod, and Murray Cod require a specific temperature to trigger spawning events, it is important that works that may impact the temperature of the water be avoided during the spawning period. Activities that may dewater warmer water or cooler water into watercourses shall be avoided.

5.1.2.1 Crossing requirements

As mentioned above, a total of 21 new or existing access tracks would cross named watercourses and 27 would cross unnamed watercourses, of theses 23 may require an upgrade and 25 would be newly constructed. Twenty- three proposed newly constructed access tracks would occur over watercourses mapped as key fish habitat and as indicative distribution of Murray Hardyhead. The newly construct access track crossing type would need to be designed in accordance with *Why Do Fish Need to Cross the Road?* (Fairfull and Witheridge, 2003), and the *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries I, 2013). The required access track crossing types are outlined in Table 5.5. Although it is preferred that Class 1 and Class 2 watercourses have bridge structures, lesser preferred crossing can be used. Approved crossing type would depend on whether the crossing is capable of providing fish passage, maintain flow and not result in degradation to key fish habitat. As outline in the response from NSW DPIRD fisheries on the Request for advice on EIS "once waterway crossing type is determined, detailed plans of waterway crossings over key fish habitat should be provided to DPIRD fisheries for endorsement". Given proof that fish passage can be maintained, it is possible DPIRD fisheries will approve a lesser preferred crossing type.

Table 5.5 Waterway crossing type in relation to watercourse class

Classification	Minimum recommended crossing type (in order of preference)
Class one (Major key fish habitat)	1. bridge 2. arch structure 3. tunnel
Class two (Moderate key fish habitat)	1. bridge 2. arch structure 3. culvert 4. ford
Class three (Minimal key fish habitat)	1. culvert (box culverts are preferred) 2. ford
Class four (Unlikely key fish habitat)	1. culvert 2. ford 3. causeway

With the implementation of crossing types in accordance with the *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries , 2013), long-term impacts to the aquatic environments is expected to be minor. However short-term impacts associated with construction are expected at these crossings. Instream construction may result in negative impacts such as release of deleterious substances into the watercourse, create barriers to fish passage, stranding fish, removal of instream habitat features etc. During the construction period the impacts to aquatic ecology within the immediate surrounding would be considered moderate.

5.1.3 Construction compounds and temporary worker accommodation facilities

A number of construction compounds or combined temporary worker accommodation facilities would be constructed along the amended project footprint to support construction. All these compounds either interact with lower order watercourses or are adjacent to larger watercourses (Berambong creek). One site, the Cunninyeuk Road, Cunninyeuk construction compound contains an unnamed watercourse (WC21b) that is mapped as being within indicative distribution of the Murray Hardyhead species. An assessment of WC21a and WC21b was conducted and it was concluded that this unnamed watercourse did not exhibit any defined banks, native wetland vegetation or habitat features preferred by Murray Hardyhead.

As the construction compounds and combined temporary worker accommodation facilities are all located within proximity to a mapped watercourse, there is potential that indirect impacts to these watercourses may occur. Construction compounds and/or combined temporary worker accommodation would store construction equipment, construction materials, chemicals and fuels, as such there is a high risk of impacts to aquatic habitat (if not properly managed). During detailed design, detailed site planning of the construction compounds and combined temporary worker accommodation facilities would consider opportunities to avoid direct and indirect impacts to the surrounding watercourse, by including the implementation of erosion and sediment control measures, appropriate storage facilities with secondary containment for fuels and chemicals, appropriate offsite drainage and maintaining a suitable riparian zone buffer to the watercourse.

As this area of the Murray–Darling basin is largely flood plain and can exhibit strong unanticipated flows, there remains the potential for changes the watercourse, such as changes to flows that would need to be minimised where possible through the implementation of mitigation measures described in section 6.2 and *Technical paper 9 –Revised hydrology, flooding and water quality impact assessment* (WSP, 2026b).

The potential direct and indirect impacts include:

- introduction of invasive species and diseases
- removal of riparian vegetation, change in habitat structure and cover
- change in quantity and quality of food supply
- release of deleterious substances into the watercourse.
- reduction in water quality
- blockage of fish passage, during times of high flood
- change in water flows within a watercourse.

5.2 Operational assessment

Operational activities including the maintenance activities are not expected to interact with the aquatic environment and/or riparian vegetation, therefore direct impacts are not expected. Operational activities are expected to result in minimal activities occurring near watercourses, however, indirect impacts to aquatic receptors are possible. Potential indirect effects to fish and fish habitat from operational activities include:

- introduction of invasive species and disease: via vehicle during a maintenance check of transmission line structures
- change in sediment concentrations into the stream: from permanent access tracks
- change in water quality: resulting from accidental spills
- riparian vegetation die-off: as a result of tree removal or pruning as result of maintenance.

The instances of where these impacts occur during the operational phase of the amended project is unlikely.

Some access tracks and crossings constructed for construction would be retained for operational purposes, and some access tracks would be constructed for operational purposes. The potential long-term impacts to aquatic habitats is discussed in section 5.2.1.

5.2.1 Access tracks

Where required, access tracks watercourse crossings would be designed in accordance with *Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings* (Fairfull & Witheridge 2003) and *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries, 2013). Depending on the nominated crossing at each access track, long-term impacts would differ. As outlined in section 6.2 where a watercourse crossing is required, this would be undertaken to avoid the following, where possible:

- sharp bends, sections of unstable channel, or major "riffle" systems
- locating crossings over "meandering" watercourses
- works that may change the frequency or spacing of an existing pool – riffle system
- disturbances to sections of a waterway channel or its associated bank vegetation, particularly where such areas represent either a unique, endangered or highly valued section of the waterway
- the removal of essential shade trees especially on waterways.

The avoidance of the above areas would decrease the long-term impact of each crossing, however, the exact impacts at each crossing would differ depending on the quality of the surrounding aquatic habitat at each watercourse and the chosen crossing type. Overall, the crossings are not expected to have a major impact to the surrounding aquatic environment assuming all crossing are designed appropriately to accommodate high flows, are well maintained and fish passage is maintained.

5.3 Threatened species and community assessment

The extent of impact to watercourses, water quality, and hydrological processes is overall expected to be minor throughout the amended project, specifically when the appropriate management measures are implemented. The highest risk of impact to aquatic species results from the construction of new or upgraded watercourse crossings for access tracks as this would result in direct impacts to aquatic habitats including vegetation removal and instream works. It is anticipated that the likelihood of impacts to most of the threatened species could be minimised through restriction of direct impacts to the watercourses which contain mapped species habitat (excluding Murray Hardyhead habitat within the four access track crossings).

5.3.1 Environment Protection and Biodiversity Conservation Act, 1999

The amended project footprint contains mapped habitat for the EPBC (Cth) listed Silver Perch, Murray Hardyhead and Flathead Galaxias. Although Murray Cod and Trout Cod specific habitat have not been mapped, there is potential that these species could inhabit the impacted watercourses. The likelihood of occurrence assessment completed for these species determined that the Silver Perch and Murray Cod had a ‘high’ likelihood of occurrence, while the Murray Hardyhead, Flathead Galaxias and Trout Cod had a ‘moderate’ likelihood of occurrence (see Table 4.5). To assess what impacts the amended project would have on these species an EPBC Act (Cth) assessment of significance was completed with the results available in Appendix A. An EPBC Act (Cth) assessment of significance was not completed for Trout Cod, Southern Purple Spotted Gudgeon, Southern Pygmy Perch and Macquarie Perch as these species are not expected to have natural populations inhabiting the watercourses within the amended project footprint.

The assessment of significance was complete for species that had a moderate to high likelihood of occurring whereas, an assessment was not completed for species that had a low likelihood of occurring. Based on the assessment, given instream works would be temporary (access tracks) and the operational usage of the access tracks would be maintained and designed in accordance with commonwealth and state regulations and policies, and mitigation measures would be implemented to avoid or minimise indirect impacts to habitat on adjacent watercourses, it is unlikely that the amended project would have significant impact on the population of Silver Perch, Murray Hardyhead, Flathead Galaxias and Murray Cod (Table 5.6).

Table 5.6 Assessment of significance for threatened species with moderate to high likelihood of occurrence

Threatened species	Impact
Silver Perch	Moderate temporary impacts
Murray Hardyhead	Moderate temporary impacts
Flathead Galaxias	Moderate temporary impacts
Murray Cod	Moderate temporary impacts
Trout Cod	Moderate temporary impacts

It is anticipated that the likelihood of impacts to most of the threatened species could be minimised through restriction of direct impacts to the watercourses which contain mapped species habitat (excluding Murray Hardyhead habitat within the four access track crossings). The proposed mitigation and management measures outlined in section 6.2 are designed to manage impacts to fish habitat and to avoid or minimise any direct or indirect impacts to these watercourses and their habitats. It is considered unlikely that temporary impacts associated with the construction of the amended project would result in any long-term degradation of mapped key fish habitat areas. The use of existing watercourse crossings for construction and operation would be used, where possible. In the event additional watercourse crossings are required by the amended project or existing crossings require an upgrade, they would be designed in accordance with the relative guidelines and implement the appropriate mitigation measures.

5.3.2 Fisheries Management Act, 1994

The amended project footprint contains mapped habitat for the FM Act (NSW) listed Silver Perch, Murray Hardyhead, Flathead Galaxias and Murray Spiny Crayfish. Although Trout Cod specific habitat has not been mapped, there is potential that this species could inhabit the impacted watercourses. The likelihood of occurrence assessment completed for these species determined that the Silver Perch and Murray Spiny Crayfish had a 'high' likelihood of occurrence, while the Murray Hardyhead, Flathead Galaxias and Trout Cod had a 'moderate' likelihood of occurrence and Southern Purple Spotted Gudgeon, Southern Pygmy Perch and Macquarie Perch had a "low" likelihood of occurrence (see Table 4.5). To assess what impacts the amended project would have on these species a test of significance under Part 7A Division 12, Section 221ZV of the FM Act (NSW) was conducted and the outcome is available in Appendix B.

The results from the test of significance determined that although key threatening process (section 5.3.2.1) applicable to the threatened species subject to this assessment, and all of which are relevant to the amended project, it is anticipated that management and mitigation measures are sufficient to reduce or avoid impacts from the key threatening process. Anticipated impacts (direct or indirect) from the amended project to the habitat of Silver Perch, Murray Hardyhead, Murray Spiny Crayfish, Flathead Galaxias, Trout Cod, Southern Purple Spotted Gudgeon, Southern Pygmy Perch and Macquarie Perch are likely to only be temporary during the construction phase of the amended project and operational impacts would be minimised through design and landscaping initiatives where possible. Consequently, the amended project is unlikely to have a significant impact on the applicable threatened species or their habitat especially if mitigation measures in section 6.2 are implemented.

The Lower Murray River Catchment EEC is likely to occur within the amended project footprint, where the amended project footprint intersects with the Edward River and the Wakool River and their tributaries and the Murray River. The occurrence of the Lower Murray River Catchment EEC is considered to be 'high', especially in mapped key fish habitats.

Where the amended project crosses the EEC there is potential for this community to be negatively impacted. The main issues contributing to the decline of the Lower Murray Catchment EEC as a result of the amended project would include:

- degradation of the riparian (riverbank) zone
- removal of in-stream large woody debris
- introduction of diseases and invasive species
- flow modification.

However, mitigation measures outlined in section 6.2 would be implemented to minimise impacts to this EEC as determined by the results of the test of significance.

5.3.2.1 Key threatening processes

Key threatening processes are threats to aquatic habitat (particularly fish) that could either adversely impact threatened species, populations or ecological communities, or cause species, populations or ecological communities that are not threatened to become threatened. This amended project has the potential to contribute to four key threatening processes including:

- degradation of native riparian vegetation along New South Wales watercourses
- human-caused climate change
- installation and operation of instream structures and other mechanisms that alter natural flow regimes of rivers and streams
- removal of large woody debris from New South Wales rivers and streams.

However, the impacts to these key processes are expected to be limited to the construction phase of the amended project. The amended project aims to minimise the impacts to aquatic habitats within the amended project footprint. Table 5.7 outlines the amended project impacts and the management proposed to limit the impacts on the four key threatening processes.

Table 5.7 Key threatening processes relevant to the amended project (FM Act)

Key threatening process	Impact	Rehabilitation or management
Degradation of native riparian vegetation along New South Wales water courses	The amended project may require temporary degradation of native riparian during the construction period. During the construction of transmission line infrastructure the impact is anticipated to be limited to the trimming of tree canopy's to facilitate the construction and operation of the transmission line spanning each riparian area. In areas where trees must be removed, stumps would be retained and efforts to retain the understory would be made. In areas that vegetation clearance is required, hand clearing within the VRZ buffer would be conducted, with efforts being concentrated the riparian of watercourses containing key fish habitat. Full removal of riparian vegetation within the access track would be required, however this impact would be contained to the footprint of the access track. Any riparian areas subject to disturbance would be stabilised and rehabilitated, using endemic vegetation, to restore the area to pre-existing conditions as far as reasonably practicable.	Riparian areas subject to disturbance would be stabilised and rehabilitated, using endemic vegetation (where required), to restore the area to pre-existing conditions as far as reasonably practicable. Activities conducted within the riparian area will follow the requirement outlined in mitigation measure number B18 in the *Technical paper 1 – Revised Biodiversity Development Assessment Report* (WSP, 2026a).

Key threatening process	Impact	Rehabilitation or management
	The amended project is likely to generate temporary emissions during construction mostly through vehicle and equipment emissions.	Once the amended project has been built and is fully functional, it would facilitate development of renewable energy zones in the which would strive to reduce climate change impacts associated with energy production.
Installation and operation of instream structures and other mechanisms that alter natural flow regimes of rivers and streams	Access tracks proposed for the amended project include new tracks or upgrades to existing tracks, which may require new or upgraded watercourse crossings. Any new or upgraded watercourse crossing may result in impacts to the natural flow.	The amended project would prioritise utilisation of existing watercourse crossings for construction and operation, and in the event additional watercourse crossings or existing crossings need to be upgraded by the amended project, they would be designed in accordance with the *Why Do Fish Need to Cross the Road?* (Fairfull and Witheridge, 2003), and the *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries, 2013).
Removal of large woody debris from New South Wales rivers and streams	The amended project may require the removal of large woody debris to facilitate construction of watercourse crossings.	Where impacts to large woody debris cannot be avoided, lopping would be considered as the first priority for the management. Where lopping is not practicable, realignment would be considered as the next possibility, followed by relocation.

6 Management of impacts

6.1 Environmental management

This chapter describes the actions already undertaken to avoid and minimise impacts. It also describes how the amended project would be managed to reduce potential environmental impacts throughout detailed design, construction and operation.

The approach to environmental management and mitigation of potential aquatic ecology impacts for the construction of the amended project would be carried out through the development of a project specific Construction Environmental Management Plan (CEMP) for the main construction works, and the implementation of individual property management plans developed in consultation with landholders.

Operation of the amended project would be managed through Transgrid's EMS, which is accredited to ISO 14001 requirements. The EMS includes an *Environmental Assessment Framework*, which contains checklists, procedures, guidance notes and an *Environmental Handbook* (Transgrid, 2021d) to assess and manage the potential impacts of maintenance activities.

6.2 Mitigation measures

Site-specific mitigation measures have been proposed to minimise aquatic ecology impacts associated with the amended project. Mitigation measures are presented in Table 6.1. Mitigation measures that are relevant to the management of aquatic ecology impacts are included in these other technical papers:

- *Technical paper 1 – Revised Biodiversity Development Assessment Report* (WSP, 2026a)
- *Technical paper 9 – Revised hydrology, flooding and water quality impact assessment* (WSP, 2026b)
- *Technical paper 10 – Groundwater impact assessment* (WSP, 2025).

Table 6.1 Proposed mitigation measures – Aquatic ecology impact assessment

Identification no.	Issue	Mitigation measure	Timing	Location
A1	Instream works for access tracks	The following factors would be considered during the detailed design and micro siting process for waterway crossings ~~or the layout of the Cunninyeuk Road, Cunninyeuk construction compound and combined temporary worker accommodation facilities (western option 2)~~ to minimise potential impacts to aquatic environments, wherever practicable: — any existing crossings would be re-used or upgraded in preference to establishing new crossings — disturbance to waterways (bed, banks and associated riparian zones), would be avoided or minimised — the crossing design would minimise disturbance to any native vegetation, including native instream, fringing, and riparian vegetation within the access track alignment — watercourse crossings would be constructed perpendicular to the flow of the water and be positioned away from channel bends (where erosive forces are typically greatest). Preferably crossings would be located in straight stream sections with well-defined channel geometries and shallow stream gradients, in stable dry reaches — micro-siting would avoid direct and indirect (erosion or sedimentation) impacts to riverine features such as riffles and rapids and sensitive habitat features (i.e. snags, coarse woody debris, instream macrophytes) — all works within watercourse would be completed outside spawning periods of fish that inhabit the stream, which is typically spring through autumn — where instream structures are required, considerations to potential flooding and erosive effects will be made in the design and construction of the crossing.	Detailed design	New or upgraded watercourse crossings as outlined in Table 3.2

Identification no.	Issue	Mitigation measure	Timing	Location
A2	Instream works associated with watercourse crossings	Watercourse crossings would be designed, microsite and constructed in accordance with *Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings* (Fairfull & Witheridge 2003) and would include maintaining existing nominal flow velocity where possible or at less than 0.3 m/sec to avoid damage to aquatic habitats. **Watercourse crossings over key fish habitat identified in Table 3.2 and via field verification (refer to mitigation measure A3) will be designed in consultation with NSW DPIRD Fisheries** Any temporary watercourse crossings would be removed and rehabilitated at the completion of their operational use.	Detailed design, construction	New or upgraded watercourse crossings
A3	**Field verification of watercourse crossings**	**Watercourse crossing locations subject to desktop assessment only would be subject to field verification prior to construction. Field verification would include:** **— identifying the type and class of watercourse in accordance with *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries, 2013)** **— determining the presence/absence or likelihood of threated aquatic species occurring** **— confirming the need for any additional mitigation measures e.g. timing of works, or site-specific micro-siting or design requirements.**	**Detailed design**	**New or upgraded watercourse crossings as outlined in Table 3.2**
A4	Offsets for residual impacts to key fish habitat	During the detailed design and micro-siting process, potential impacts to key fish habitat would be minimised wherever practicable and where residual impacts are identified these would be quantified and offset in accordance with *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries, 2013). **Should offsets be required, an Aquatic Ecological Offset Strategy would be developed and implemented in consultation with NSW DPIRD Fisheries.** In addition, opportunities for stockpiling and supply of felled trees for key fish habitat rehabilitation or improvement works would be investigated in consultation with NSW DPIRD fisheries.	Detailed design, construction	Where key fish habitat is impacted

Identification no.	Issue	Mitigation measure	Timing	Location
A5	Instream works and bank stabilisation for watercourse crossings	Any sections of stream or watercourse banks that are impacted or modified by the amended project would be reformed or remediated to resemble the pre-work or better condition and form wherever possible or alternatively to a stable design form, as appropriate following the completion of construction work. Felled trees from the project would be used as instream habitat in the form of large woody debris where practicable.	Construction	Watercourses impacted within the amended project footprint
A7	Biosecurity risks at watercourse crossings	The following measures would be implemented to manage biosecurity risks associated with any instream work: — all vehicles, vessels and personal protective gear would be disinfected prior to entering a watercourse — equipment used during any instream works would be cleaned, drained, and dried before storing or moving it to a different body of water — all sands and sediments used as infill shall be clean and have not been previously used in another watercourse — any invasive aquatic species encountered during instream works and dewatering activities would be captured and humanely euthanised.	Construction	Watercourses within the amended project footprint
A8	Management of large woody debris	Large woody debris in the vicinity of watercourse crossings would be managed in accordance with *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries, 2013). Where impacts cannot be avoided, lopping would be considered as the first priority for the management of large woody debris. Where lopping is not practicable, realignment would be considered as the next possibility, followed by relocation.	Construction	Watercourses within the amended project footprint

Identification no.	Issue	Mitigation measure	Timing	Location
A9	Management of discharged water	Any dewatering required during works, would be carried out with consideration of native fauna at both the dewatered and downstream locations and appropriate measures would be implemented to relocate native aquatic fauna as required. Water discharges into watercourses, particularly containing spawning habitat during spawning periods (Table 5.4), would not be discharged directly into the watercourse if there is a temperature difference. Discharged water would be cooled or heated to match the ambient water temperature of the watercourse.	Construction	Watercourses within the amended project footprint
A10	Stringing of transmission lines	In watercourses that cannot support watercrafts, safety netting will be temporarily installed over watercourses that are deemed to contained Key Fish Habitat. This will stop large objects from falling within the watercourse.	Construction	Watercourses within the amended project footprint

6.3 Offset requirements

As per the *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries, 2013) habitat compensation for aquatic habitats must be completed on a minimum 2:1 basis for all key fish habitat (including type 1–3), however a greater compensation ratio may be considered if opportunities for compensation are not available in the vicinity of, or of the type of, habitat that has been lost. Any offsets would be identified and quantified during the detailed design phase in accordance with the *Policy and Guidelines for Fish Habitat Conservation and Management (Update 2013).*

Compensation to offset fisheries resource or habitat losses would be considered only after it is demonstrated that the proposed loss is unavoidable. If the amended project resulted in the loss Key Fish Habitat during the construction of access tracks and further steps cannot be undertaken to avoid or mitigate impacts, an Aquatic Ecological Offset Strategy would be developed and implemented in consultation with NSW DPIRD Fisheries.

6.3.1 Impacts to watercourses assessed and offset under the Biodiversity Conservation Act, 2016

As outlined in Table 4.6, there are 13 watercourse crossings that did not exhibit defined banks or potential spawning habitat and four crossings were associated with irrigation canals. Watercourses that did not contain aquatic vegetation or defined banks have been assessed and offset as part of the terrestrial portion of *Technical paper 1 – Revised Biodiversity Development Assessment Report* (WSP, 2026a) in accordance with the BAM. If any of these areas are impacted and offset under the BAM, the NSW DPIRD Fisheries offsetting requirements would not be required.

6.4 Residual aquatic risk assessment

This residual aquatic risk assessment was completed to identify potential risks, assess their intensity, likelihood, consequence, and ultimately their overall significance before and after the implementation of appropriate mitigation measures. The initial step is to identify a list of environmental aspects and impacts, a corresponding mitigation strategy, and risk ranking for each activity. A matrix presenting risk consequence and likelihood is outlined in Table 6.2.

The potential impacts associated with the construction activities on the amended project were evaluated and ranked based on a consideration of the consequence and likelihood of each impact, before and after the application of operational controls (i.e. mitigation measures). Table 6.3 outlines the results of this project risk assessment.

Table 6.2 Risk assessment matrix

	Consequence				
	Catastrophic	**Major**	**Moderate**	**Minor**	**Insignificant**
Almost certain	Extreme	Extreme	Extreme	High	High
Likely	Extreme	Extreme	High	High	Medium
Possible	Extreme	High	High	Medium	Low
Unlikely	High	High	Medium	Medium	Low
Rare	High	Medium	Low	Low	Low

	Consequence				
	Catastrophic	**Major**	**Moderate**	**Minor**	**Insignificant**
Consequence	**Degree of environmental impact**				
Catastrophic	Very serious environmental effects. Long term widespread effects on significant environment.				
Major	Serious environmental effects. Relatively widespread, medium-long term impacts.				
Moderate	Moderate effects. Short-medium term, widespread impacts.				
Minor	Minor effects. Short-medium term damage to small area of limited significance.				
Insignificant	Limited damage to minimal area of low significance.				
Likelihood	**Frequency of event occurring**				
Almost certain	Consequence is expected to occur in most circumstances.				
Likely	Consequence would probably occur in most circumstances.				
Possible	Consequence should occur at some time.				
Unlikely	Consequence could occur at some time.				
Rare	Consequence may only occur in exceptional circumstances.				
Category	**Risk ranking**				
	Extreme				
	High				
	Medium				
	Low				

Table 6.3 Risk ratings (before and after the implementation of mitigation measures)

Impacts from the amended project	Receptor impacted (red is impacted)					Initial impact	Proposed mitigation measures	Residual effect
	Key fish habitat	Aquatic invertebrate	Aquatic Vertebrates	Water Quality	Riparian vegetation			
Introduction of invasive species and diseases						High	— mitigation measure A7.	Low
Blockage of fish passage						Medium	— mitigation measure A1, — mitigation measure A2 — mitigation measure A4.	Low
Removal of riparian vegetation and potential riparian die-off						Medium	— mitigation measure A1 — watercourses and aquatic habitats adjacent construction sites and access tracks would be protected by exclusion zones established in accordance with mitigation measure B18.	Medium
Change in habitat structure and cover:						Medium	— mitigation measure A1 — mitigation measure A5.	Medium
Reduction in water quality within watercourses						High	— mitigation measure HF9 (erosion and sediment controls) — mitigation measure A7 — mitigation measure A9 — mitigation measure WM5 (waste management).	Medium
Change in quantity and quality of food supply						Moderate	— mitigation measure A1 — watercourses and aquatic habitats adjacent construction sites and access tracks would be protected by exclusion zones established in accordance with mitigation measure B18.	Low

Impacts from the amended project	Receptor impacted (red is impacted)					Initial impact	Proposed mitigation measures	Residual effect
	Key fish habitat	Aquatic invertebrate	Aquatic Vertebrates	Water Quality	Riparian vegetation			
Potential mortality of fish/eggs/ova						Moderate	— mitigation measure A1. — mitigation measure A9	Low
Changes to flows within watercourses						Medium	— mitigation measure A2.	Low

7 Conclusion

The amended project is a large scale project that has a footprint that crosses 98 watercourses with the majority of the project infrastructure not expected to directly impact instream habitat features. It is expect that the majority of aquatic impacts resulting from the project will be limited to access track construction and upgrades.

Of the 98 watercourses to be crossed, 35 watercourses will be crossed by access tracks. Of the 35 watercourses, 30 watercourses are mapped as intersecting Murray Hardyhead habitat, five intersecting Silver Perch habitat, two intersecting Murray Crayfish and three intersecting Flathead Galaxias. Some of the 35 watercourses were crossed multiple times as a result underwent multiple crossing assessments resulting in a total of 48 watercourse crossings that were assessed via field verification and desktop assessment.

The field assessment determined that three watercourse crossings were assessed as containing highly sensitive key fish habitat and 12 minimal sensitive key fish habitats and of these three were assessed as being moderate key fish habitat, four were assessed as being minimal key fish habitat and eight were assessed as being unlikely key fish habitat. The remainder of the watercourse crossings assessed (10) were not assigned a habitat rating as they did not meet the requirements to be considered key fish habitat (Strahler Order less than three, manmade irrigation channels not connected to key fish habitat) (Department of Primary Industries, 2013). As the remaining 23 watercourse crossings were not field verified is recommended that a conservative approach be taken, and all watercourse mapped as key fish habitat should be treated as such.

A total of eight threatened fish species and once crustacean listed under the EPBC Act (Cth) may occur in the amended study area. One species (Flathead Galaxias) is listed as critically endangered, five species (Silver Perch, Murray Hardyhead, Trout Cod, Southern Purple Spotted Gudgeon and Macquarie Perch) are listed as endangered, and three species (Murray Cod, Murray Spiny Crayfish and Southern Pygmy Perch) are listed as vulnerable under the EPBC Act (Cth) amended study area. To assess what impacts the amended project would have on these species an EPBC Act (Cth) assessment of significance was completed. The assessment determined that since constructed access tracks would be maintained and designed in accordance with commonwealth and state regulations and policies, and mitigation measures, it is unlikely that the amended project would have significant impact on the population of the EPBC (Cth) listed species.

A total of seven species is listed under the FM Act (NSW) with two (Flathead Galaxias and Murray Hardyhead) being critically endangered, three (Southern Purple Spotted Gudgeon, Southern Pygmy Perch and Macquarie Perch) being endangered and two (Silver Perch and Murray Spiny Crayfish) being vulnerable. Of these nine species, seven species are listed under both the EPBC Act (Cth) and FM Act (NSW). To assess what impacts the amended project would have on these species a test of significance under Part 7A Division 12, Section 221ZV of the FM Act (NSW) was conducted. The assessment determined that the amended project is unlikely to have a significant impact on the applicable threatened species or their habitat especially if mitigation measures in section 6.2 are implemented.

The amended study area, particularly the area around the Edward River, Wakool River and Murray River and their tributaries, is within the indicative distribution of the EEC of the Lower Murray River Catchment.

The amended project aims to limit impacts by using previously constructed access tracks, over constructing new tracks and micro siting transmission infrastructure to fall outside riparian buffers and VRZ as outlined in *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries, 2013*)* and *Controlled activities – Guidelines for riparian corridors on waterfront land* (NSW Department of Climate Change, Energy, the Environment and Water, 2025a)

Twenty-five new access tracks are located within key fish habitat or within an indicative distribution of a threatened species would need to be constructed. Additionally, six transmission line structures are located within the VRZ of a watercourse mapped as key fish habitat or in the distribution of a threatened aquatic species, however, these will not directly impact instream habitat features upon the implementation of mitigation measures. This direct interaction with watercourses and its associated riparian area would result in impacts to aquatic habitats, particularity during the construction phase of the project. It is expected that during the construction phase of the project that moderate impacts to fish habitat may occur, however, the impacts are anticipated to be temporary and managed using mitigation measures outlined in section 6.2. Operational impacts of the access tracks may result in a change in flow regime and fish passage issues; however, this is expected to be mitigated through design and ongoing maintenance.

Overall, the impacts of the amended project are expected to be moderate during the construction phase of the crossing but are not anticipated to result in significant long-term impacts to the threatened species that may inhabit the amended project footprint, nor to the EEC within the amended project footprint.

As per the *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries, 2013) habitat compensation for aquatic habitats must be completed on a minimum 2:1 basis for all key fish habitat Any offsets for the amended project would be identified and quantified during the detailed design phase in accordance with the *Policy and Guidelines for Fish Habitat Conservation and Management (Update 2013)*. Should offsets be required, an Aquatic Ecological Offset Strategy would be developed and implemented in consultation with NSW DPIRD Fisheries.

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Appendix A

Commonwealth EPBC Act assessment of significance

A1 Silver Perch *(Bidyanus bidyanus)*

The Silver Perch is listed as Endangered under the EPBC Act (Cth) and Vulnerable under the FM Act (NSW).

A1.1 Description

Silver Perch inhabit the northern and southern extent of the Murray-Darling Basin, with smaller population scattered in between. Silver Perch have been translocated to watercourses outside of the Murray-Darling Basin for recreational usage. This species inhabits free-flowing riverine environments containing clear water. Silver Perch displays no preference for instream microhabitats (i.e. woody debris, instream rocks, riparian vegetation types) and can be found in watercourses that contain limited instream habitat features in a wide temperature range (2–37°C).

Spawning occurs during the spring and summer months between October and March during the nighttime (21:00–01:00) following a rise in water temperature and an upstream migration. Hatching of the eggs occur within 36 hours within spawning.

A1.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

A summary of the relevant guidelines and policy statements available for this species is as follows:

- *Conservation advice Silver Perch (Bidyanus bidyanus)* (Department of Climate Change, Energy, the Environment and Water, 2024a)
- *NSW Silver Perch Recovery Plan* (NSW Department of Primary Industries, 2006)
- *Survey guidelines for Australia's threatened fish* (Pogonoski, 2011).

A1.3 Specific impacts

The amended project footprint contains mapped key fish habitat and mapped indicative distribution of Silver Perch. No project specific surveys for this species have been conducted, therefore a conservative approach should be taken, assuming Silver Perch inhabit these mapped watercourses. It is expected that habitat within and around waterbodies within the amended project footprint would be avoided or minimised, with the maximum impact limited to the removal or trimming of tree canopy on riverbanks to facilitate the construction and operation of the amended project where the transmission line spans riparian areas. Upgraded access tracks (and associated watercourse crossings) and construction have the potential to directly impact aquatic habitats in the form of instream works, run-off of deleterious substances, and removal of vegetation, however if appropriate mitigation measures are implemented, limited impacts to aquatic habitats would be observed.

If works are to be conducted within 40 metres of top of bank of any river, lake or wetland, project activities are to be designed and implemented in accordance with *Controlled activities – Guidelines for riparian corridors on waterfront land* (NSW Department of Climate Change, Energy, the Environment and Water, 2025a) *Controlled activities – Guidelines for watercourse crossings on waterfront land* (NSW Department of Climate Change, Energy, the Environment and Water, 2025b) *Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings* (Fairfull and Witheridge, 2003) and *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries, 2013). Additionally, the amended project expects that:

- permanent removal or degradation of aquatic habitat that would result in the loss of dispersal or spawning opportunities for an important population would not occur
- there would be no alteration of aquatic vegetation diversity or structure

- there would be no alteration to the hydrology, diversity and structure of watercourse within the amended project footprint
- there would be limited to no instream works that would result in the permanent degradation of fish habitat
- there would be no introduction of invasive fish
- there would be no introduction of deleterious substances (i.e. sedimentation, petrol, chemicals, household rubbish) into the watercourses
- there would be no net reduction in the number and/or diversity of water bodies available to an important population
- there would be no removal or alteration of available aquatic habitat corridors
- there would be no construction of physical barriers to resulting in fish passage issues.

A1.4 Is this part of an important population?

In accordance with the *Matters of National Environmental Significance - Significant Impact Guidelines 1.1* (Department of the Environment Water Heritage and the Arts 2013), the presence of an important population must be identified prior to addressing the significance impact criteria. An important population is defined in the Significant Impact Guidelines as a population that is necessary for a species' long-term survival and recovery. Under the Act, important populations are:

- likely to be key source populations either for breeding or dispersal
- likely to be necessary for maintaining genetic diversity
- at or near the limit of the species range.

This species has been divided into 17 important populations containing poorly known levels of genetic diversity, uniqueness, and connectivity amongst them. It has been determined that all populations of the Silver Perch are important for the long-term recovery, evolutionary potential, and survival of the species, therefore the population within the amended project footprint is considered to be important (Department of Climate Change, Energy, the Environment and Water, 2024a). The population within the amended project footprint includes parts of the Murray (Torrumbarry-Wenworth) and Edward sub-population. (Department of Climate Change, Energy, the Environment and Water, 2024a).

A1.5 Significant impact criteria

An action is likely to have a significant impact on a endangered species if there is a real chance or possibility that it would:

Lead to a long-term decrease in the size of an important population

Potential habitat for this species exists within the amended project footprint in the form of watercourses and the associated riparian habitat and instream features that may be impacted by the project. If the construction of new or upgraded access tracks involve instream works, the project is expected to have a moderate impact to the immediate and downstream area temporarily. Aside from the temporary instream works, long-term impacts to permanent watercourse that are likely to provide suitable spawning habitat is not anticipated and would be avoided through micrositing. To mitigate these impacts mitigation measures from section 6.2 would be implemented to protect Silver Perch habitat.

Reduce the area of occupancy of an important population

The amended project footprint contains mapped key fish habitat and mapped indicative distribution of Silver Perch. No project specific surveys for this species have been conducted, therefore a conservative approach has been taken, assuming Silver Perch inhabit these mapped watercourses. A total of eight existing crossings over named watercourses are expected to be upgraded as a result of this amended project. Temporary moderate impacts as a result of construction may occur, however the amended project is considered unlikely to have long-term impacts and significantly reduce the area of the occupancy of any important population.

Fragment an existing important population into two or more populations

Silver Perch are found in two major geographic regions including the North and South of the Murry-Darling Basin, which is separated by the Menindee weir, however, within each geographic region these fish are highly mobile, moving up to 1,200 kilometres. Due to the highly mobile nature of this species, and lack of significant permanent impacts imposed by the amended project it is unlikely this project would result in the fragmentation of this species into two or more populations.

Adversely affect habitat critical to the survival of a species

Habitat critical to the survival of a species can be defined as areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal
- for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)
- to maintain genetic diversity and long-term evolutionary development, or
- for the reintroduction of populations or recovery of the species or ecological community. (Department of the Environment Water Heritage and the Arts 2013).

No Critical Habitat as defined under section 207A of the EPBC Act has been identified or included in the Register of Critical Habitat (Department of Climate Change, Energy, the Environment and Water, 2024a). Habitat critical to the survival of the Silver Perch includes the area of known subpopulations and areas of similar habitat adjoining known subpopulations. These areas include a wide range of aquatic habitats including, alluvial meandering structure to lowland reaches to clear, rocky upland reaches. Siver Perch are a highly mobile species, with individual recorded traveling 1,200 kilometres. Their association with aquatic habitat feature is relatively unknown, therefore preferred habitat types are unknown. As the amended project is not likely to be directly impacting aquatic habitats in the long-term it is unlikely the project would affect habitat critical to the survival of this species.

Disrupt the breeding cycle of an important population

Silver Perch spawn between October and March during the nighttime following a rise in water level, temperature and an upstream migration. The eggs would remain within the bottom half of the water column where they would drift downstream and hatching within 36 hours.

If the construction of new or upgraded access tracks involves instream works, the amended project is expected to have a moderate impact to the immediate and downstream area temporarily. Mitigation measures would be implemented to avoid or minimise impacts to Silver Perch habitat. To avoid impacts to Silver Perch population works should be conducted outside of the spawning period during time of low flow.

Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

Although the amended project is expected to cross a number of watercourses containing key fish habitat, this habitat is not likely to be directly impacted by the majority of the project. Upgraded access tracks may directly interact with aquatic habitats through vegetation removal, ruff-off from road surfacing, sedimentation and instream works, however, these impacts are expected to be temporary (with moderate impacts) and mitigation measures would be implemented.

The operational usage of the upgraded access tracks may result in fish passage issues and a change in flow regime, especially if the crossings are not maintained or designed correctly as per *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries, 2013) and *Why do fish need to cross the road? Fish Passage Requirements for Waterway Crossings* (Fairfull and Witheridge, 2003). The amended project aims to design crossings in accordance with the above policies and would maintain the crossings throughout the access track's lifetime.

Overall, the amended project is considered unlikely to result in the significant modification, removal, isolation, or decreased availability or quality of habitat to the extent that the species is likely to decline. Mitigation measures would be implemented to avoid or minimise indirect and direct impacts to aquatic habitats.

Result in invasive species that are harmful to an endangered species becoming established in an endangered species' habitat

This species is adversely impacted by Common Carp (*Cyprinus carpio*) and Redfin (*Perca fluviatilis*). The Common Carp act as both direct competition for resources and contributes to the destruction of Silver Perch habitat by raising turbidity and destroying submergent macrophytes. Redfin are carriers of the Epizootic Haematopoietic Necrosis Virus which results in the high mortality of native fish. Mitigation measures would aim at controlling and preventing the introduction of exotic fish species within all watercourses in the amended project footprint.

Introduce disease that may cause the species to decline

This species is susceptible to Epizootic Haematopoietic Necrosis Virus which has been identified as the cause of population decline for this species. This virus results in necrosis of the renal haematopoietic tissue, liver spleen and pancreas and has a high mortality and transmission rate. Although the transmission of Epizootic Haematopoietic Necrosis Virus is not fully understood, it is hypothesized that that fish can be infected by bath inoculation, oral transmission may occur, and infection through the gills or skin (Center for Food Security and Public Health, 2007). To avoid transferring this virus from other watercourses, mitigation measures would be implemented as part of the project works, including wash down areas and hygiene protocols to avoid or minimise contamination and minimising the spread of disease and viruses.

Interfere substantially with the recovery of the species

Although Threatened Species Scientific Committee has not recommended that a recovery plan be required for this species, various plans outline objectives surrounding the recovery of Silver Perch. The *Conservation advice Silver Perch (Bidyanus bidyanus)* (2024) and *NSW Silver Perch Recovery Plan* (2006) outlines the following specific objectives for recovery of the Silver Perch:

- research and information collection
- habitat protection and restoration
- manage impacts of introduced species and diseases
- develop education programs around Silver Perch angling
- management of aquaculture and stocking
- establish ongoing monitoring program.

The amended project is unlikely to interfere with any of the recovery actions that have been identified to meet the specific objectives outlined above.

A1.6 Conclusion

Silver Perch are likely to occur within the amended project footprint as part of the Murray (Torrumbarry-Wenworth) and Edward sub-population, however the habitat within and around watercourses in the amended project footprint would generally be avoided. Impacts as a result of transmission line infrastructure would be limited to the removal or trimming of tree canopy on riverbanks and operation of the project where transmission lines span riparian areas. Upgraded access tracks (and associated crossings) have the potential to directly impact aquatic habitats via sedimentation, run-off and instream works, albeit this would only be temporary with the implementation of mitigation measures outlined in section 6.2.

The operational usage of the upgraded access tracks may result in fish passage issues and a change in flow regime, especially if the crossings are not maintained or designed correctly as per *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries, 2013) and *Why do fish need to cross the road? Fish Passage Requirements for Waterway Crossings* (Fairfull and Witheridge, 2003). The amended project aims to design crossings in accordance with the above policies and would maintain the crossings throughout the access track's lifetime.

Given instream works would be temporary (access tracks) and the operational usage of the access tracks would be maintained and designed in accordance with the above policies, and mitigation measures would be implemented to avoid or minimise indirect impacts to habitat on adjacent watercourses, it is unlikely that the amended project would have significant impact on the population of these species.

A2 Murray Hardyhead *(Bidyanus bidyanus)*

The Murray Hardyhead is listed as Endangered under the EPBC Act (Cth) and Critically Endangered under the FM Act (NSW).

A2.1 Description

This schooling species is endemic to the mid and lower Murray-Darling River system in south-eastern Australia. They are commonly found in open water habitats, particularly in highly saline wetlands, floodplains and lakes. During the dry season Muray Hardyhead are confined to isolated waterbodies and floodplains. Murray Hardyhead prefer occurs in open water habitats that have a silty and sandy substrate that supports aquatic plants such as *Cumbungi* species, *Juncus* species, and macrophytes including *Ruppia* species and *Potamogeton* species.

Murray Hardyhead spawn in late spring and summer where they, which they deposit their eggs on aquatic vegetation such as *Ruppia* species (Backhouse et al. 2008). Very little is known about this species.

A2.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

A summary of the relevant guidelines and policy statements available for this species is as follows:

- *National Recovery Plan for the Murray Hardyhead (Craterocephalus fluviatiles)* (Backhouse et al. 2008)
- *Approved Conservation Advice for Craterocephalus fluviatilis (Murray Hardyhead)* (Department of Sustainability, Environment, Water, Population and Communities, 2012)
- *Survey guidelines for Australia's threatened fish* (Pogonoski, 2011).

A2.3 Specific impacts

The amended project footprint contains mapped key fish habitat and mapped indicative distribution of Murray Hardyhead. No project specific surveys for this species have been conducted, therefore a conservative approach should be taken. It is expected that habitat within the amended project footprint would be avoided. Impacts related to transmission line infrastructure would be limited to the removal or trimming of tree canopy on riverbanks to facilitate the construction and operation of the project where transmission lines span riparian areas. New and upgraded access tracks (and associated crossings) have the potential to indirectly impact aquatic habitats in the form of instream works, run-off of deleterious substances, and removal of vegetation, however if appropriate mitigation measures are implemented, limited impacts to aquatic habitats would be observed. It is proposed that a Cunninyeuk construction compound (western option 2) would directly interact with an unnamed watercourse (WC21a / 21b) that is mapped as being indicative mapped habitat for Murray Hardyhead. The construction compound would store construction equipment, construction materials, chemicals and fuels therefore there is a high risk of impacts to aquatic habitat (if not properly managed), if this option is selected. A larger area that required has been assessed to allow flexibility and micro siting of the final construction compound layout, to allow for the potential to move the compound outside of the watercourse. The field survey determined that the watercourse did not contain define banks or a depression and only contained terrestrial flora as such it is likely key habitat for Murray Hardyhead.

If works are to be conducted within 50 metres of top of bank of any river, lake or wetlands project activities are to be designed and implemented in accordance with the *Controlled activities – Guidelines for riparian corridors on waterfront land* (NSW Department of Climate Change, Energy, the Environment and Water, 2025a) *Controlled activities – Guidelines for watercourse crossings on waterfront land* (NSW Department of Climate Change, Energy, the Environment and Water, 2025b), *Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings* (Fairfull and Witheridge, 2003) and *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries, 2013). Additionally, the amended project expects that:

- permanent removal or degradation of aquatic habitat that would result in the loss of dispersal or spawning opportunities for an important population would not occur
- there would be no alteration of aquatic vegetation diversity or structure
- there would be no alteration to the hydrology, diversity and structure of watercourse within the amended project footprint
- there would be limited to no instream works that would result in the permanent degradation of fish habitat
- there would be no introduction of invasive fish
- there would be no introduction of deleterious substances (i.e. sedimentation, petrol, chemicals, household rubbish) into the watercourses
- there would be no net reduction in the number and/or diversity of water bodies available to an important population
- there would be no removal or alteration of available aquatic habitat corridors
- there would be no construction of physical barriers to resulting in fish passage issues.

This species relies on flooding to disperse between different waterbodies, with that said, floodplains, specifically during high flow events, are considered habitat for Murray Hardyhead, therefore any project works located within the floodplain have the potential, albeit low, to interact with Murray Hardyhead habitat.

A2.4 Is this part of an important population?

In accordance with the *Matters of National Environmental Significance - Significant Impact Guidelines 1.1* (Department of the Environment Water Heritage and the Arts 2013), the presence of an important population must be identified prior to addressing the significance impact criteria. An important population is defined in the Significant Impact Guidelines as a population that is necessary for a species' long-term survival and recovery. Under the Act, important populations are:

- likely to be key source populations either for breeding or dispersal
- likely to be necessary for maintaining genetic diversity
- at or near the limit of the species range.

As a result of droughts and introduced fish species, the Murray Hardyhead has experienced a large population decline. As of 2012, this species was only found in only a small number of saline lakes in Victoria and South Australia, in the middle and lower reaches of the Murray River which is downstream of the VNI project.

A2.5 Significant impact criteria

An action is likely to have a significant impact on a critically endangered species if there is a real chance or possibility that it would:

Lead to a long-term decrease in the size of an important population

The known remaining populations of Murray Hardyhead do not exist within the amended project footprint, however, recent records have shown a resurgent of this species in NSW in areas surrounding Swan Hill and Mildura (on the NSW side of the border) (NSW Department of Primary Industries, 2025). The construction of new and upgraded access tracks are expected to involve instream works, which is expected to have a moderate impact to the immediate and downstream habitat area, albeit temporarily. To mitigate these impacts mitigation measures from section 6.2 would be implemented. Aside from the temporary instream works, long-term impacts to permanent watercourse that are likely to provide suitable spawning habitat.

It is proposed that a Cunninyeuk construction compound (western option 2) would directly interact with a unnamed watercourse that is mapped as being indicative mapped habitat for Murray Hardyhead. The construction compound would store construction equipment, construction materials, chemicals and fuels therefore there is a high risk of impacts to aquatic habitat (if not properly managed), if this option is selected. A larger area that required has been assessed to allow flexibility and micro siting of the final construction.

Although the amended project is expected to conduct instream works in the mapped indicative distribution of Murray Hardyhead, it is unlike this species would be impacted as no known populations inhabit the amended project footprint.

Reduce the area of occupancy of an important population

The amended project footprint contains mapped key fish habitat and mapped indicative distribution of Murray Hardyhead. The known populations are in Victoria and South Australia which are outside of the amended project footprint; however, recent records have shown a resurgent of this species in NSW (NSW Department of Primary Industries, 2025) . No project specific surveys for this species have been conducted, therefore a conservative approach should be taken, assuming Murray Hardyhead have the potential to inhabit these mapped watercourses. A total of nine named watercourses are expected to be upgraded and four are to be newly constructed as a result of this amended project. In addition one construction compound is proposed to directly interact with a unnamed watercourse that is mapped as being indicative mapped habitat for Murray Hardyhead, however, it is recommended this compound be relocated to avoid these impacts. If the compound is not relocated, this watercourse has no known population of Murray Hardyhead, therefore it is unlikely it would reduce the area of occupancy of an important population.

Moderate impacts as a result of construction may occur, however the amended project is considered unlikely to have long-term impacts and significantly reduce the area of the occupancy of any important population.

Fragment an existing important population into two or more populations

Murray Hardyhead are associated with the Murray River and its associated saline lakes and wetlands within Victoria and South Australia, however, recent records have suggested that this species has expanded into NSW. Murray Hardyhead are known to be a mobile schooling species, that has the potential to swim great distances during favourable flooding conditions. Due to the temporary impacts imposed by the amended project and the lack of known populations within the area, it is unlikely this project would result in the fragmentation of this species into two or more populations.

Adversely affect habitat critical to the survival of a species

Habitat critical to the survival of a species can be defined as areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal
- for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)
- to maintain genetic diversity and long-term evolutionary development, or
- for the reintroduction of populations or recovery of the species or ecological community (Department of the Environment Water Heritage and the Arts 2013).

No Critical Habitat as defined under section 207A of the EPBC Act has been identified or included in the Register of Critical Habitat (Department of Climate Change, Energy, the Environment and Water, 2024a). Habitat critical to the survival of this species includes the area of known populations and areas of similar habitat within the mapped indicative Murray Hardyhead range. Watercourses within this area that have elevated salinity levels, open-water structure and fringing aquatic vegetation should be treated as critical habitat for the Murray Hardyhead. As the amended project is not likely to be directly impacting aquatic habitats in the long-term it is unlikely the project would affect habitat critical to the survival of this species.

Disrupt the breeding cycle of an important population

Murray Hardyhead spawn in late spring and summer where they deposit their eggs on aquatic vegetation such as *Ruppia s*pecies (Backhouse et al. 2008).

If the construction of new or upgraded access tracks involves instream works, the amended project is expected to have a moderate impact to the immediate and downstream area temporarily. Mitigation measures would be implemented to avoid or minimise impacts to Silver Perch habitat. To avoid impacts to the Murray Hardyhead population works should be conducted outside of the spawning period during time of low flow.

Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

Although the amended project is expected to cross a number of watercourses containing key fish habitat, this habitat is not likely to be directly impacted by the majority of the project. Upgraded access tracks may directly interact with aquatic habitats through vegetation removal, ruff-off from road surfacing, sedimentation and instream works, however, these impacts are expected to be temporary (with moderate impacts) and mitigation measures would be implemented.

The operational usage of the access tracks may result in fish passage issues and a change in flow regime, especially if the crossings are not maintained or designed correctly as per *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries, 2013) and *Why do fish need to cross the road? Fish Passage Requirements for Waterway Crossings* (Fairfull and Witheridge, 2003). The amended project aims to design crossings in accordance with the above policies and would maintain the crossings throughout the access track's lifetime.

It is proposed that a Cunninyeuk construction compound (western option 2) would directly interact with a unnamed watercourse that is mapped as being indicative mapped habitat for Murray Hardyhead. The construction compound would store construction equipment, construction materials, chemicals and fuels therefore there is a high risk of impacts to aquatic habitat (if not properly managed), if this option is selected. A larger area that required has been assessed to allow flexibility and micro siting of the final construction. If the compound is not relocated, this watercourse has no known population of Murray Hardyhead, therefore it is unlikely it would reduce quality habitat for Murray Hardyhead.

Overall, the amended project is considered unlikely to result in the significant modification, removal, isolation, or decreased availability or quality of habitat to the extent that the species is likely to decline. Mitigation measures would be implemented to avoid or minimise indirect and direct impacts to aquatic habitats.

Result in invasive species that are harmful to an critically endangered species becoming established in an critically endangered species' habitat

This species is adversely impacted by common carp (*Cyprinus carpio*), goldfish (*Carrasius auratusI)*, redfin (*Perca fluviatilis)* and eastern gambusia (*Gambusia holbrooki*). This species poses a threat to Murray Hardyhead, through predation, competition, disease transmission and other effects such as causing habitat degradation, although the exact impact is unknown. Mitigation measures would aim at controlling and preventing the introduction of exotic fish species within all watercourses in the amended project footprint.

Introduce disease that may cause the species to decline

Limited information surrounding disease impact is known of this species, however it is safe to assume typical fish diseases virus, arising from virus, bacteria, fungi infections have the potential to impact this species. In addition, introduced parasites, such as the Asian fish tapeworm is predicted to have an impact on Murray Hardyhead as it has resulted in heavy mortalities on smaller fish species, however, the extent is still unknown. To avoid transferring this virus from other watercourses, mitigation measures would be implemented as part of the project works, including wash down areas and hygiene protocols to avoid or minimise contamination and minimising the spread of disease and viruses.

Interfere substantially with the recovery of the species

The *National Recovery Plan for the Murray Hardyhead (Craterocephalus fluviatiles)* (Backhouse et al. 2008) outlines the following specific objectives for recovery of the Murray Hardyhead:

- investigate and manage threats to populations and habitats
- determine population persistence and trends
- determine habitat preferences
- investigate important life history attributes
- establish and maintain the Murray Hardyhead in captivity
- establish new populations of Murray Hardyhead in the wild
- increase community awareness of Murray Hardyhead conservation.

The amended project is unlikely to interfere with any of the recovery actions that have been identified to meet the specific objectives outlined above.

A2.6 Conclusion

Murray Hardyhead may occur within the amended project footprint, especially if populations continue to re-establish in NSW within the mapped indicative distribution of this species. Favourable habitat within and around watercourses in the amended project footprint would generally be avoided, with the majority of impact being limited to the removal or trimming of tree canopy on riverbanks and operation of the project where transmission lines span riparian areas. New or upgraded access tracks (and associated crossings) have the potential to directly impact aquatic habitats via sedimentation, run-off and instream works, albeit this would only be temporary with the implementation of mitigation measures outlined in section 6.2. Although it is unlikely that Murray Hardyhead would be in the vicinity of the amended project footprint, all watercourses and floodplains in the western portion of the amended project footprint (NSW/Victorian border to the Dinawan substation) is mapped as Murray Hardyhead habitat and would need to be protected as such.

The operational usage of the access tracks may result in fish passage issues and a change in flow regime, especially if the crossings are not maintained or designed correctly as per *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries, 2013) and *Why do fish need to cross the road? Fish Passage Requirements for Waterway Crossings* (Fairfull and Witheridge, 2003). The project aims to design crossings in accordance with the above policies and would maintain the crossings throughout the access track's lifetime.

The current design of Cunninyeuk construction compound is anticipated to interact with a unnamed watercourse that is mapped as being indicative mapped habitat for Murray Hardyhead resulting in impacts to the unnamed watercourse. If the compound is not relocated, this watercourse has no known population of Murray Hardyhead, therefore it is unlikely it would result in a significant impact to this species.

Given instream works would be temporary (access tracks) and the operational usage of the access tracks would be maintained and designed in accordance with the above policies, and mitigation measures would be implemented to avoid or minimise indirect impacts to habitat on adjacent watercourses, it is unlikely that the amended project would have significant impact on the population of these species.

A3 Flathead Galaxias *(Galaxias rostratus)*

The Flathead Galaxias is listed as Critically Endangered under the EPBC Act (Cth) and Critically Endangered under the FM Act (NSW).

A3.1 Description

Flathead Galaxias inhabit the southern half of the Murray-Darling Basin system in various habitats such as billabongs, lakes, swamps and rivers, with a preference for still or slow flowing waters (Threatened Species Scientific Committee, 2015). Flathead Galaxias prefer habitats containing coarse sand or mud substrate and aquatic vegetation (NSW Department of Primary Industries, 2014).

Spawning occurs between August and September, when water temperatures rise above 10.5°C. Eggs are randomly spawned within the water column where they eventually settle onto the streambed. Eggs would hatch after nine days when the water temperature is between 9–14°C.

A3.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

A summary of the relevant guidelines and policy statements available for this species is as follows:

- *Conservation Advice Flathead Galaxias (Galaxias rostratus)* (Threatened Species Scientific Committe, 2016)
- *Survey guidelines for Australia's threatened fish* (Pogonoski, 2011).

A3.3 Specific impacts

The amended project footprint contains mapped key fish habitat and mapped indicative distribution of Flathead Galaxias. No Project specific surveys for this species have been conducted, therefore a conservative approach should be taken. It is expected that habitat within the amended project footprint would be avoided. Impacts would be limited to the removal or trimming of tree canopy on riverbanks to facilitate the construction and operation of the project where transmission lines span riparian areas. Upgraded access tracks (and associated watercourse crossings) and construction have the potential to directly impact aquatic habitats in the form of instream works, run-off of deleterious substances, and removal of vegetation, however if appropriate mitigation measures are implemented, limited impacts to aquatic habitats would be observed.

If works are to be conducted within 50 metres of top of bank of any river, lake or wetlands project activities are to be designed and implemented in accordance with the *Controlled activities – Guidelines for riparian corridors on waterfront land* (NSW Department of Climate Change, Energy, the Environment and Water, 2025a) *Controlled activities – Guidelines for watercourse crossings on waterfront land* (NSW Department of Climate Change, Energy, the Environment and Water, 2025b), *Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings* (Fairfull and Witheridge, 2003) and *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries, 2013). Additionally, the amended project expects that:

- permanent removal or degradation of aquatic habitat that would result in the loss of dispersal or spawning opportunities for an important population would not occur
- there would be no alteration of aquatic vegetation diversity or structure

- there would be no alteration to the hydrology, diversity and structure of watercourse within the amended project footprint
- there would be limited to no instream works that would result in the permanent degradation of fish habitat
- there would be no introduction of invasive fish
- there would be no introduction of deleterious substances (i.e. sedimentation, petrol, chemicals, household rubbish) into the watercourses
- there would be no net reduction in the number and/or diversity of water bodies available to an important population
- there would be no removal or alteration of available aquatic habitat corridors
- there would be no construction of physical barriers to resulting in fish passage issues.

A3.4 Is this part of an important population?

In accordance with the *Matters of National Environmental Significance - Significant Impact Guidelines 1.1* (Department of the Environment Water Heritage and the Arts 2013), the presence of an important population must be identified prior to addressing the significance impact criteria. An important population is defined in the Significant Impact Guidelines as a population that is necessary for a species' long-term survival and recovery. Under the Act, important populations are:

- likely to be key source populations either for breeding or dispersal
- likely to be necessary for maintaining genetic diversity
- at or near the limit of the species range.

This species has not been recorded within the Murrumbidgee catchment for over 20-years, and only seven individuals were found in the Mid-Murray catchment in 2011/2012 during a survey, located over 200 kilometres from the amended project footprint therefore it is unlikely that any individual would inhabit this reach of the project.

A3.5 Significant impact criteria

An action is likely to have a significant impact on a critically endangered species if there is a real chance or possibility that it would:

Lead to a long-term decrease in the size of an important population

This species has experienced a significant population decline, specifically in NSW, where it is presumed to be locally extinct from the Lachlan, Murrumbidgee and lower Murray River catchments. Although recent surveys have not identified the presence of Flathead Galaxias within the Murrumbidgee, it is still mapped as habitat that could be used by this species.

If the construction of new or upgraded access tracks involves instream works, the project is expected to have a moderate impact to the immediate and downstream area temporarily. Aside from the temporary instream works, long-term impacts to permanent watercourse that are likely to provide suitable spawning habitat. To mitigate these impacts mitigation measures from Chapter 6 would be implemented to protect Flathead Galaxias habitat.

Reduce the area of occupancy of an important population

This species has experienced a huge population decline, specifically in NSW, where it is presumed to be locally extinct from the Lachlan, Murrumbidgee and lower Murray River catchments, despite this, mapped key fish habitat and mapped indicative distribution of Flathead Galaxias exists within the amended project footprint (Threatened Species Scientific Committe, 2016). A conservative approach for this assessment was taken and assumed Flathead Galaxias could potentially utilize this mapped habitat.

A total of seven named watercourses are expected to be upgraded as a result of this project. Temporary moderate impacts as a result of construction may occur, however the amended project is considered unlikely to have long-term impacts and significantly reduce the area of the occupancy of any important population.

Fragment an existing important population into two or more populations

The amended project is not expected to result in permanent impacts that would result in fish passage issues therefore it is unlikely this project would result in the fragmentation of this species into two or more populations.

Adversely affect habitat critical to the survival of a species

Habitat critical to the survival of a species can be defined as areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal
- for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)
- to maintain genetic diversity and long-term evolutionary development, or
- for the reintroduction of populations or recovery of the species or ecological community. (Department of the Environment Water Heritage and the Arts 2013).

No Critical Habitat as defined under section 207A of the EPBC Act has been identified or included in the Register of Critical Habitat (Department of Climate Change, Energy, the Environment and Water, 2024a). Habitat critical to the survival of the Flathead Galaxias includes the area of known populations and areas of similar habitat adjoining known populations that contains its habitat preference (i.e. slow-flowing watercourses, wetlands and lakes). The amended project is unlikely to directly impact aquatic habitats in the long-term therefore it is unlikely the project would affect habitat critical to the survival of this species.

Disrupt the breeding cycle of an important population

Flathead Galaxias spawn between August and September, when water temperatures rise above 10.5°C. Eggs are randomly spawned within the water column where they eventually settle onto the streambed, where the eggs would hatch after nine days when the water temperature is between 9–14°C.

Aside from new and upgraded access tracks (and associated crossings), the amended project would not impact instream aquatic features that would impact the breeding cycle of this species. If instream works is required for new and upgraded access tracks (and associated crossings), it is recommended that works be conducted outside of the spawning period during time of low flow. Mitigation measures would be implemented to avoid or minimise indirect impacts to retained habitat within the amended project footprint.

Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

Although the amended project is expected to cross a number of watercourses containing key fish habitat for the Flathead Galaxias, this habitat is not likely to be directly impacted by the majority of the project. Upgraded access tracks may directly interact with aquatic habitats through vegetation removal, ruff-off from road surfacing, sedimentation and instream works, however, these impacts are expected to be temporary (with moderate impacts) and mitigation measures would be implemented.

The operational usage of the upgraded access tracks may result in fish passage issues and a change in flow regime, especially if the crossings are not maintained or designed correctly as per *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries, 2013) and *Why do fish need to cross the road? Fish Passage Requirements for Waterway Crossings* (Fairfull and Witheridge, 2003). The amended project aims to design crossings in accordance with the above policies and would maintain the crossings throughout the access track's lifetime.

Overall, the amended project is considered unlikely to result in the significant modification, removal, isolation, or decreased availability or quality of habitat to the extent that the species is likely to decline. Mitigation measures would be implemented to avoid or minimise indirect and direct impacts to aquatic habitats.

Result in invasive species that are harmful to a critically endangered species becoming established in a critically endangered species' habitat

This species is adversely impacted by Common Carp (*Cyprinus carpio*), Gambusia (*Gambusia holbrooki*), Salmonids, and Redfin (*Perca fluviatilis)*. These species pose a threat to Flathead Galaxias, through predation, competition, disease transmission and other effects such as causing habitat degradation, although the exact impact is unknown. Mitigation measures would aim at controlling and preventing the introduction of exotic fish species within all watercourses in the amended project footprint.

Introduce disease that may cause the species to decline

Limited information surrounding disease impact is known of this species, however it is safe to assume typical fish diseases arising from viruses (specifically epizootic haematopoietic necrosis virus), bacteria, fungi infections have the potential to impact this species. To avoid transferring this virus from other watercourses, mitigation measures would be implemented as part of the project works, including wash down areas and hygiene protocols to avoid or minimise contamination and minimising the spread of disease and viruses.

Interfere substantially with the recovery of the species

Although Threatened Species Scientific Committee has not recommended that a recovery plan be required for this species, the *Conservation Advice Flathead Galaxias (Galaxias rostratus)* outlines the following conservation objectives for recovery of the Flathead Galaxias:

- implement Conservation and Management Actions
  - control alien species
  - implement a seeding program of native aquatic plants
  - explore the use of larger environmental flow events
  - implement management and engineering solutions to physical barriers
- implement monitoring programs
- outline information and research priorities.

The amended project is unlikely to interfere with any of the recovery actions that have been identified to meet the specific objectives outlined above.

A3.6 Conclusion

Flathead Galaxias may occur within the amended project footprint, especially in lower section near the Murray River. Favourable habitat within and around watercourses in the amended project footprint would generally be avoided, with the maximum impact limited to the removal or trimming of tree canopy on riverbanks and operation of the project where transmission lines span riparian areas. Upgraded access tracks (and associated crossings) have the potential to directly impact aquatic habitats via sedimentation, run-off and instream works, albeit this would only be temporary with the implementation of mitigation measures outlined in section 6.2.

The operational usage of the access tracks may result in fish passage issues and a change in flow regime, especially if the crossings are not maintained or designed correctly as per *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries, 2013) and *Why do fish need to cross the road? Fish Passage Requirements for Waterway Crossings* (Fairfull and Witheridge, 2003). The amended project aims to design crossings in accordance with the above policies and would maintain the crossings throughout the access track's lifetime.

Given instream works would be temporary (access tracks) and the operational usage of the access tracks would be maintained and designed in accordance with the above policies, and mitigation measures would be implemented to avoid or minimise indirect impacts to habitat on adjacent watercourses, it is unlikely that the amended project would have significant impact on the population of these species.

A4 Murray Cod *(Maccullochella peelii)*

The Murray Cod is listed as Vulnerable under the EPBC Act.

A4.1 Description

Murray Cod inhabit all major catchments within the Murray-Darling Basin that contain warmer waters. Murray Cod prefer habitats that contain large rocks, woody debris and undercut banks with overhanging vegetation (Fishes of Australia, 2025). Murray Cod are a slow – maturing, long living fish, known to live 48 years, however, historical catches of this fish suggest they can live up to 114 years.

In the southern portion of the Murray-Darling Basin, Murray Cod spawn during the spring or early summer. This species is known to complete a spawning migration where they move 200 kilometres upstream to spawn in water temperatures are between around 19–20 °C. The males would establish the spawning site by cleaning rocks with their pectoral fins weeks prior to the female arriving at the spawning location. Once the females arrive, they would lay 10,000–110,000 eggs which would hatch within five–13 day, during this time they are protected by the male fish. The male would continue to protect the larvae for a week following the hatching (Department of Climate Change, Energy, the Environment and Water, 2024).

A4.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

A summary of the relevant guidelines and policy statements available for this species is as follows:

- *Conservation advice for Maccullochella peelii (Murray Cod))* (Department of Climate Change, Energy, the Environment and Water, 2024)
- *National Recovery Plan for the Murray Cod (Maccullochella peelii peelii)* (NSW Department of Primary Industries, 2006; National Murray Cod Recovery Team, 2010)
- *Survey guidelines for Australia's threatened fish* (Pogonoski, 2011).

A4.3 Specific impacts

The amended project is located within the known extent Murray Cod. No project specific surveys for this species have been conducted, therefore a conservative approach should be taken. It is expected that habitat within and around waterbodies within the amended project footprint would be avoided or minimised, with the maximum impact limited to the removal or trimming of tree canopy on riverbanks to facilitate the construction and operation of the project where the transmission line spans riparian areas. Upgraded access tracks (and associated watercourse crossings) and construction have the potential to directly impact aquatic habitats in the form of instream works, run-off of deleterious substances, and removal of vegetation, however if appropriate mitigation measures are implemented, limited impacts to aquatic habitats would be observed.

If works are to be conducted within 50 metres of top of bank of any river, lake or wetlands project activities are to be designed and implemented in accordance with the Controlled activities – Guidelines for riparian corridors on waterfront land (NSW Department of Climate Change, Energy, the Environment and Water, 2025a) Controlled activities – Guidelines for watercourse crossings on waterfront land (NSW Department of Climate Change, Energy, the Environment and Water, 2025b), Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (Fairfull and Witheridge, 2003) and Policy and guidelines for fish habitat conservation and management (Update 2013) (Department of Primary Industries, 2013). Additionally, the amended project expects that:

- permanent removal or degradation of aquatic habitat that would result in the loss of dispersal or spawning opportunities for an important population would not occur
- there would be no alteration of aquatic vegetation diversity or structure
- there would be no alteration to the hydrology, diversity and structure of watercourse within the amended project footprint
- there would be limited to no instream works that would result in the permanent degradation of fish habitat
- there would be no introduction of invasive fish
- there would be no introduction of deleterious substances (i.e. sedimentation, petrol, chemicals, household rubbish) into the watercourses
- there would be no net reduction in the number and/or diversity of water bodies available to an important population
- there would be no removal or alteration of available aquatic habitat corridors
- there would be no construction of physical barriers to resulting in fish passage issues.

A4.4 Is this part of an important population?

In accordance with the *Matters of National Environmental Significance - Significant Impact Guidelines 1.1* (Department of the Environment Water Heritage and the Arts 2013), the presence of an important population must be identified prior to addressing the significance impact criteria. An important population is defined in the Significant Impact Guidelines as a population that is necessary for a species' long-term survival and recovery. Under the Act, important populations are:

- likely to be key source populations either for breeding or dispersal
- likely to be necessary for maintaining genetic diversity
- at or near the limit of the species range.

This species has been divided into various populations within each state including nine in Victoria, seven in NSW, five in South Australian three in Queensland and one in the ACT. It has been determined that all populations of the Murray Cod are important for the long-term recovery, evolutionary potential, and survival of the species, therefore the population within the amended project footprint is considered to be important (Department of Climate Change, Energy, the Environment and Water, 2024). The population within the amended project footprint includes the Murray River main channel including minor tributaries and anabranches, downstream, of Yarrawonga population and the Edward River including most major tributaries population.

A4.5 Significant impact criteria

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it would:

Lead to a long-term decrease in the size of an important population

Potential habitat for the species exists within the amended project footprint in the form of watercourses and the associated riparian habitat and instream that may be impacted by the project. If the construction of new and upgraded access tracks involve instream works, the project is expected to have a moderate impact to the immediate and downstream area temporarily. Aside from the temporary instream works, long-term impacts to permanent watercourse that are likely to provide suitable spawning habitat. To mitigate these impacts mitigation measures from section 6.2 would be implemented to protect Murray Cod habitat.

Reduce the area of occupancy of an important population

The amended project footprint contains mapped key fish habitat that has the potential to be utilised by Murray Cod. No project specific surveys for this species have been conducted, therefore a conservative approach should be taken, assuming Murray Cod inhabit these watercourses. The majority of aquatic habitats within the amended project footprint, would be avoided, with the maximum impact limited to the removal or trimming of tree canopy on watercourse banks to facilitate the construction and operation of the project where the transmission line spans riparian areas. During the construction of new and upgraded access tracks, temporary moderate impacts as a result of construction may occur, however the project is considered unlikely to have long-term impacts and significantly reduce the area of the occupancy of any important population.

Fragment an existing important population into two or more populations

This species is found throughout the Murray-Darling Basin and has a wide distribution, however, there are a number of sub-populations including seven in NSW. This amended project would overlap with the following populations:

- Murray River main channel including minor tributaries and anabranches, downstream, of Yarrawonga
- Edward River including most major tributaries.

Although the amended project would overlap with important populations, the project is unlikely to result in the fragmentation of this species into two or more populations as it would not result in the creation of fish passage barriers as crossings would be maintained or designed as per *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries, 2013) and *Why do fish need to cross the road? Fish Passage Requirements for Waterway Crossings* (Fairfull and Witheridge, 2003)..

Adversely affect habitat critical to the survival of a species

Habitat critical to the survival of a species can be defined as areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal
- for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)
- to maintain genetic diversity and long-term evolutionary development, or
- for the reintroduction of populations or recovery of the species or ecological community (Department of the Environment Water Heritage and the Arts 2013).

No Critical Habitat as defined under section 207A of the EPBC Act has been identified or included in the Register of Critical Habitat (Department of Climate Change, Energy, the Environment and Water, 2024a). Habitat critical to the survival of the Murray Cod include flowing water with high water velocity that contains structural features such as rocks, woody debris and instream and riparian vegetation. As the amended project is not likely to be directly impacting aquatic habitats in the long-term it is unlikely the project would affect habitat critical to the survival of this species.

Disrupt the breeding cycle of an important population

Murray Cod spawn during the spring or early summer in the southern portion of the Murray-Darling Basin. This species is known to complete a spawning migration where they move 200 kilometres upstream to spawn in water temperatures are between around 19–20 °C. The males would establish the spawning site by cleaning rocks with their pectoral fins. Once the females arrive, they would lay 10,000–110,000 eggs which would hatch within five to 13 days, during this time they are protected by the male fish. The male would continue to protect the larvae for a week following the hatching.

Aside from access track crossings (new or upgraded), the amended project would not impact instream aquatic features that would impact the breeding cycle of this species. If instream works is required for new and upgraded access tracks (and associated crossings), it is recommended that works be conducted outside of the spawning period during time of low flow. Mitigation measures would be implemented to avoid or minimise indirect impacts to retained habitat within the amended project footprint.

Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

Although the amended project is expected to cross a number of watercourses containing key fish habitat, this habitat is not likely to be directly impacted by the majority of the project. Upgraded access tracks may directly interact with aquatic habitats through vegetation removal, ruff-off from road surfacing, sedimentation and instream works, however, these impacts are expected to be temporary (with moderate impacts) and mitigation measures would be implemented.

The operational usage of the access tracks may result in fish passage issues and a change in flow regime, especially if the crossings are not maintained or designed correctly as per *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries, 2013) and *Why do fish need to cross the road? Fish Passage Requirements for Waterway Crossings* (Fairfull and Witheridge, 2003). The amended project aims to design crossings in accordance with the above policies and would maintain the crossings throughout the access track's lifetime.

Overall, the amended project is considered unlikely to result in the significant modification, removal, isolation, or decreased availability or quality of habitat to the extent that the species is likely to decline. Mitigation measures would be implemented to avoid or minimise indirect and direct impacts to aquatic habitats.

Result in invasive species that are harmful to an vulnerable species becoming established in an vulnerable species' habitat

This species is adversely impacted by Common Carp (*Cyprinus carpio*) and Redfin (*Perca fluviatilis*). The Common Carp act as both direct competition for resources and contributes to the destruction of Murray Cod habitat by raising turbidity, destroying submergent macrophytes, reducing planktons and aquatic invertebrates, and proliferating algal blooms. Redfin are ravenous predators which consume the eggs and larva of Murray Cod. In addition, redfin are carriers of the Epizootic Haematopoietic Necrosis Virus which results in the high mortality of native fish. Mitigation measures would aim at controlling and preventing the introduction of exotic fish species within all watercourses in the amended project footprint.

Introduce disease that may cause the species to decline

This species is susceptible to Epizootic Haematopoietic Necrosis Virus which has been identified as the cause of population decline for this species. This virus results in necrosis of the renal haematopoietic tissue, liver spleen and pancreas and has a high mortality and transmission rate. Murray Cod are also susceptible to parasites (Asian fish tapeworm, anchor worms) protozoans (*Chilodonella* spp., *Icthyophthirius* spp., or *Trichodina* spp.) and fungus (*Aphanomyces invadans, Myxobacteria, Saprolegnia and Achlya, Epistylis, Goussia lomi*). Project activities may contribute to the spread of diseases through the utilization of equipment and PPE used at different project sites that may have come in contact with these diseases, parasites and fungus. To avoid transferring this virus from other watercourses, mitigation measures would be implemented as part of the project works, including wash down areas and hygiene protocols to avoid or minimise contamination and minimising the spread of disease and viruses.

Interfere substantially with the recovery of the species

The *National Recovery Plan for the Murray Cod (Maccullochella peelii peelii)* (2010) outlines the following specific objectives for recovery of the Murray Cod:

- determine the distribution, structure and dynamics of Murray Cod populations
- manage river flows to enhance recruitment to Murray Cod populations
- evaluate the risks of threats and benefits of recovery options on Murray Cod populations for each management unit
- determine the habitat requirements of Murray Cod life stages and populations
- manage the recreational fishery for Murray Cod in a sustainable manner while recognising the social, economic and recreational value of the fishery
- encourage community ownership for Murray Cod conservation
- manage Recovery Plan implementation.

The amended project is unlikely to interfere with any of the recovery actions that have been identified to meet the specific objectives outlined above.

A4.6 Conclusion

Murray Cod are likely to occur within the amended project footprint. Habitat within and around watercourses in the amended project footprint would generally be avoided, with the majority of the project impacts being limited to the removal or trimming of tree canopy on riverbanks and operation of the project where transmission lines span riparian areas. New or upgraded access tracks (and associated crossings) have the potential to directly impact aquatic habitats via sedimentation, run-off and instream works, albeit this would only be temporary with the implementation of mitigation measures outlined in section 6.2.

The operational use of the access tracks may result in fish passage issues and a change in flow regime, especially if the crossings are not maintained or designed correctly as per *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries, 2013) and *Why do fish need to cross the road? Fish Passage Requirements for Waterway Crossings* (Fairfull and Witheridge, 2003). The amended project aims to design crossings in accordance with the above policies and would maintain the crossings throughout the access track's lifetime.

Given instream works would be temporary (access tracks) and the operational use of the access tracks would be maintained and designed in accordance with the above policies, and mitigation measures would be implemented to avoid or minimise indirect impacts to habitat on adjacent watercourses, it is unlikely that the amended project would have significant impact on the population of these species.

A5 Trout Cod *(Maccullochella macquariensis)*

The Trout Cod is listed as Endangered under the EPBC Act.

A5.1 Description

The Trout Cod is endemic to the southern Murray–Darling Basin. Historically Trout Cod were found in Bathurst, Bredbo, Tharwa, Gundagai, Wagga Wagga, Narrandera, Yanco, Hay, Thornton, Yarrawonga, Swan Hill, and Purnong, indicating that trout cod were historically present over a large portion of the Murry-Darling Basin. However, the population has drastically declined with the only known wild-origin subpopulation occurring in the Murray River, immediately downstream of Lake Mulwala, between Yarrawonga and Tocumwal. However, translocation programs and large conservation stocking have since resulted in subpopulations being re-established in the middle and upper Murrumbidgee, upper Murray, lower Goulburn and lower Ovens rivers, Cataract Dam and Lake Sambell (Department of Climate Change, Energy, the Environment and Water, 2024)

Trout cod have a lifespan of 20–25 years and become sexually mature at 3–5 years. Trout cod form pairs and spawn around October and November when the water temperatures reach above 15°C. Once they lay their eggs males will provide parental care to eggs until the larvae hatches and the larvae will actively disperse in the water column (Department of Climate Change, Energy, the Environment and Water, 2024).

Trout cod prefer habitats containing fast flowing waters (0.49 m/s) , deep pools (>2.8 m), steep banks and copious amounts of woody debris (>68% cover) (Department of Climate Change, Energy, the Environment and Water, 2024). They prefer cooler waters and are typically found in upper reaches of watercourses.

A5.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

A summary of the relevant guidelines and policy statements available for this species is as follows:

- *Department of Climate Change, Energy, the Environment and Water (2024). Conservation Advice for Maccullochella macquariensis (trout cod)* (Department of Climate Change, Energy, the Environment and Water, 2024)
- *National Recovery Plan for Trout Cod Maccullochella macquariensis* (Trout Cod Recovery Team, 2008)
- *Trout cod (Maccullochella macquariensis) recovery plan* (Department of Primary Industries, 2006)
- *Survey guidelines for Australia's threatened fish* (Pogonoski, 2011).

A5.3 Specific impacts

The amended project is located within the known extent Trout Cod, however, it is outside the know natural population of Trout Cod. No project specific surveys for this species have been conducted, therefore a conservative approach should be taken. It is expected that habitats within and around waterbodies within the amended project footprint would be avoided or minimised, with the maximum impact limited to the removal or trimming of tree canopy on riverbanks to facilitate the construction and operation of the project where the transmission line spans riparian areas. Upgraded access tracks (and associated watercourse crossings) and construction have the potential to directly impact aquatic habitats in the form of instream works, run-off of deleterious substances, and removal of vegetation, however if appropriate mitigation measures are implemented, limited impacts to aquatic habitats would be observed.

If works are to be conducted within 50 metres of top of bank of any river, lake or wetlands project activities are to be designed and implemented in accordance with the Controlled activities – Guidelines for riparian corridors on waterfront land (NSW Department of Climate Change, Energy, the Environment and Water, 2025a) Controlled activities – Guidelines for watercourse crossings on waterfront land (NSW Department of Climate Change, Energy, the Environment and Water, 2025b), Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (Fairfull and Witheridge, 2003) and Policy and guidelines for fish habitat conservation and management (Update 2013) (Department of Primary Industries, 2013). Additionally, the amended project expects that:

- permanent removal or degradation of aquatic habitat that would result in the loss of dispersal or spawning opportunities for an important population would not occur
- there would be no alteration of aquatic vegetation diversity or structure
- there would be no alteration to the hydrology, diversity and structure of watercourse within the amended project footprint
- there would be limited to no instream works that would result in the permanent degradation of fish habitat
- there would be no introduction of invasive fish
- there would be no introduction of deleterious substances (i.e. sedimentation, petrol, chemicals, household rubbish) into the watercourses
- there would be no net reduction in the number and/or diversity of water bodies available to an important population
- there would be no removal or alteration of available aquatic habitat corridors
- there would be no construction of physical barriers to resulting in fish passage issues.

A5.4 Is this part of an important population?

In accordance with the *Matters of National Environmental Significance - Significant Impact Guidelines 1.1* (Department of the Environment Water Heritage and the Arts 2013), the presence of an important population must be identified prior to addressing the significance impact criteria. An important population is defined in the Significant Impact Guidelines as a population that is necessary for a species' long-term survival and recovery. Under the Act, important populations are:

- likely to be key source populations either for breeding or dispersal
- likely to be necessary for maintaining genetic diversity
- at or near the limit of the species range.

All known natural populations and newly discovered populations of Trout Cod are important populations considering the low number of known populations. All breeding populations including stocked populations are also important populations considering that they contribute to genetic diversity and dispersal of this species. Known populations include but are not limited to:

- Murray River, downstream of Lake Mulwalla, Yarrawonga to Barmah
- Murrumbidgee River from Narrandera to Gundagai
- Upper Murrumbidgee River (above Burrinjuck Dam to Cooma)
- Seven Creeks Polly McQuinns Weir to Galls Gap Road
- Ovens River system
- Goulburn River downstream from Lake Nagambie.

A5.5 Significant impact criteria

An action is likely to have a significant impact on a Endangered species if there is a real chance or possibility that it would:

Lead to a long-term decrease in the size of an important population

Potential habitat for the species exists within the amended project footprint in the form of watercourses and the associated riparian habitat and instream features that may be impacted by the project. If the construction of new and upgraded access tracks involve instream works, the project is expected to have a moderate impact to the immediate and downstream area temporarily. Aside from the temporary instream works, long-term impacts to permanent watercourse that are likely to provide suitable spawning habitat. To mitigate these impacts mitigation measures from section 6.2 would be implemented to protect Trout Cod habitat.

Reduce the area of occupancy of an important population

The amended project footprint contains mapped key fish habitat that has the potential to be utilised by Trout Cod. No project specific surveys for this species have been conducted; therefore a conservative approach should be taken, assuming Trout Cod has potential to inhabit these watercourses. The majority of aquatic habitats within the amended project footprint, would be avoided, with the maximum impact limited to the removal or trimming of tree canopy on watercourse banks to facilitate the construction and operation of the project where the transmission line spans riparian areas. During the construction of new and upgraded access tracks, temporary moderate impacts as a result of construction may occur, however the project is considered unlikely to have long-term impacts and significantly reduce the area of the occupancy of any important population.

Fragment an existing important population into two or more populations

The amended project would overlap with important populations, the project is unlikely to result in the fragmentation of this species into two or more populations as it would not result in the creation of fish passage barriers as crossings would be maintained or designed as per *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries, 2013) and *Why do fish need to cross the road? Fish Passage Requirements for Waterway Crossings* (Fairfull and Witheridge, 2003)..

Adversely affect habitat critical to the survival of a species

Habitat critical to the survival of a species can be defined as areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal
- for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)
- to maintain genetic diversity and long-term evolutionary development, or
- for the reintroduction of populations or recovery of the species or ecological community (Department of the Environment Water Heritage and the Arts 2013).

No Critical Habitat as defined under section 207A of the EPBC Act has been identified or included in the Register of Critical Habitat (Department of Climate Change, Energy, the Environment and Water, 2024a). Habitat critical to the survival of the Trout Cod include flowing water with high water velocity that contains structural features such as steep banks, woody debris and deeps pools. As the amended project is not likely to be directly impacting aquatic habitats in the long-term it is unlikely the project would affect habitat critical to the survival of this species.

Disrupt the breeding cycle of an important population

Trout cod form pairs and spawn around October and November when the water temperatures reach above 15°C but below 22°C. Females will lay 1200–11,000 adhesive eggs that will hatch in 5–10 days. Trout Cod are known to provide parental care to eggs. Once the larvae are 6-9 mm they will actively disperse in the water column. Trout Cod are temperature sensitive during spawning and impacts early larvae survival with the greater abundance of larvae being at greatest at 20°C, and oocyte reabsorption at temperatures > 21°C.

Aside from access track crossings (new or upgraded), the amended project would not impact instream aquatic features that would impact the breeding cycle of this species. If instream works is required for new and upgraded access tracks (and associated crossings), it is recommended that works be conducted outside of the spawning period during time of low flow. Mitigation measures would be implemented to avoid or minimise indirect impacts to retained habitat within the amended project footprint.

Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

Although the amended project is expected to cross a number of watercourses containing key fish habitat, this habitat is not likely to be directly impacted by the majority of the project. Upgraded access tracks may directly interact with aquatic habitats through vegetation removal, ruff-off from road surfacing, sedimentation and instream works, however, these impacts are expected to be temporary (with moderate impacts) and mitigation measures would be implemented.

The operational usage of the access tracks may result in fish passage issues and a change in flow regime, especially if the crossings are not maintained or designed correctly as per *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries, 2013) and *Why do fish need to cross the road? Fish Passage Requirements for Waterway Crossings* (Fairfull and Witheridge, 2003). The amended project aims to design crossings in accordance with the above policies and would maintain the crossings throughout the access track's lifetime.

Overall, the amended project is considered unlikely to result in the significant modification, removal, isolation, or decreased availability or quality of habitat to the extent that the species is likely to decline. Mitigation measures would be implemented to avoid or minimise indirect and direct impacts to aquatic habitats.

Result in invasive species that are harmful to an endangered species becoming established in an endangered species' habitat

This species is adversely impacted by Common Carp (*Cyprinus carpio*) Brown Trout (*Salmo trutta*), Rainbow Trout (*Oncorhynchus mykiss),* Goldfish (Carassius auratus), Eastern Gambusia (*Gambusia holbrooki*) and Oriental Weatherloach (*Misgurnus anguillicaudatus*) and Redfin (*Perca fluviatilis*). The Common Carp act as both direct competition for resources and contributes to the destruction of Trout Cod habitat by raising turbidity, destroying submergent macrophytes, reducing planktons and aquatic invertebrates, and proliferating algal blooms. Redfin and Brown Trout are predators of Trout Cod. In addition, redfin are carriers of the Epizootic Haematopoietic Necrosis Virus which results in the high mortality of native fish. Mitigation measures would aim at controlling and preventing the introduction of exotic fish species within all watercourses in the amended project footprint.

Introduce disease that may cause the species to decline

This species is susceptible to Epizootic Haematopoietic Necrosis Virus which has been identified as the cause of population decline for this species. This virus results in necrosis of the renal haematopoietic tissue, liver spleen and pancreas and has a high mortality and transmission rate. Trout Cod are also susceptible to parasites (*Bothriocephalus acheilognathi*, anchor worms, *Lernaea cyprinacea*). Project activities may contribute to the spread of diseases through the utilization of equipment and PPE used at different project sites that may have come in contact with these diseases and parasites. To avoid transferring this virus from other watercourses, mitigation measures would be implemented as part of the project works, including wash down areas and hygiene protocols to avoid or minimise contamination and minimising the spread of disease and viruses.

Interfere substantially with the recovery of the species

The *National Recovery Plan for the Trout Cod (Maccullochella macquariensis)* (2008) outlines the following specific objectives for recovery of the Trout Cod:

- investigate key aspects of biology and ecology, especially as they relate to conservation management and identification of
- identify and map habitat critical to survival
- investigate and control threatening processes
- manage Murray River, Seven Creek, Oven River, Murrumbidgee River, and Cotter River populations population to ensure its continued sustainability
- breed Trout Cod for reintroduction to establish new populations
- undertake reintroductions to establish new populations in the wild
- encourage community awareness and support for Trout Cod conservation
- trial development of a recreational fishery for stocked Trout Cod in Victoria
- manage Recovery Plan implementation.

The amended project is unlikely to interfere with any of the recovery actions that have been identified to meet the specific objectives outlined above.

A5.6 Conclusion

Trout Cod are likely to occur within the amended project footprint. Habitat within and around watercourses in the amended project footprint would generally be avoided, with the majority of the project impacts being limited to the removal or trimming of tree canopy on riverbanks and operation of the project where transmission lines span riparian areas. New or upgraded access tracks (and associated crossings) have the potential to directly impact aquatic habitats via sedimentation, run-off and instream works, albeit this would only be temporary with the implementation of mitigation measures outlined in section 6.2.

The operational use of the access tracks may result in fish passage issues and a change in flow regime, especially if the crossings are not maintained or designed correctly as per *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries, 2013) and *Why do fish need to cross the road? Fish Passage Requirements for Waterway Crossings* (Fairfull and Witheridge, 2003). The amended project aims to design crossings in accordance with the above policies and would maintain the crossings throughout the access track's lifetime.

Given instream works would be temporary (access tracks) and the operational use of the access tracks would be maintained and designed in accordance with the above policies, and mitigation measures would be implemented to avoid or minimise indirect impacts to habitat on adjacent watercourses, it is unlikely that the amended project would have significant impact on the population of these species.

A6 Murray Spiny Crayfish *(Euastacus armatus)*

The Murray Spiny Crayfish is listed as Vulnerable under the EPBC Act.

A6.1 Description

The Murray Spiny Crayfish have distinct white or creamy coloured claws and sharp white spines on the abdominal segments, cephalothorax and chelae (Threatened Species Scientific Committee, 2025). This species is endemic to dynamic flowing waters of the southern Murray-Darling Basin. Historically this species inhabited 12,500 km of waterway including extending main channel and tributaries of the Murray, Murrumbidgee, Mitta Mitta, Kiewa, Ovens and Goulburn rivers, existing from the upper reaches from over 800 m above sea level, downstream to at least Murray Bridge in South Australia Currently this species randomly distributed in the Murray River between Euston and Tocumwal in NSW and Victorian tributaries such as the Edward, Kiewa and Goulburn rivers. This specie is known to inhabit small ranges as outline in a 1986 study that saw over three years 87% of tagged individuals were recaptured within a few metres of their initial capture sites (Threatened Species Scientific Committee, 2025).

Murray crayfish are slow growing with half of females reaching sexual maturity at 5 years with the remaining after 10 years, however, some individuals do not reach functional reproductivity until they reach a larger size, regardless of age. Murray crayfish are winter brooders with mating occurring in late summer and brooding occurring for 6 to 10 months. Mating is triggered by the decline in water temperatures (12–15°C), to ensure a synchronised mating cycle (Threatened Species Scientific Committee, 2025). Fecundity for Murray cray fish differ extensively amongst females from (150 eggs to 2000 eggs)

This species prefers cool-flowing waters with clay banks for burrowing. Murray Spiny Crayfish are found in a wide sort of habitat types but prefers habitat containing deeper water, and stream beds dominated by boulders and gravel, with a high cover of overhanging riparian vegetation (Threatened Species Scientific Committee, 2025).

A6.2 Relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan

A summary of the relevant guidelines and policy statements available for this species is as follows:

- *Conservation Advice Euastacus armatus Murray crayfish* (Threatened Species Scientific Committee, 2025).

A6.3 Specific impacts

The amended project is located within the known extent Murray Spiny Crayfish. No project specific surveys for this species have been conducted, therefore a conservative approach should be taken. It is expected that habitat within and around waterbodies within the amended project footprint would be avoided or minimised, with the maximum impact limited to the removal or trimming of tree canopy on riverbanks to facilitate the construction and operation of the project where the transmission line spans riparian areas. Upgraded access tracks (and associated watercourse crossings) and construction have the potential to directly impact aquatic habitats in the form of instream works, run-off of deleterious substances, and removal of vegetation, however if appropriate mitigation measures are implemented, limited impacts to aquatic habitats would be observed.

If works are to be conducted within 50 metres of top of bank of any river, lake or wetlands project activities are to be designed and implemented in accordance with the Controlled activities – Guidelines for riparian corridors on waterfront land (NSW Department of Climate Change, Energy, the Environment and Water, 2025a) Controlled activities – Guidelines for watercourse crossings on waterfront land (NSW Department of Climate Change, Energy, the Environment and Water, 2025b), Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (Fairfull and Witheridge, 2003) and Policy and guidelines for fish habitat conservation and management (Update 2013) (Department of Primary Industries, 2013). Additionally, the amended project expects that:

- permanent removal or degradation of aquatic habitat that would result in the loss of dispersal or spawning opportunities for an important population would not occur
- there would be no alteration of aquatic vegetation diversity or structure
- there would be no alteration to the hydrology, diversity and structure of watercourse within the amended project footprint
- there would be limited to no instream works that would result in the permanent degradation of fish habitat
- there would be no introduction of invasive fish
- there would be no introduction of deleterious substances (i.e. sedimentation, petrol, chemicals, household rubbish) into the watercourses
- there would be no net reduction in the number and/or diversity of water bodies available to an important population
- there would be no removal or alteration of available aquatic habitat corridors
- there would be no construction of physical barriers to resulting in fish passage issues.

A6.4 Is this part of an important population?

In accordance with the *Matters of National Environmental Significance - Significant Impact Guidelines 1.1* (Department of the Environment Water Heritage and the Arts 2013), the presence of an important population must be identified prior to addressing the significance impact criteria. An important population is defined in the Significant Impact Guidelines as a population that is necessary for a species' long-term survival and recovery. Under the Act, important populations are:

- likely to be key source populations either for breeding or dispersal
- likely to be necessary for maintaining genetic diversity
- at or near the limit of the species range.

Currently this species randomly distributed in the Murray River between Euston and Tocumwal in NSW and Victorian tributaries such as the Edward, Kiewa and Goulburn rivers. There does not appear to be a distinct population in the immediate area of the amended project, the closest record individual was in Yanco Creek As such it is not expected this project will impact an important Murray Spiny Crayfish. Population.

A6.5 Significant impact criteria

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it would:

Lead to a long-term decrease in the size of an important population

Potential habitat for the species exists within the amended project footprint in the form of watercourses and the associated riparian habitat and instream that may be impacted by the project. If the construction of new and upgraded access tracks involve instream works, the project is expected to have a moderate impact to the immediate and downstream area temporarily. Aside from the temporary instream works, long-term impacts to permanent watercourse that are likely to provide suitable spawning habitat. To mitigate these impacts mitigation measures from section 6.2 would be implemented to protect Murray Spiny Crayfish habitat.

Reduce the area of occupancy of an important population

The amended project footprint contains mapped key fish habitat that has the potential to be utilised by Murray Spiny Crayfish. No project specific surveys for this species have been conducted, therefore a conservative approach should be taken, assuming Murray Cod inhabit these watercourses. The majority of aquatic habitats within the amended project footprint, would be avoided, with the maximum impact limited to the removal or trimming of tree canopy on watercourse banks to facilitate the construction and operation of the project where the transmission line spans riparian areas. During the construction of new and upgraded access tracks, temporary moderate impacts as a result of construction may occur, however the project is considered unlikely to have long-term impacts and significantly reduce the area of the occupancy of any important population.

Fragment an existing important population into two or more populations

Although the amended project would overlap with various potential populations of this species, the project is unlikely to result in the fragmentation of this species into two or more populations as it would not result in the creation of connectivity barriers as crossings would be maintained or designed as per *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries, 2013) and *Why do fish need to cross the road? Fish Passage Requirements for Waterway Crossings* (Fairfull and Witheridge, 2003)..

Adversely affect habitat critical to the survival of a species

Habitat critical to the survival of a species can be defined as areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal
- for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)
- to maintain genetic diversity and long-term evolutionary development, or
- for the reintroduction of populations or recovery of the species or ecological community (Department of the Environment Water Heritage and the Arts 2013).

No Critical Habitat as defined under section 207A of the EPBC Act has been identified or included in the Register of Critical Habitat (Department of Climate Change, Energy, the Environment and Water, 2024a). Habitat critical to the survival of the Murray Spiny Crayfish include flowing water with high water velocity that contains structural features such as deeper water, and stream beds dominated by boulders and gravel, with a high cover of overhanging riparian vegetation. As the amended project is not likely to be directly impacting aquatic habitats in the long-term it is unlikely the project would affect habitat critical to the survival of this species.

Disrupt the breeding cycle of an important population

Murray crayfish are slow growing with half of females reaching sexual maturity at 5 years with the remaining after 10 years, however, some individuals do not reach functional reproductivity until they reach a larger size, regardless of age. Murray crayfish are winter brooders with mating occurring in late summer and brooding occurring for 6 to 10 months. Mating is triggered by the decline in water temperatures (12–15°C), to ensure a synchronised mating cycle. Fecundity for Murray cray fish differ extensively amongst females from (150 eggs to 2000 eggs). Females care for the eggs under their abdomen for the 20-week incubation period and once hatched the offspring remains in the mother's care for a further month.

Aside from access track crossings (new or upgraded), the amended project would not impact instream aquatic features that would impact the breeding cycle of this species. If instream works is required for new and upgraded access tracks (and associated crossings), it is recommended that works be conducted outside of the spawning period during time of low flow. Mitigation measures would be implemented to avoid or minimise indirect impacts to retained habitat within the amended project footprint.

Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

Although the amended project is expected to cross a number of watercourses containing key fish habitat, this habitat is not likely to be directly impacted by the majority of the project. Upgraded access tracks may directly interact with aquatic habitats through vegetation removal, ruff-off from road surfacing, sedimentation and instream works, however, these impacts are expected to be temporary (with moderate impacts) and mitigation measures would be implemented.

The operational usage of the access tracks may result in connectivity issues and a change in flow regime, especially if the crossings are not maintained or designed correctly as per *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries, 2013) and *Why do fish need to cross the road? Fish Passage Requirements for Waterway Crossings* (Fairfull and Witheridge, 2003). The amended project aims to design crossings in accordance with the above policies and would maintain the crossings throughout the access track's lifetime.

Overall, the amended project is considered unlikely to result in the significant modification, removal, isolation, or decreased availability or quality of habitat to the extent that the species is likely to decline. Mitigation measures would be implemented to avoid or minimise indirect and direct impacts to aquatic habitats.

Result in invasive species that are harmful to a vulnerable species becoming established in an vulnerable species' habitat

This species is adversely impacted by Common Carp (*Cyprinus carpio*), Redfin Perch (*Perca fluviatilis*) Brown Trout (*Salmo trutta*) and Rainbow Trout (*Oncorhynchus mykiss*). These predatory fish feed on small crayfish, and can restricting feeding movements of larger crayfish Whilst no concrete reports, it is highly likely that predation by these species impacts the mortality rates of juvenile It is not expected that the amended project will result in the introduction or increase of these species

Introduce disease that may cause the species to decline

This species is susceptible to *Aphanomyces astaci* which is a contagious pathogenic oomycete that has a 100% mortality rate to susceptible species. Although the impact of this disease on Australian Crayfish is not readily known, there has been a few documentation of showing the mortality risks to Australian crayfish To avoid transferring this virus from other watercourses, mitigation measures would be implemented as part of the project works, including wash down areas and hygiene protocols to avoid or minimise contamination and minimising the spread of disease and viruses.

Interfere substantially with the recovery of the species

Although Threatened Species Scientific Committee has not yet published a that a recovery plan be required for this species, the *Conservation Advice Euastacus armatus Murray crayfish* outlines the following recovery actions:

- understand impacts that climate change (increased temperature) and severe weather impacts, including hypoxic blackwater and fire impacts have on this species
- investigate feasibility and species-level benefits and, if appropriate, plan and establish facilities for potential ex situ short-term, active conservation intervention(s)
- evaluate harvest pressure
- manage habitat loss and disturbance
- understand and implement biosecurity measures for disease impacts
- implementation of invasive species control programs
- understand survey and monitoring priorities
- conduct more research on obtain more information on this species.

The amended project is unlikely to interfere with any of the recovery actions that have been identified to meet the specific objectives outlined above.

A6.6 Conclusion

Murray Spiny Crayfish are likely to occur within the amended project footprint. Habitat within and around watercourses in the amended project footprint would generally be avoided, with the majority of the project impacts being limited to the removal or trimming of tree canopy on riverbanks and operation of the project where transmission lines span riparian areas. New or upgraded access tracks (and associated crossings) have the potential to directly impact aquatic habitats via sedimentation, run-off and instream works, albeit this would only be temporary with the implementation of mitigation measures outlined in section 6.2.

The operational use of the access tracks may result in connectivity issues and a change in flow regime, especially if the crossings are not maintained or designed correctly as per *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries, 2013) and *Why do fish need to cross the road? Fish Passage Requirements for Waterway Crossings* (Fairfull and Witheridge, 2003). The amended project aims to design crossings in accordance with the above policies and would maintain the crossings throughout the access track's lifetime.

Given instream works would be temporary (access tracks) and the operational use of the access tracks would be maintained and designed in accordance with the above policies, and mitigation measures would be implemented to avoid or minimise indirect impacts to habitat on adjacent watercourses, it is unlikely that the amended project would have significant impact on the population of these species.

Appendix B

Test of significance

Test of significance for Silver Perch, Murray Hardyhead, Murray Spiny Crayfish, Flathead Galaxias, Trout Cod, Macquarie Perch and the aquatic ecological community in the natural drainage system of the lower Murray River (as per Part 7A Division 12, Section 221ZV of the Fisheries Management Act 1994)

The following is to be considered for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats.

a ***In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.***

Watercourse crossings would be designed in accordance with *Controlled activities – Guidelines for riparian corridors on waterfront land* (NSW Department of Climate Change, Energy, the Environment and Water, 2025a) *Controlled activities – Guidelines for watercourse crossings on waterfront land* (NSW Department of Climate Change, Energy, the Environment and Water, 2025b), *Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings* (Fairfull and Witheridge, 2003) and *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries, 2013). Overall, the extent of impact to waterbodies, water quality and hydrological processes is expected to be minimal throughout the project, subsequently reducing the risk of impacts on threatened species within the indicative disturbance footprint. Breeding and other lifecycle activities are expected to continue.

Threats to each individual threatened aquatic species that was identified in the desktop assessment is listed below. It is not expected that the amended project would not exasperate or add to these threats.

Silver Perch

The amended project is not likely to have an adverse effect on the life cycle of the Silver Perch such that a viable local population of the species is likely to be placed at risk of extinction.

Silver Perch is threatened by:

- altered flow regime
- barriers to fish movement
- increased frequency and severity of droughts
- invasive species
  - competition with common carp
  - predation by redfin
  - disease (Epizootic Haematopoietic Necrosis Virus (EHNV))
- parasitic invertebrates
- recreational fishing
- collection for breeding.

The amended project would have a limited impact on these factors that threaten Silver Perch.

Murray Hardyhead

The amended project is not likely to have an adverse effect on the life cycle of the Murray Hardyhead such that a viable local population of the species is likely to be placed at risk of extinction.

The Murray Hardyhead is threatened due to:

- increasing salinity of preferred habitat resulting in connectivity issues
- river regulation and changes in flow regimes
- irrigation run-off
- high nutrient levels
- acid sulphate soils
- environmental contamination
- sedimentation
- barriers to fish movement
- predation, competition and habitat degradation as a result of invasive species.

The amended project would have a limited impact on these factors that threaten Murray Hardyhead.

Murray Spiny Crayfish

The amended project is not likely to have an adverse effect on the life cycle of the Murray Spiny Crayfish such that a viable local population of the species is likely to be placed at risk of extinction.

Murray Spiny Crayfish is threatened by:

- habitat modification
- sedimentation
- river regulation may result in reduced overall flows, alter water temperatures
- agricultural pesticides
- historic commercial and current illegal fishing activities
- low dissolved oxygen concentrations such as those experienced in blackwater events
- predation, competition and habitat degradation as a result of invasive species.

The amended project would have a limited impact on these factors that threaten Murray Spiny Crayfish.

Flathead Galaxias

The amended project is not likely to have an adverse effect on the life cycle of the Flathead Galaxias such that a viable local population of the species is likely to be placed at risk of extinction.

Flathead Galaxias is threatened by:

- river regulation and changes in flow regimes resulting in connectivity issues
- habitat degradation as a result of agricultural practices
- environmental contamination resulting in the decrease in water quality
- barriers to fish movement
- predation, competition and habitat degradation as a result of invasive species.

The amended project would have a limited impact on these factors that threaten Flathead Galaxias.

Trout Cod

The amended project is not likely to have an adverse effect on the life cycle of the Trout Cod such that a viable local population of the species is likely to be placed at risk of extinction.

Trout Cod is threatened by:

- removal of Large Woody Debris
- river regulation and changes in flow regimes resulting in connectivity issues
- barriers to fish movement
- loss to irrigation
- poor water quality
- sedimentation
- thermal pollution
- predation, competition and habitat degradation as a result of invasive species
- recreation fishing
- low genetic diversity and hybridisation
- disease (*Chilodonella* species, *Ichthyophthirius* species, *Myxosoma* species and *Trichodina* species).

The amended project would have a limited impact on these factors that threaten Trout Cod.

Macquarie Perch

The project is not likely to have an adverse effect on the life cycle of the Macquarie Perch such that a viable local population of the species is likely to be placed at risk of extinction.

- human activity-induced sedimentation increases
- competition and predation by invasive fish species including carp, gambusia, redfin perch and trout
- barriers to fish movement
- river regulation and changes in flow regimes resulting in connectivity issues.

The amended project would have a limited impact on these factors that threaten Macquarie Perch.

Southern Purple Spotted Gudgeon

The project is not likely to have an adverse effect on the life cycle of the Southern Purple Spotted Gudgeon such that a viable local population of the species is likely to be placed at risk of extinction.

- habitat modification/ degradation due to human activities
- harvested for aquarium trade
- altered flow regime
- river regulation and changes in flow regimes resulting in connectivity issues
- predation, competition and habitat degradation as a result of invasive species

The amended project would have a limited impact on these factors that threaten Southern Purple Spotted Gudgeon.

Southern Pygmy Perch

The project is not likely to have an adverse effect on the life cycle of the Southern Pygmy Perch such that a viable local population of the species is likely to be placed at risk of extinction.

- removal of riparian and aquatic vegetation
- loss of connectivity between watercourses
- sedimentation
- change to flow regimes
- predation, competition and habitat degradation as a result of invasive species
- climate change (drought, extreme rain events)

The amended project would have a limited impact on these factors that threaten Southern Pygmy Perch.

Overall, the majority of the amended project would have a limited impact on these factors that threaten these species listed above. During the construction of the transmission line, the main impact to occur in an area of key fish habitat would be the removal or trimming of tree canopy on the creek banks to facilitate the construction and operation of the project where transmission lines span each riparian area. All trunk bases and understorey would be retained in-situ adjoining the watercourse banks. All potential indirect impacts associated with erosion and sedimentation impacts would be managed and monitored to ensure that these do not impact the riparian areas.

The addition of new access track crossings and upgrading existing track crossings have the potential to result in sedimentation, release of contamination and potential instream works. Twenty new and upgraded access tracks cross key fish habitat within the indicative distribution of the Silver Perch, Flathead Galaxias Murray Hardyhead, Southern Purple Spotted Gudgeon, Southern Pygmy Perch and Murray Spiny Crayfish potentially impacting habitat that may be utilised by this species. To avoid this, these works would require mitigation measures, that when implemented would decrease the impacts this works would have on the aquatic habitat. Work in the lower order watercourses may dry up and work may be able to occur, limiting the impact of construction to these species. All instream and riparian works are expected to be temporary and not result in long-term impacts.

If work were to occur during periods of flow and the appropriate mitigation measures outlined in section 6.2 with need to be strictly adhered to. The most likely impacts during construction would be impacts to water quality and temporary removal of instream habitat features that would leave moderate impacts on the immediate aquatic habitat, however this would be temporary in nature.

The operational usage of the access tracks may result in fish passage issues and a change in flow regime, especially if the crossings are not maintained or designed correctly as per *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries, 2013) and *Why do fish need to cross the road? Fish Passage Requirements for Waterway Crossings* (Fairfull and Witheridge, 2003). The amended project aims to design crossings in accordance with the above policies and would maintain the crossings throughout the access track's lifetime.

Overall, each riparian area would continue to function as it currently performs. It is considered unlikely that temporary impacts would result in any long-term degradation of mapped key fish habitat areas.

b ***in the case of an endangered population, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,***

The amended project footprint overlaps with three known populations of Silver Perch (part of the Murray (Torrumbarry – Wenworth) and Edward sub-population) and one known population of Murray Cod (Murray River main channel including minor tributaries and anabranches, downstream, of Yarrawonga population and the Edward River including most major tributaries). The population of both these species is widespread and are unlikely to be impacted by the project as the only instream works in key fish habitat proposed is the construction of access tracks. These access tracks would be designed and constructed as per the *Policy and guidelines for fish habitat conservation and management (Update 2013)*

(Department of Primary Industries, 2013) and *Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings* (Fairfull and Witheridge, 2003) to ensure crossing types erected can allow for fish passage. Post construction, the surrounding riparian area and instream habitat would be rehabilitated to ensure aquatic habitat is maintained and the access tracks would be maintained to ensure fish passage is maintained.

c ***In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity***

i ***is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or***

ii ***is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.***

The amended project footprint, particularly the areas surrounding the Murray River, Edwards River and Wakool River and all their associated tributaries, contains an identified endangered ecological community (EEC) named the aquatic ecological community in the natural drainage system of the lower Murray River. As the amended project footprint overlaps with mapped key fish habitat within this EEC, it is assumed the mapped key fish habitat contains the EEC.

Overall, the majority of the amended project would have a limited impact the EEC, as the majority of the project impacts would result from the construction of the transmission line. During the construction of transmission line infrastructure, the main impact to occur in an area of key fish habitat that would contain the EEC would be the removal or trimming of tree canopy on the creek banks to facilitate the construction and operation of the project where transmission lines span each riparian area. Activities within riparian zones (within the definition of the *Controlled activities – Guidelines for riparian corridors on waterfront land* (NSW Department of Climate Change, Energy, the Environment and Water, 2025b)) would be managed to minimise impacts to native riparian understorey vegetation and aquatic environments. Riparian areas subject to disturbance would be progressively stabilised and rehabilitated to minimise impacts to aquatic habitats, water quality from sedimentation and erosion. Where possible vegetation clearing would be limited to the tree stratum only, with trunk bases being retained in-situ.

The amended project would require the construction of new access track crossings and upgrading existing track crossings which has the potential to result in sedimentation, release of contamination and potential instream works. To avoid this, these works would require mitigation measures, that when implemented would decrease the impacts this works would have on the aquatic habitat. Instream works are anticipated to avoid spawning times (spring – autumn) and work would be completed during dry periods, if possible. All instream and riparian works are expected to be temporary and not result in long-term impacts.

If work were to occur during periods of flow, appropriate mitigation measures outlined in Chapter 6 would need to be strictly adhered to. The most likely impacts during construction would be impacts to water quality and temporary removal of instream habitat features that would leave moderate impacts on the immediate aquatic habitat, however this would be temporary in nature. Overall, each riparian area would continue to function as it currently performs. It is considered unlikely that temporary impacts would result in any long-term degradation and result in an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

d ***In relation to the habitat of a threatened species, population or ecological community:***

i ***the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and***

ii ***whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and***

iii ***the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality.***

Degradation of riparian zones can impact both aquatic and terrestrial biodiversity that are affiliated with the habitat. Consequently, in the event of any disturbance to riparian areas, only the vegetation of the tree-stratum would be cleared (with tree trunks to be retained) in order to protect the understory in such areas. Any riparian areas subject to disturbance

would be stabilised and rehabilitated, using endemic vegetation, to restore the area to pre-existing conditions as far as reasonably practicable. As the amended project is unlikely to impact core riparian zones, no direct impacts are expected to occur to these aquatic values of reliant threatened aquatic species.

Habitat connectivity would be maintained through avoiding the construction of additional watercourse barriers within watercourses. The proposed development`s preference would be to utilise existing watercourse crossings (i.e., bridges, culverts) for construction and operation, to avoid the need to construct additional watercourse barriers, however, it is understood that new crossings are required. These new crossings would be designed in accordance with the *Controlled activities – Guidelines for riparian corridors on waterfront land* (NSW Department of Climate Change, Energy, the Environment and Water, 2025a), *Controlled activities – Guidelines for watercourse crossings on waterfront land* (NSW Department of Climate Change, Energy, the Environment and Water, 2025b), *Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings* (Fairfull and Witheridge, 2003) and *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries, 2013), to ensure impacts on fish passage and habitat connectivity are minimised. New and upgraded access tracks (and associated crossings) may result in a direct impact to aquatic habitats in the form of sedimentation, chemical (bitumen) run-off and if required, instream works. To limit impacts the aquatic environment, mitigation measures would require implementation to decrease the impacts. Instream works are anticipated to avoid spawning times (spring – autumn) and work be completed during dry periods. All instream and riparian works are expected to be temporary and not result in long-term impacts. As these works are only expected to have a moderate impact to the immediate area of works temporarily, it is unlikely this would impact these species.

e ***Whether the proposed development or activity is likely to have an adverse effect on any critical habitat (either directly or indirectly.***

No Critical Habitat as defined under section 207A of the EPBC Act has been identified or included in the Register of Critical Habitat (Department of Climate Change, Energy, the Environment and Water, 2024a) for Silver Perch, Flathead Galaxias Murray Hardyhead, Southern Purple Spotted Gudgeon, Southern Pygmy Perch and Murray Spiny Crayfish within the amended project footprint.

f ***Whether the proposed development or activity is consistent with a Priorities Action Statement.***

The NSW Department of Primary Industries Priorities Action Statements outline recovery actions for these species are listed in Table B.1.

Table B.1 Priorities action statements for each species

Species	Priorities action statement
Silver Perch	— advice to consent and determining authorities — collate and review existing information — community and stakeholder liaison, awareness and education — compliance/enforcement — enhance, modify or implement NRM planning processes to minimize adverse impacts on threatened species — habitat rehabilitation — pest eradication and control — research/monitoring — stocking/translocation — survey/mapping.
Murray Hardyhead	
Macquarie Perch	
Murray Spiny Crayfish	
Southern Purple Spotted Gudgeon	
Southern Pygmy Perch	

Species	Priorities action statement
Flathead Galaxias	— advice to consent and determining authorities — collate and review existing information — community and stakeholder liaison, awareness and education — compliance/enforcement — enhance, modify or implement NRM planning processes to minimize adverse impacts on threatened species — habitat rehabilitation — habitat protection — pest eradication and control — research/monitoring — stocking/translocation — survey/mapping.
Silver Perch	— advice to consent and determining authorities — community and stakeholder liaison, awareness and education — compliance/enforcement — enhance, modify or implement NRM planning processes to minimize adverse impacts on threatened species — habitat rehabilitation — research/monitoring — survey/mapping.
Trout Cod	— community and stakeholder liaison, awareness and education — compliance/enforcement — enhance, modify or implement NRM planning processes to minimize adverse impacts on threatened species — habitat rehabilitation — research/monitoring — stocking/translocation.

The amended project does not interfere with any of the recovery actions for these species.

g ***Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.***

A Key Threatening Process (KTP) is a process that threatens, or may have the capability to threaten, the survival or evolutionary development of species, population, or ecological community. KTPs specific to native fish and marine vegetation are listed under the FM Act (NSW). Of the eight listed KTPs under Schedule 6 of the FM Act (NSW), five are applicable to this assessment (Table B.2).

Table B.2 Key threatening processes relevant to the project (FM Act (NSW))

Key threatening process	Relevance to the amended project
Degradation of native riparian vegetation along NSW watercourses	Yes. The amended project may require temporary degradation of native riparian during the construction period. During the construction of transmission line infrastructure the impact is anticipated to be limited to the trimming of tree canopy's to facilitate the construction and operation of the transmission line spanning each riparian area. In areas where trees must be removed, stumps would be retained and efforts to retain the understory would be made. In areas that vegetation clearance is required, hand clearing within the VRZ buffer would be conducted, with efforts being concentrated the riparian of watercourses containing key fish habitat.. Full removal of riparian vegetation within the access track would be required, however this impact would be contained to the footprint of the access track. Any riparian areas subject to disturbance would be stabilised and rehabilitated, using endemic vegetation, to restore the area to pre-existing conditions as far as reasonably practicable.
Human-caused climate change	Yes. The amended project is likely to generate temporary emissions during construction. However, the purpose of the project is to facilitate development of renewable energy zones in the which would strive to reduce climate change impacts associated with energy production.
Installation and operation of instream structures and other mechanisms that alter natural flow regimes of rivers and streams	Yes. The amended project would prioritise utilisation of existing watercourse crossings for construction and operation, and in the event additional watercourse crossings are required by the project, they would be designed in accordance with the *Controlled activities – Guidelines for riparian corridors on waterfront land* (NSW Department of Climate Change, Energy, the Environment and Water, 2025a), *Controlled activities – Guidelines for watercourse crossings on waterfront land* (NSW Department of Climate Change, Energy, the Environment and Water, 2025b), *Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings* (Fairfull and Witheridge, 2003) and *Policy and guidelines for fish habitat conservation and management (Update 2013)* (Department of Primary Industries, 2013).
Removal of large woody debris from NSW rivers and streams	Yes. The amended project may require the removal of large woody debris to facilitate construction of watercourse crossings, if required. Preference would be to utilise existing watercourse crossings.

Conclusion

While there are several KTPs applicable to the threatened species subject to this assessment, and all of which are relevant to the amended project, it is anticipated that management and mitigation measures are sufficient to reduce or avoid impacts from the KTPs. Anticipated impacts (direct or indirect) from the amended project to the habitat of Silver Perch, Flathead Galaxias Murray Hardyhead, Southern Purple Spotted Gudgeon, Southern Pygmy Perch and Murray Spiny Crayfish are likely to only be temporary during the construction phase of the amended project and operational impacts would be minimised through design and landscaping initiatives where possible. Consequently, the amended project is unlikely to have a significant impact on the applicable threatened species or their habitat especially if mitigation measures in section 6.2 are implemented.

Appendix C

Habitat assessment results

C1 Characteristics of surveyed reaches or watercourse crossings

The below watercourses assessments that have been included for watercourse that had defined banks and channels. Watercourses that do not exhibit these features are described in Table 4.6 and Table 4.7.

Habitat features		WC17			
		Downstream 500 meters	Downstream 100 meters	Central	Upstream 50–100 meters
Channel morphology		Meandering	Meandering	Meandering	Meandering
Stream type		Intermittent	Ephemeral, Flood Plain	Ephemeral, Flood Plain	Ephemeral, Flood Plain
Flow condition		No water	No water	No water	No water
Gradient °		one	1.5	two	two
Connectivity		The current “access track” cuts off passage and downstream confluence is steep and highly vegetated.			
Wetted width (meters)		5.9	No water	No water	No water
Bank width (meters)		70.5	21.6	20.7	14.5
In stream vegetation cover (per cent)		one	30 – some are not hydrophilic flora	–	–
Canopy cover (per cent)		one	two	two	15
Water depth (meters)		0.1	–	–	–
Water quality	**Turbidity (NTU)**	Too shallow to measure	No water	No water	No water
	pH				
	DO (per cent)				
	DO (mg/L)				
	Temperature (°C)				
	Conductivity (uS/cm)				

Habitat features		WC17			
		Downstream 500 meters	Downstream 100 meters	Central	Upstream 50–100 meters
Substrate (per cent)	**Clay <0.002 millimetres**	–	5	20	20
	Silt 0.002-0.02 millimetres	100	80	70	70
	Sand 0.02-2 millimetres	–	10	10	10
	Granule 2-4 millimetres	–	5.0	–	–
	Pebble 4-64 millimetres	–	–	–	–
	Cobble 64-256 millimetres	–	–	–	–
	Boulder >256 millimetres	–	–	–	–
	Organic	–	–	–	–
Debris	**Composition**	Woody Debris: 10 per cent	Woody Debris: five per cent	Woody Debris: 10 per cent	Woody Debris: 15 per cent
	Total cover (per cent)	10	five	10	15
Left bank	**Veg cover (per cent)**	80	15	20	20
	Substrate	Loam (70 per cent) Clay (20 per cent) Sand (10 per cent)	Loam (70 per cent) Clay (20 per cent) Sand (10 per cent)	Loam (70 per cent) Clay (20 per cent) Sand (10 per cent)	Loam (70 per cent) Clay (20 per cent) Sand (10 per cent)
	Height (meters)	3.0	1.3	1.1	1.1
	Morphology	Moderately sloped	Gently sloped	Gently sloped	Gently sloped
	Stability	Stable	Stable	Stable, but undefined	Stable, but undefined

Habitat features		WC17			
		Downstream 500 meters	**Downstream 100 meters**	**Central**	**Upstream 50–100 meters**
Right bank	**Veg cover (per cent)**	85	15	20	15
	Substrate	Loam (70 per cent) Clay (20 per cent) Sand (10 per cent)	Loam (70 per cent) Clay (20 per cent) Sand (10 per cent)	Loam (70 per cent) Clay (20 per cent) Sand (10 per cent)	Loam (70 per cent) Clay (20 per cent) Sand (10 per cent)
	Height (meters)	3.1	1.5	1.1	1.2
	Morphology	Moderately sloped	Moderately sloped	Gently sloped	Gently sloped
	Stability	Stable	Stable	Stable, but undefined	Stable, but undefined
Native aquatic vegetation and percent cover		*Elatine gratioloides (five* per cent*)* *Calmitricheae sp.* (10 per cent)	N/A	*Juncus usitatus (1* per cent*)* *Carex* sp. (0.5 per cent)	N/A

Habitat features		WC31
		Central
Channel morphology		Straight/Manmade
Stream type		Irrigation
Flow condition		Run/slow moving
Gradient °		one
Connectivity		Fish, including Murray Cod are commonly caught within the irrigation channel, and it appears to connect to key fish habitat, especially during floods.
Wetted width (meters)		5.3
Bank width (meters)		7.1
In stream vegetation cover (per cent)		0
Canopy cover (per cent)		0
Water depth (meters)		0.35
Water quality	**Turbidity (NTU)**	103
	pH	6.89
	DO (per cent)	86.9
	DO (mg/L)	9.13
	Temperature (°C)	13.1
	Conductivity (uS/cm)	53.5
Substrate (per cent)	**Clay <0.002 millimetres**	–
	Silt 0.002-0.02 millimetres	20
	Sand 0.02-2 millimetres	20
	Granule 2-4 millimetres	–
	Pebble 4-64 millimetres	–
	Cobble 64-256 millimetres	–
	Boulder >256 millimetres	–
	Organic	60

Habitat features		WC31
		Central
Debris	**Composition**	No debris
	Total cover (per cent)	
Left bank	**Veg cover (per cent)**	100
	Substrate	Sandy (30 per cent) Loam (20 per cent), Clay (30 per cent) Gravel (10 per cent)
	Height (meters)	0.6
	Morphology	Moderately sloped
	Stability	Stable
Right bank	**Veg cover (per cent)**	100
	Substrate	Sandy (30 per cent) Loam (20 per cent), Clay (30 per cent) Gravel (10 per cent)
	Height (meters)	0.6
	Morphology	Moderately sloped
	Stability	Stable
Native aquatic vegetation and percent cover		*Carex sp*. (0.5 per cent)

Habitat features		WC18			
		Downstream 500 meters	Downstream 100 meters	Central	Upstream 50–100 meters
Channel morphology		Meandering	Meandering	Meandering	Meandering
Stream type		Ephemeral, Flood Plain	Ephemeral, Flood Plain	Perennial, Flood Plain	Perennial, Flood Plain
Flow condition		No water	No water	Stagnant	Run/slow moving
Gradient °		one	one	1.25	one
Connectivity		Debris blockage at the old bridge			
Wetted width (meters)		–	–	6.7	21.2
Bank width (meters)		33.8	23.2	35.4	32.1
In stream vegetation cover (per cent)		30	60	30	30
Canopy cover (per cent)		15	10	one	one
Water depth (meters)		–	–	0.01	
Water quality	**Turbidity (NTU)**	No water	No water	Too shallow to measure	37
	pH				7.61
	DO (per cent)				95.1
	DO (mg/L)				9.87
	Temperature (°C)				14.1
	Conductivity (uS/cm)				410.3
Substrate (per cent)	**Clay <0.002 millimetres**	–	–	20	5
	Silt 0.002-0.02 millimetres	70	70	80	70
	Sand 0.02-2 millimetres	20	25	–	25
	Granule 2-4 millimetres	five	five	–	–
	Pebble 4-64 millimetres	–	–	–	–
	Cobble 64-256 millimetres	–	–	–	–
	Boulder >256 millimetres	–	–	–	–
	Organic	5	–	–	–

Habitat features		WC18			
		Downstream 500 meters	**Downstream 100 meters**	**Central**	**Upstream 50–100 meters**
Debris	**Composition**	Instream vegetation: 30 per cent	Woody Debris: 10 per cent Instream vegetation: 60 per cent	Woody Debris: 20 per cent Instream vegetation: 30 per cent Macrophytes: 30 per cent Overhanging vegetation: 1 per cent	Woody Debris: five per cent Instream vegetation: 30 per cent Overhanging vegetation: five per cent
	Total cover (per cent)	30	80	81	40
Left bank	**Veg cover (per cent)**	15	15	30	15
	Substrate	Loam (70 per cent), Clay (five per cent) Sand (15 per cent) Gravel (10 per cent)	Loam (70 per cent), Clay (5 per cent) Sand (15 per cent) Gravel (10 per cent)	Loam (60 per cent), Clay (20 per cent) Sand (15 per cent) Gravel (five per cent)	Clay (10 per cent) Rock (10 per cent) Sand (15 per cent) Loam (65 per cent)
	Height (meters)	1.3	1.2	2.5	3.2
	Morphology	Moderate to gently sloped	Moderate to gently sloped	Moderately sloped	Moderately sloped
	Stability	Stable	Stable	Moderate	Stable
Right bank	**Veg cover (per cent)**	15	15	15	15
	Substrate	Loam (70 per cent), Clay (five per cent) Sand (15 per cent) Gravel (10 per cent)	Loam (70 per cent), Clay (5 per cent) Sand (15 per cent) Gravel (10 per cent)	Loam (60 per cent), Clay (20 per cent) Sand (15 per cent) Gravel (five per cent)	Clay (10 per cent) Rock (10 per cent) Sand (15 per cent) Loam (65 per cent)
	Height (meters)	1.0	1.1	3.0	3.1
	Morphology	Gently sloped	Moderate to gently sloped	Moderately sloped	Steep
	Stability	Stable	Stable	Stable	Erosion present

Habitat features	WC18			
	Downstream 500 meters	**Downstream 100 meters**	**Central**	**Upstream 50–100 meters**
Native aquatic vegetation and percent cover	*Juncus usitatus (eight* per cent*)* *Alternanthera denticulata (three* per cent*)*	*Juncus usitatus (five* per cent*)*	*Elatine gratioloides (30* per cent*)* *Juncus usitatus (20* per cent*)* *Alternanthera denticulata (two* per cent*)* *Juncus australis (two* per cent*)* *Callitriche sonderi (two* per cent*)*	*Elatine gratioloides (30* per cent*)* *Juncus usitatus (10* per cent*)* *Juncus australis (two* per cent*)* *Alternanthera denticulata (two* per cent*)*

Habitat features		WC34			
		Downstream 500 meters	Downstream 100 meters	Central	Upstream 50-100 meters
Channel morphology		Meandering	Meandering	Meandering	Meandering
Stream type		Ephemeral	Ephemeral	Ephemeral	Ephemeral
Flow condition		No water	No water	No water	No water
Gradient °		0.75	1.25	1.25	
Connectivity		DS a bridge and fence may act as a barrier			
Wetted width (meters)		–	–	–	–
Bank width (meters)		23.2	25.1	25.6	13.6
In stream vegetation cover (per cent)		–	–	–	–
Canopy cover (per cent)		–	one	–	–
Water depth (meters)		–	–	–	–
Water quality	**Turbidity (NTU)**	No water	No water	No water	No water
	pH				
	DO (%)				
	DO (mg/L)				
	Temperature (°C)				
	Conductivity (uS/cm)				
Substrate (per cent)	**Clay <0.002 millimetres**	five	10	five	five
	Silt 0.002-0.02 millimetres	75	75	70	75
	Sand 0.02-2 millimetres	15	10	20	15
	Granule 2-4 millimetres	five	five	five	five
	Pebble 4-64 millimetres	–	–	–	–
	Cobble 64-256 millimetres	–	–	–	–
	Boulder >256 millimetres	–	–	–	–
	Organic	–	–	–	–

Habitat features		WC34			
		Downstream 500 meters	**Downstream 100 meters**	**Central**	**Upstream 50-100 meters**
Debris	**Composition**	No debris	No debris	No debris	No debris
	Total cover (per cent)				
Left bank	**Veg cover (per cent)**	60	65	60	55
	Substrate	Loam (70 per cent) Sand (15 per cent) Clay (five per cent) Granule (10 per cent)	Loam (70 per cent) Sand (20 per cent) Granule (10 per cent)	Loam (70 per cent) Sand (20 per cent) Granule (10 per cent)	Loam (70 per cent) Sand (20 per cent) Granule (10 per cent)
	Height (meters)	1.4	1.1	1.1	1.1
	Morphology	Gently sloped	Gently sloped	Gently sloped	Gently sloped
	Stability	Stable	Stable	Stable	Stable
Right bank	**Veg cover (per cent)**	65	55	70	
	Substrate	Loam (70 per cent) Sand (15 per cent) Clay (five per cent) Granule (10 per cent)	Loam (70 per cent) Sand (20 per cent) Granule (10 per cent)	Loam (70 per cent) Sand (20 per cent) Granule (10 per cent)	Loam (70 per cent) Sand (20 per cent) Granule (10 per cent)
	Height (meters)	1.1	1.7	1.7	1.1
	Morphology	Gently sloped	Moderate to Gently sloped	Gently sloped	Gently sloped
	Stability	Stable	Stable	Stable	Stable
Native aquatic vegetation and percent cover		N/A	N/A	N/A	*Juncus usitatus (one* per cent*)*

Habitat features		WC32			
		Downstream 500 meters	Downstream 100 meters	Central	Upstream 50-100 meters
Channel morphology		Straight	Straight	Straight	Straight
Stream type		Intermediate, but highly modified into an irrigation channel			
Flow condition		No water	No water	Stagnant	Stagnant
Gradient °		1.25	one	one	one
Connectivity		Culvert blocked			
Wetted width (meters)		–	–	1.5	1.2
Bank width (meters)		3.9	4.1	5.1	5.1
In stream vegetation cover (per cent)		two	two	one	0.5
Canopy cover (per cent)		–	–	–	1
Water depth (meters)		–	–	0.2	0.15
Water quality	**Turbidity (NTU)**	No water	No water	106	70
	pH			8.17	8.2
	DO (per cent)			88.4	93.6
	DO (mg/L)			9.25	9.53
	Temperature (°C)			13.2	14.6
	Conductivity (uS/cm)			392.7	415
Substrate (per cent)	**Clay <0.002 millimetres**	–	–	–	five
	Silt 0.002-0.02 millimetres	90	90	90	50
	Sand 0.02-2 millimetres	five	five	five	five
	Granule 2-4 millimetres	five	five	five	–
	Pebble 4-64 millimetres	–	–	–	–
	Cobble 64-256 millimetres	–	–	–	–
	Boulder >256 millimetres	–	–	–	–
	Organic	–	–	–	40

Habitat features		WC32			
		Downstream 500 meters	**Downstream 100 meters**	**Central**	**Upstream 50-100 meters**
Debris	**Composition**	Overhanging vegetation – two per cent	Overhanging vegetation – two per cent	Overhanging vegetation – one per cent	Overhanging vegetation – one per cent
	Total cover (per cent)	two	two	one	one
Left bank	**Veg cover (per cent)**	30	40	40	50
	Substrate	Loam (90 per cent) Sand (five per cent) Gravel (five per cent)	Loam (90 per cent) Sand (five per cent) Gravel (five per cent)	Loam (90 per cent) Sand (five per cent) Gravel (five per cent)	Loam (85 per cent) Sand (five per cent) Clay (five per cent) Gravel (5 per cent)
	Height (meters)	0.6	0.5	0.5	0.5
	Morphology	Gently sloped	Gently sloped	Gently sloped	Gently sloped
	Stability	Stable	Stable	Stable	Stable
Right bank	**Veg cover (per cent)**	40	30	40	45
	Substrate	Loam (90 per cent) Sand (five per cent) Gravel (five per cent)	Loam (90 per cent) Sand (five per cent) Gravel (five per cent)	Silt (90 per cent) Sand (five per cent) Gravel (five per cent)	Loam (85 per cent) Sand (five per cent) Clay (five per cent) Gravel (five per cent)
	Height (meters)	0.7	0.5	0.5	0.5
	Morphology	Gently sloped	Gently sloped	Gently sloped	Gently sloped
	Stability	Stable	Stable	Stable	Stable
Native aquatic vegetation and percent cover		*Juncus usitatus* (one per cent) *Marsilea drummondii.* (one per cent)	*Juncus usitatus* (one per cent)	*Juncus usitatus* (10 per cent) *Marsilea drummondii.* (one per cent) *Eleocharis acuta* (three per cent)	*Juncus usitatus* (15 per cent) *Eleocharis acuta* (25 per cent) *Chara braunii* (five per cent) *Marsilea drummondii.* (one per cent)

Habitat features		WC33		
		Downstream 100 meters	Central	Upstream 50-100 meters
Channel morphology		Straight	Straight	Straight
Stream type		Irrigation/Manmade	Irrigation/Manmade	Irrigation/Manmade
Flow condition		No water	No water	No water
Gradient °		one	one	one
Connectivity		Does not appear to connect to fish bearing watercourse		
Wetted width (meters)		–	–	–
Bank width (meters)		5.7	6.1	5.8
In stream vegetation cover (per cent)		70	70	five
Canopy cover (per cent)		–	–	–
Water depth (meters)		–	–	–
Water quality	Turbidity (NTU)	No Water	No Water	No Water
	pH			
	DO (per cent)			
	DO (mg/L)			
	Temperature (°C)			
	Conductivity (uS/cm)			
Substrate (per cent)	Clay <0.002 millimetres	–	five	–
	Silt 0.002-0.02 millimetres	90	85	90
	Sand 0.02-2 millimetres	five	five	five
	Granule 2-4 millimetres	five	five	five
	Pebble 4-64 millimetres	–	–	–
	Cobble 64-256 millimetres	–	–	–
	Boulder >256 millimetres	–	–	–
	Organic	–	–	–

Habitat features		WC33		
		Downstream 100 meters	**Central**	**Upstream 50-100 meters**
Debris	**Composition**	Instream vegetation – 70 per cent	Instream vegetation – 70 per cent	Instream vegetation – five per cent
	Total cover (per cent)	70	70	five
Left bank	**Veg cover (per cent)**	65	65	70
	Substrate	Loam 90 per cent Sand five per cent Granule five per cent	Loam 90 per cent Sand five per cent Granule five per cent	Loam 90 per cent Sand five per cent Granule five per cent
	Height (meters)	1.1	1.1	1.0
	Morphology	Moderately sloped	Moderately sloped	Moderately sloped
	Stability	Stable	Stable	Stable
Right bank	**Veg cover (per cent)**	65	65	40
	Substrate	Loam 90 per cent Sand five per cent Granule five per cent	Loam 90 per cent Sand five per cent Granule five per cent	Loam 90 per cent Sand five per cent Granule five per cent
	Height (meters)	1.5	1.5	0.8
	Morphology	Moderately sloped	Moderately sloped	Moderately sloped
	Stability	Stable	Stable	Stable
Native aquatic vegetation and percent cover		*Marsilea drummondii* (five per cent) *Eleocharis acuta* (*30* per cent) *Myriophyllum verrucosum* (*35* per cent)	*Juncus usitatus* (*10* per cent) *Myriophyllum verrucosum.* (*50* per cent) *Marsilea drummondii.* (*0.5* per cent)	*Eleocharis acuta* (*one* per cent)

Habitat features		WC40
		Central
Channel morphology		Straight/Manmade
Stream type		Irrigation
Flow condition		No water
Gradient °		1.25
Connectivity		Man made drainage that connects to dam for livestock. Does not appear to have connectivity to fish bearing watercourses.
Wetted width (meters)		–
Bank width (meters)		5.8
In stream vegetation cover (per cent)		70
Canopy cover (per cent)		–
Water depth (meters)		–
Water quality	**Turbidity (NTU)**	No water
	pH	
	DO (per cent)	
	DO (mg/L)	
	Temperature (°C)	
	Conductivity (uS/cm)	
Substrate (per cent)	**Clay** **<0.002 millimetres**	five
	Silt **0.002-0.02 millimetres**	70
	Sand **0.02-2 millimetres**	20
	Granule **2-4 millimetres**	five
	Pebble **4-64 millimetres**	–
	Cobble **64-256 millimetres**	–
	Boulder **>256 millimetres**	–
	Organic	–

Habitat features		WC40
		Central
Debris	**Composition**	Vegetation on the stream bed, but no aquatic, only terrestrial weeds (70 per cent).
Left bank	**Veg cover (per cent)**	15
	Substrate	Sandy (15 per cent) Loam (70 per cent), Clay (five per cent) Gravel (five per cent)
	Height (meters)	0.6
	Morphology	Moderately to gently sloped
	Stability	Stable
Right bank	**Veg cover (per cent)**	15
	Substrate	Sandy (15 per cent) Loam (70 per cent), Clay (five per cent) Gravel (five per cent)
	Height (meters)	0.8
	Morphology	Moderately to gently sloped
	Stability	Stable
Native aquatic vegetation and percent cover		N/A

Habitat features		WC41
		Central
Channel morphology		Straight/Manmade
Stream type		Irrigation
Flow condition		No water
Gradient °		1.25
Connectivity		Man made drainage that connects to dam for livestock. Does not appear to have connectivity to fish bearing watercourses.
Wetted width (meters)		–
Bank width (meters)		4.5
In stream vegetation cover (per cent)		60
Canopy cover (meters)		–
Water depth (meters)		–
Water quality	**Turbidity (NTU)**	No water
	pH	
	DO (per cent)	
	DO (mg/L)	
	Temperature (°C)	
	Conductivity (uS/cm)	
Substrate (per cent)	**Clay** **<0.002 millimetres**	five
	Silt **0.002-0.02 millimetres**	75
	Sand **0.02-2 millimetres**	15
	Granule **2-4 millimetres**	five
	Pebble **4-64 millimetres**	–
	Cobble **64-256 millimetres**	–
	Boulder **>256 millimetres**	–
	Organic	–

Habitat features		WC41
		Central
Debris	**Composition**	Vegetation on the stream bed, but no aquatic, only terrestrial flora including *Atriplex sp.* (60%).
Left bank	**Veg cover (per cent)**	five
	Substrate	Sandy (15 per cent) Loam (70 per cent), Clay (five per cent) Gravel (five per cent)
	Height (meters)	0.6
	Morphology	Gently sloped
	Stability	Stable
Right bank	**Veg cover (per cent)**	10
	Substrate	Sandy (15 per cent) Loam (70 per cent), Clay (five per cent) Gravel (five per cent)
	Height (meters)	0.5
	Morphology	Gently sloped
	Stability	Stable
Native aquatic vegetation and percent cover		N/A

Habitat features		WC54			
		Downstream 500 meters	Downstream 100 meters	Central	Upstream 50-100 meters
Channel morphology		Meandering	Meandering	Meandering	Meandering
Stream type		Intermittent	Intermittent	Intermittent	Intermittent
Flow condition		Stagnant/ slow moving	Stagnant/ slow moving	Stagnant/ slow moving	Stagnant/ slow moving
Gradient °		1.25	two	two	two
Connectivity		The current road crossing result in a fish passage problem			
Wetted width (meters)		1.0	0.8	0.8	0.8
Bank width (meters)		4.7	2.5	6.3	8.0
In stream vegetation cover (per cent)		10	40	10	70
Canopy cover (per cent)		one	five	five	25
Water depth (meters)		0.2	0.05	0.03	0.05
Water Quality	**Turbidity (NTU)**	43	Too shallow to test	Too shallow to test	Too shallow to test
	pH	7.41			
	DO (per cent)	152.2			
	DO (mg/L)	12.24			
	Temperature (°C)	26.4			
	Conductivity (uS/cm)	348			
Substrate (per cent)	**Clay <0.002 millimetres**	–	–	–	–
	Silt 0.002-0.02 millimetres	30	20	35	15
	Sand 0.02-2 millimetres	10	15	35	25
	Granule 2-4 millimetres	50	70	30	–
	Pebble 4-64 millimetres	–	–	–	–
	Cobble 64-256 millimetres	–	–	–	–
	Boulder >256 millimetres	–	–	–	–
	Organic	10	–	–	60

Habitat features		WC54			
		Downstream 500 meters	**Downstream 100 meters**	**Central**	**Upstream 50-100 meters**
Debris	**Composition**	Macrophyte – 80 per cent Overhanging vegetation – five per cent	Woody debris – five per cent Overhanging vegetation – 50 per cent	Woody debris – two per cent Anthropogenic material – 30 per cent Overhanging vegetation – 50 per cent	Woody debris – three per cent Macrophyte – 60 per cent Overhanging vegetation – 10 per cent
	Total cover (per cent)	85	55	82	73
Left bank	**Veg cover (per cent)**	80	10	70	100
	Substrate	Loam (60 per cent) Sand (10 per cent) Granules (30 per cent)	Loam (90 per cent) Sand (five per cent) Granules (five per cent)	Loam (90 per cent) Sand (five per cent) Granules (five per cent)	Loam (40 per cent) Sand (35 per cent) Granules (25 per cent)
	Height (meters)	1.0	1.4	2.0	0.6
	Morphology	Gently sloped to a vertical	Undercut	Vertical with undercut area	Moderately to gently sloped
	Stability	Stable	Very unstable with undercut banks	Highly eroded	Stable
Right bank	**Veg cover (per cent)**	100	15	60	100
	Substrate	Loam (60 per cent) Sand (10 per cent) Granules (30 per cent)	Loam (90 per cent) Sand (five per cent) Granules (five per cent)	Loam (90 per cent) Sand (five per cent) Granules (five per cent)	Loam (40 per cent) Sand (35 per cent) Granules (25 per cent)
	Height (meters)	0.9	2.0	1.5	0.6
	Morphology	Moderately sloped	Undercut	Vertical	Moderately sloped
	Stability	Stable	Very unstable with undercut banks	Erosion visible	Stable

Habitat features	WC54			
	Downstream 500 meters	**Downstream 100 meters**	**Central**	**Upstream 50-100 meters**
Native aquatic vegetation and percent cover	*Ranunculus sp.* (*30* per cent) *Lemna disperma* (five per cent) *Juncus usitatus* (eight per cent) *Carex appressa* (five per cent)	*Juncus sp.* (five per cent) *Carex appressa* (five per cent)	*Juncus usitatus* (one per cent) *Carex appressa* five per cent)	*Lemna disperma* (*25* per cent) *Carex appressa* (five per cent)

NTU = nephelometric turbidity unit; uS/cm = microSiemens per centimetre; mg/L = milligrams per litre; °C = Degrease Celsius

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Appendix N

Partial impact assessment

Our ref: PS117658-NCL-ECO-LTR-001 RevA PECE

By email
Luke.Fania@transgrid.com.au

1 July 2025

Luke Fania
Environment and Sustainability Manager
Project EnergyConnect
Transgrid
Level 19, 83 Clarence Street,
Sydney NSW 2000

Dear Luke,

Update on Partial Impacts under the NSW Biodiversity Assessment Method for Project EnergyConnect East

1. Introduction to the project and approach

This letter has been prepared by WSP Australia Pty Ltd (WSP) on behalf of Transgrid for Project Energy Connect Eastern Section (PECE) (the project).

WSP prepared a Biodiversity Development Assessment Report (BDAR) for the project in accordance with NSW Biodiversity Assessment Method 2020 (BAM) and the project was subsequently approved.

A key component of the project assessment was consideration of partial impacts on native vegetation within the electrical transmission line (ETL) during construction and ongoing operational maintenance and how these partial impacts are assessed under the BAM.

Following ongoing consultation with the NSW Conservation Programs, Heritage and Regulation (CPHR) (formerly Biodiversity Conservation & Science (BCS)) a range of assessment approach key considerations were identified, with a particular focus on providing a project specific and evidence-based approach.

This letter presents the finding of the post construction verification survey and assessment of partial impacts for the project.

The project disturbance area assessed within the BDAR was identified based on realistic but predicted project component locations and construction areas, however at the time of approval the disturbance area was still conceptual and indicative. The project disturbance area has the same meaning as ‘development site’ or ‘subject land’ as defined in the BAM.

The actual area of disturbance for the project required the finalisation of design and construction methodology and was developed in consideration of post approval management requirements for avoidance and impact minimisation.

The project considered the disturbance area would have varying degrees of physical disturbance along the transmission line alignment to reflect construction and operational requirements, and these were applied to the biodiversity assessment in the BDAR. For the approved BDAR, disturbance area was divided into the following areas:

- **Disturbance area A** – refers to an area around transmission towers, for access tracks and between transmission towers in which it is assumed vegetation would be removed during construction and

subject to ongoing maintenance during operation (i.e. removal to ground level) (with the exception of temporary access tracks) for operational and safety requirements (including bushfire).

Disturbance area B – refers to an area between transmission towers in which partial vegetation removal would only be required to meet the vegetation clearance heights, which would not generally require disturbance at ground level. However, where trees within this area would or have the potential to exceed vegetation clearance heights, these trees would be removed and may result in temporary ground disturbance. Vegetation clearance heights are set by Transgrid for operational and safety requirements, including bushfire risk management. This zone is a subset to the indicative disturbance area.

- Disturbance area B4 – is a subset of disturbance area B where partial vegetation clearing is restricted to vegetation with growth height above 4 metres.
- Disturbance area B10 – is a subset of disturbance area B where partial vegetation clearing is restricted to vegetation with growth height above 10 metres.

The width of the disturbance areas A, B4 and B10 areas for transmission line components vary for the based on their vegetation clearing requirements and construction methodologies. Figure 1.1 identifies the allocation of each area for each line type.

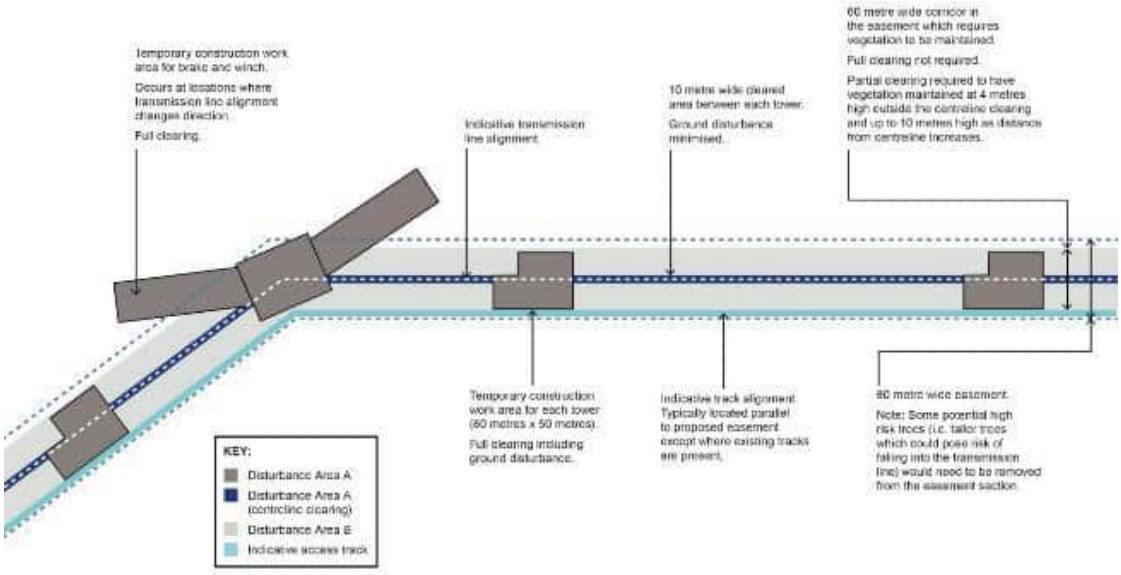


Figure 1.1 Indicative disturbance area definition for a typical twin 330 kV transmission line section

2. Partial impacts in the ETL

2.1 Overview

The project has identified partial impacts that are applicable to two disturbance zones:

- Disturbance area B4 – is a subset of disturbance area B where partial vegetation clearing is restricted to vegetation with growth height above 4 metres.
- Disturbance area B10 – is a subset of disturbance area B where partial vegetation clearing is restricted to vegetation with growth height above 10 metres.

These zones are associated with areas of the ETL corridor not subject to permanent construction footprints but rather areas of vegetation maintenance.

ETL corridor management traditionally focuses on the complete removal of vegetation using short rotation times with the aim to reduce the perceived fire hazard associated with transmission line corridor vegetation.

The project has taken a different bespoke approach where the maintenance zone underneath the transmission line will be managed through the removal of vegetation with specific growth height levels in accordance with vegetation clearing requirements (i.e. down to a growth height of 4 and 10 metres) leaving the midstory and ground layers intact (Figure 2.1).

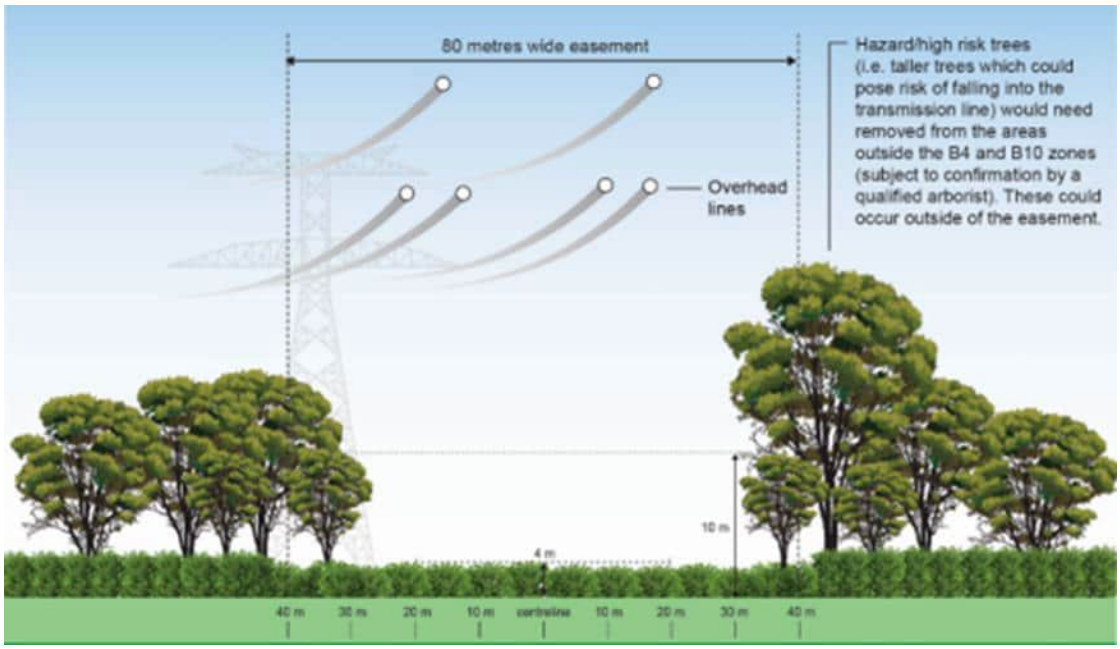


Figure 2.1 Conceptual layout of transmission line project

This partial clearing of the ETL easement forms part of the measures taken to minimise impacts to biodiversity values. Maintaining an understory layer aims to avoid total loss of species richness, encourage native species and limit colonisation opportunities of introduced species (see Clarke and White, 2008).

2.1.1 Key partial impacts to be considered

The construction and maintenance of vegetation will still require the need to trim, spray or otherwise suppress some forms of woody vegetation under powerlines. These impacts require quantification, with the key attributes likely to be affected and assessed under the BAM being:

- tree composition and structure
- shrub composition and structure
- litter cover function
- coarse woody debris function
- stem size class function
- regeneration function

Following consultation with BCS, the following impacts were specifically identified for potential removal and suppression of the tree and shrub growth forms, which also has the potential to expose all other lower growth forms to indirect impacts including, but not limited to:

- disturbance facilitating penetration of the vegetation assemblage by exotic weed species,

- a localised reduction/loss of the stored aerial and soil seed bank through the removal and disturbance of topsoil and the loss of serotinous flora species,
- a localised change in the microclimate of the vegetation assemblage and habitat i.e. changes in temperature, wind, light and humidity because of the loss of canopy cover in the assemblage,
- a localised change in the hydrology of the vegetation assemblage and habitat i.e. changes in surface water flows because of the loss of structural features capturing surface water,
- a localised change in the soil conditions of the vegetation assemblage and habitat i.e. increased sedimentation and nutrient availability because of direct impact to the soil profile and the removal of stabilising vegetation, and
- a localised change in species interactions such as pollination and seed dispersal.

2.2 Literature based theory on partial impacts for ETL

ETL clearings develop into novel habitats over time (see Eldridge, Eyitayo et al., 2017) and species and functional composition have been shown to be different between sites with control and thinned canopy treatments with proportionally more individuals of grasses and forbs in thinned plots (see Tsai et al., 2018). Where structural elements such as the canopy tree layer is removed from existing ETL easements across NSW, shrubby mid storey layer, or derived shrub land and grassland vegetation structure may develop.

Canopy opening disturbance has immediate and substantive effects on understory microclimate and therefore the establishment and growth of understory plants (Tsai et al., 2018). Where shrub and ground stratum cover increases, it has been documented that composition or species richness may decrease through species being outcompeted by more dominant and faster growing species. Studies show a general shift to early successional shade intolerant species and those species that reproduce through clonal growth (see Luken, et al., 1992; Eldridge, Eyitayo et al. 2017; Walker & Koen, 1995).

Specifically, for the project, the Plant Community Types (PCTs) with existing woody shrub layers would likely see increases in the future shrub and ground layers cover scores, while for those PCTs with greater grassy understorey components (e.g. Grassy Woodlands) similar future increase in vegetation cover for grass and grass like, forb, fern and other species cover attributes is likely (Nobel, 1997; Both et al. 1996).

2.3 Approach to partial impacts within BAM Calculator

To facilitate these partial impact scenarios the BAM provides for circumstances where partial clearing of vegetation is proposed and remaining vegetation will be maintained (i.e. not degraded further over time). The consideration of these partial impacts within the BAM Calculator (BAM-C) is applied through the adjustment of future value of the relevant vegetation integrity (VI) attributes. In assessing direct impacts on native vegetation, future VI scores were calculated in the BAM-C for each disturbance area subset and associated vegetation zone as follows:

- For disturbance area A, the future vegetation integrity score was calculated as zero (assuming total loss of native vegetation).
- For disturbance area B (partial clearing of the transmission line easement) future vegetation integrity scores were calculated through changes to mean average scores in attributes associated with composition condition, structure condition and function condition.

2.3.1 BAM-C key limitations in ability to measure partial impacts.

The BAM-C has a number of limitations when assessing partial impact, particularly the inflexibility in the input functions to calculate future vegetation integrity scores and specifically in that attributes can only be decreased from the recorded mean average.

In addition, attribute scores cannot be increased when using the clearing module. This limitation means the composition, structure and function attributes cannot adjusted to reflect increases in attributes observed or considered likely from existing transmission line easements (e.g. increased shrub cover due to tree removal).

These deficiencies in the BAM-C generate overlapping conservatism in the final measurement of change in VI for partial impacts.

A summary of some key limitations of BAM-C is provided below:

- Only measures reductions in attributes values and not gains (e.g. increased shrub or grass cover or diversity are not measured)
- VI changes are limited by benchmark data and seasonal influences (changes that are still above benchmark values indicate no change in VI). For example, an observed decrease in forb diversity in a high condition PCT with substantially higher diversity than benchmark values will only generate a change in the VI scores if it falls below the upper benchmark value.

2.3.2 Approved approach to partial impacts in RTS BDAR

The approved approach adopted for the project assessment of partial impact in accordance with BAM incorporated the following conservative, literature-based change in VI scores:

- all canopy attributes to zero
- 30% reduction in composition of understory shrub, grass & grass like, forb, fern and other species
- 25% reduction in leaf litter and fallen timber.

These approved changes in BAM-C VI partial impact for Semi-arid Woodlands (Grassy sub-formation), Semi-arid Woodlands (Shrubby sub-formation), Grassy Woodlands, Forested Wetlands and Dry Sclerophyll Forests (Shrubby sub-formation) for the project resulted in VI reductions up to a -58 in VI scores.

3. Methodology for review of post-construction partial impacts

3.1 Overview

To assess the post-construction partial impact against the predicted effects, field verification of the partial impact area was sampled across the project study area within a selection of PCTs and IBRA Subregions. This field survey provides an evidence-based approach that builds on and refines the previous literature-based assumptions in assessing partial impact.

Due to the known influencing variables of surveyor bias and seasonality on BAM vegetation integrity values, direct analysis of predicted VI scores within the BDAR with current VI scores collected from of the partial impacted zones is uninformative.

To mitigate these influences, paired control plots were collected for each sampled partial impact site. In this way evaluation of changes in VI loss could be directly compared between the post-construction datasets and those predicted within the BDAR.

Additionally, to remove possible data skew caused by natural variation across sampled PCTs and subregions, the average approved BDAR VI, VI loss and approved BDAR predicted VI for partial

clearing areas for each vegetation formation has been calculated based on vegetation in moderate-good condition within subregions and PCTs subject to post-construction plots sampling.

A total of 44 BAM plots across 13 PCTs were sampled, covering Semi-arid Woodlands (Grassy sub-formation), Semi-arid Woodlands (Shrubby sub-formation), Grassy Woodlands, Forested Wetlands and Dry Sclerophyll Forests (Shrubby sub-formation).

In addition, a further 10 BAM plots were sampled from three dominant formations within existing ETLs that have been historically managed by Transgrid for >20 Years.

A summary of sampled PCTs is provided in Table 3.1. The classification of partial impact plots for historic easements (PL) and post-construction (PECe) is provided in Table 3.2. The survey site locations, compared to the indicative PECe disturbance model, are provided in Figure 3.1.

Table 3.1 PCTs subject to field survey

PCT Number	PCT	IBRA Subregion
Semi-Arid Woodlands (Grassy sub-formation)		
15	Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	South Olary Plain Murrumbidgee
26	Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion	Murrumbidgee Lachlan
Semi-Arid Woodlands (Shrubby sub-formation)		
22	Semi-arid shrubby Buloke - Slender Cypress Pine Woodland, far south-western NSW	South Olary Plain
28	White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone	Murrumbidgee
58	Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion	South Olary Plain Murrumbidgee
75	Yellow Box - White Cypress Pine grassy woodland on deep sandy-loam alluvial soils of the eastern Riverina Bioregion and western NSW South Western Slopes Bioregion	Lower Slopes
170	Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones	South Olary Plains
171	Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion	South Olary Plains
172	Deep sand mallee of irregular dunefields of the semi-arid (warm) zone	South Olary Plains
Grassy Woodlands		
80	Western Grey Box - White Cypress Pine tall woodland on loam soil on alluvial plains of NSW South Western Slopes Bioregion and Riverina Bioregion	Lower Slopes
Forested Wetlands		
8	River Red Gum - Warrego Grass - Couch Grass riparian tall woodland wetland of the semi-arid (warm) climate zone (Riverina Bioregion and Murray Darling Depression Bioregion)	Murrumbidgee Robinvale Plains
11	River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Murrumbidgee
Dry Sclerophyll Forest (Shrubby Sub-formation)		
110	Western Grey Box - Cypress Pine shrubby woodland on stony footslopes in the NSW South Western Slopes Bioregion and Riverina Bioregion	Inland Slopes

Table 3.2 Classification of historic easement and post-construction (PECe) Partial Impact plots based on formation and PCT.

Formation Type	PCT	Historic Easement	PECe Easement
Semi-arid Woodlands (Grassy sub-formation)	15	BlackBox_02PL	BlackBox_01PECe BlackBox_02PECe BlackBox_03PECe
	26	Myall_01PL	Myall_02PECe Myall_03PECe Myall_04PECe
Semi-arid Woodlands (Shrubby sub-formation)	22	-	Pine_01PECe
	28	Pine_02PL	Pine_02PECe Pine_03PECe
	58	BlackOak_01PL BlackOak_03PL	BlackOak_01PECe BlackOak_02PECe BlackOak_03PECe
	75	-	Grassy_02PECe Grassy_04PECe
	170	Mallee_02PL	Mallee_02PECe
	171	-	Mallee_03PECe
	172	Mallee_01PL	Mallee_01PECe
Grassy Woodland	80	-	Grassy_01PECe Grassy_03PECe
Forested Wetlands	8	RedGum_01PL RedGum_02PL	RedGum_02PECe
	11	RedGum_03PL	RedGum_03PECe
Dry Sclerophyll Forest (Shrubby Sub-formation)	110	-	DrySclero_01PECe



Figure 3.1 - Partial Impact Survey Locations

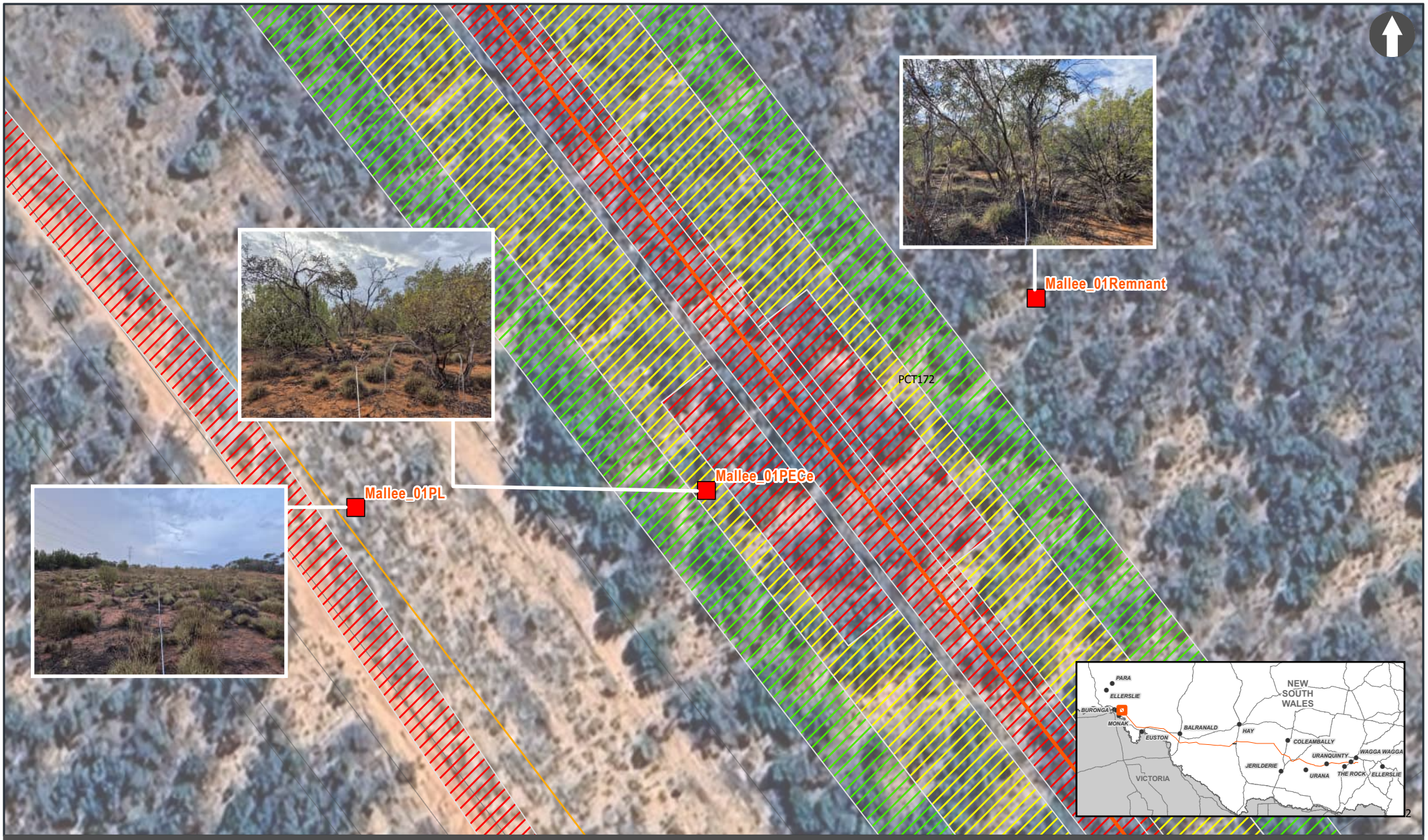


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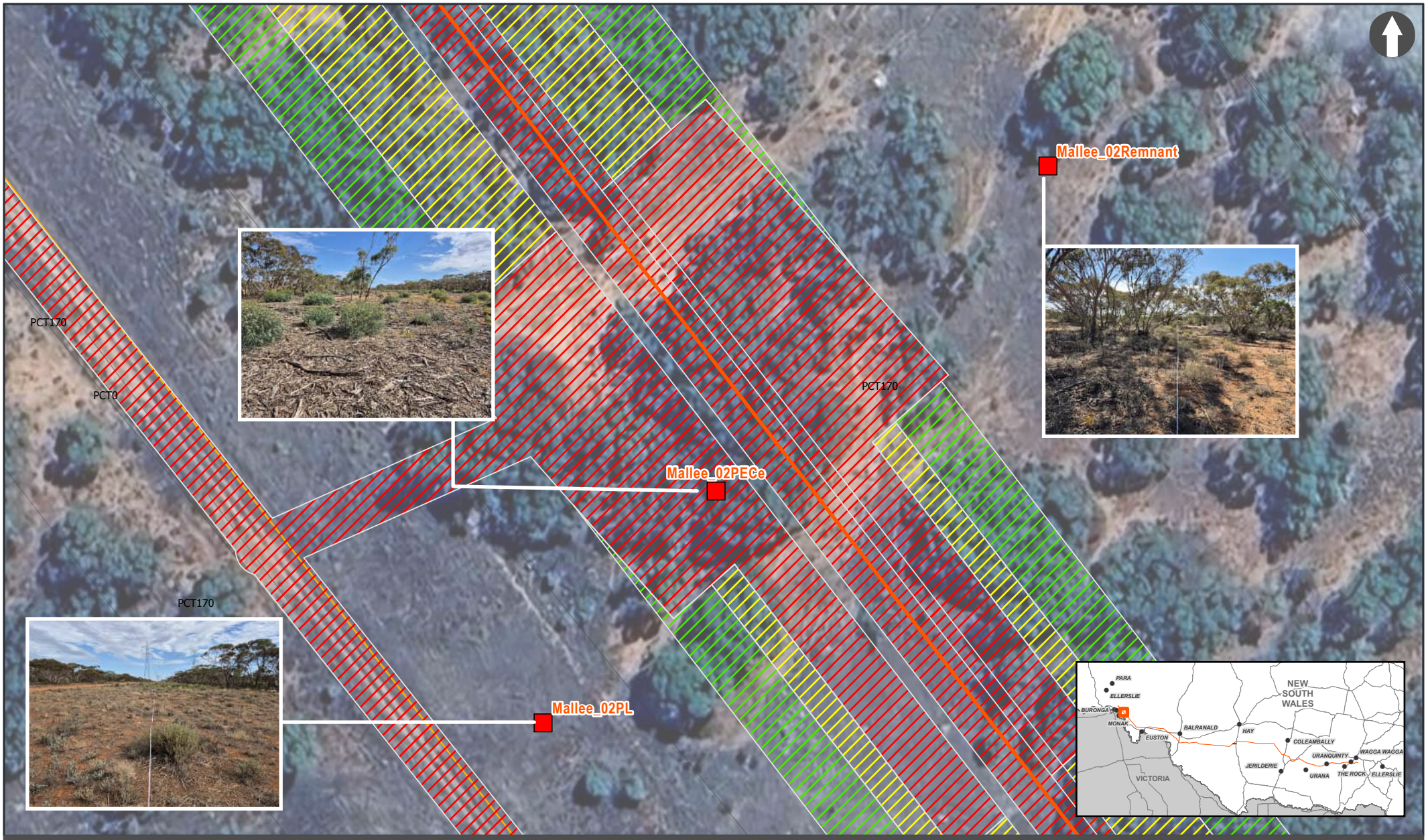


Figure 3.1 - Partial Impact Survey Locations



PECe Post-approval survey

- Plot reference
- Field Verified Vegetation
- Electricity Transmission
- EnergyConnect Alignment

PECe Disturbance Model

- Disturbance Area A - Full Impact
- B4 - Partial Impact (4m)
- B10 - Partial Impact (10m)

Figure 3.1 - Partial Impact Survey Locations

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Source: NSWSS, ESRI, Transgrid, WSP



0 25 50 Meters

PECe Post-approval survey

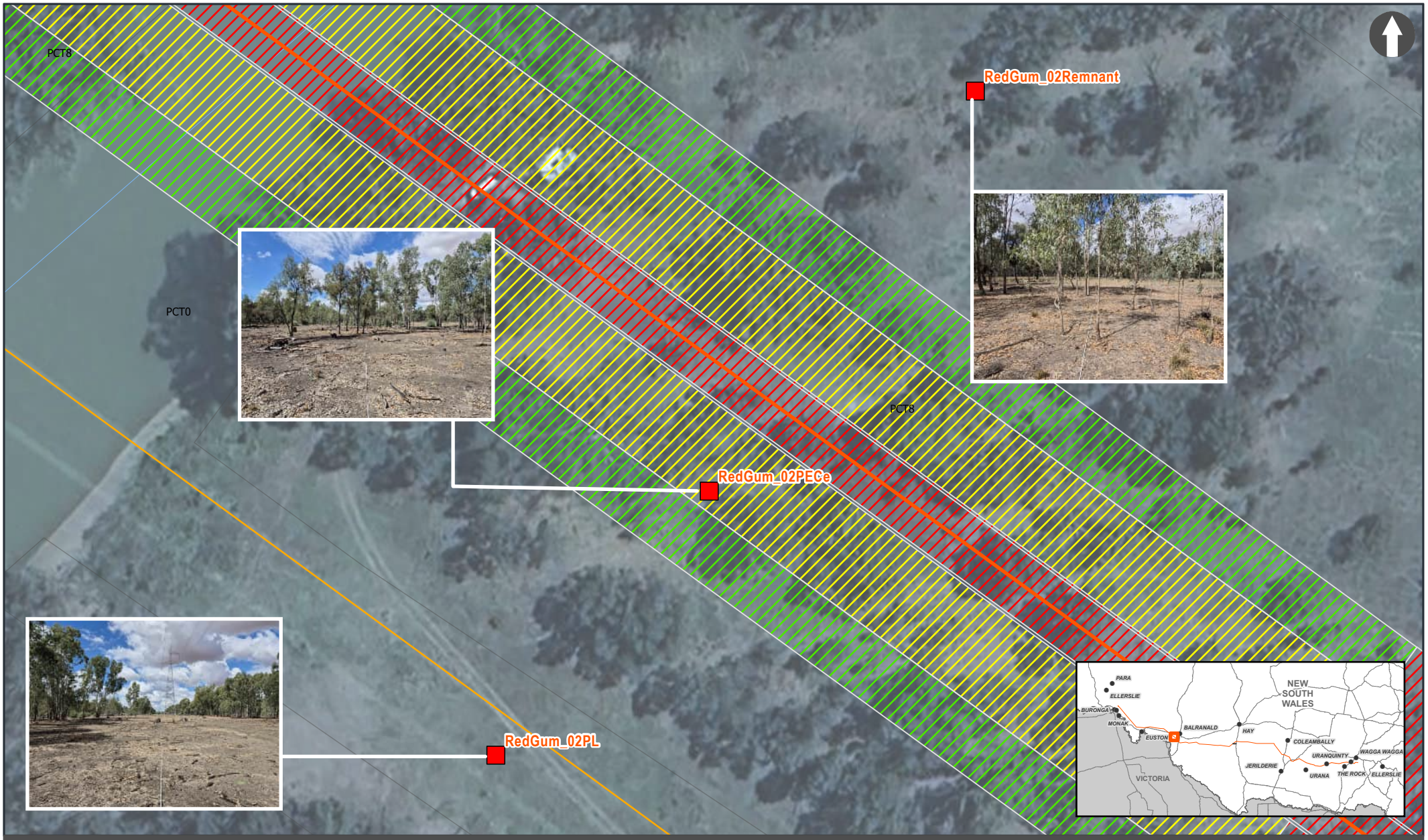
Plot reference

Electricity Transmission

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Source: NSWSS, ESRI, Transgrid, WSP



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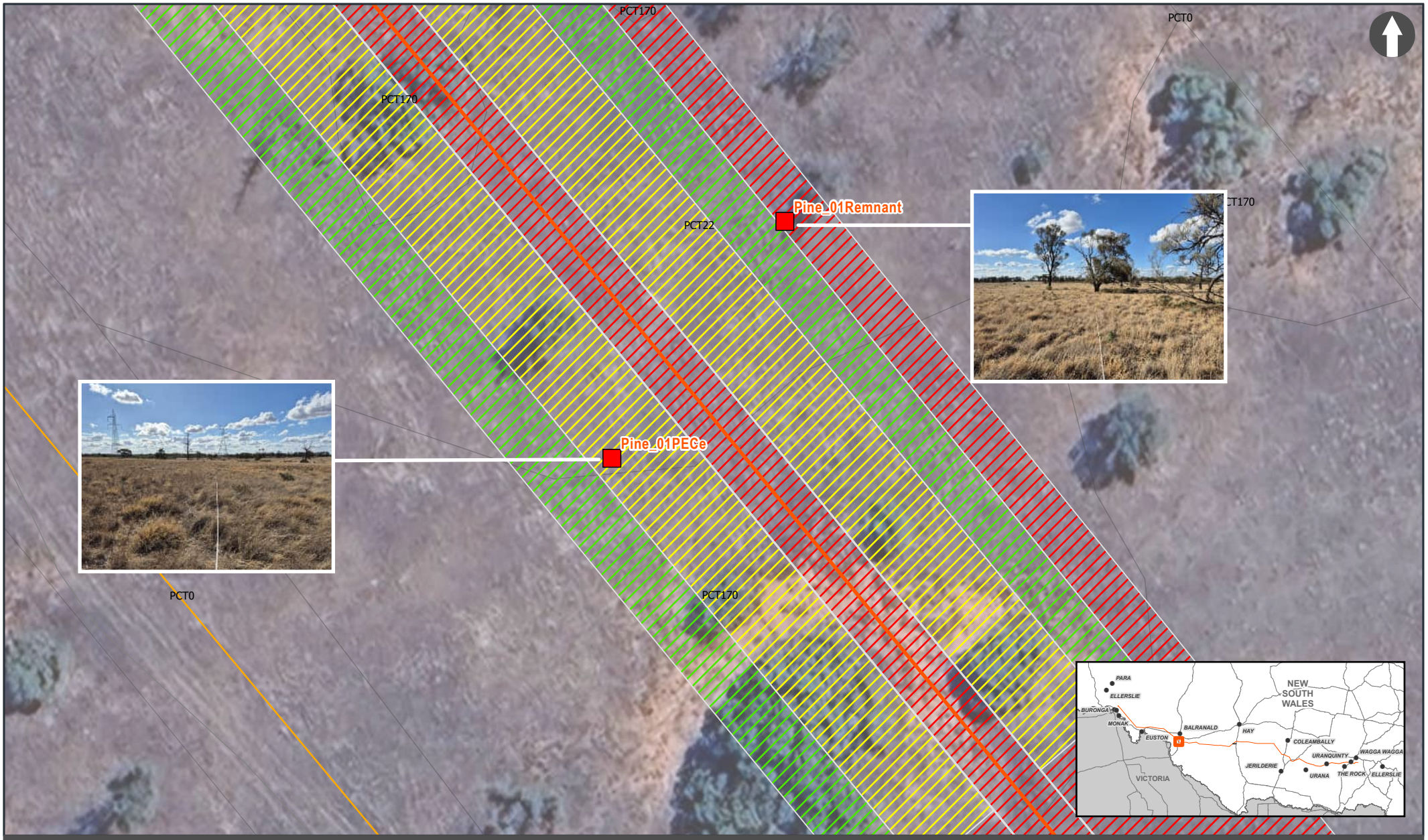
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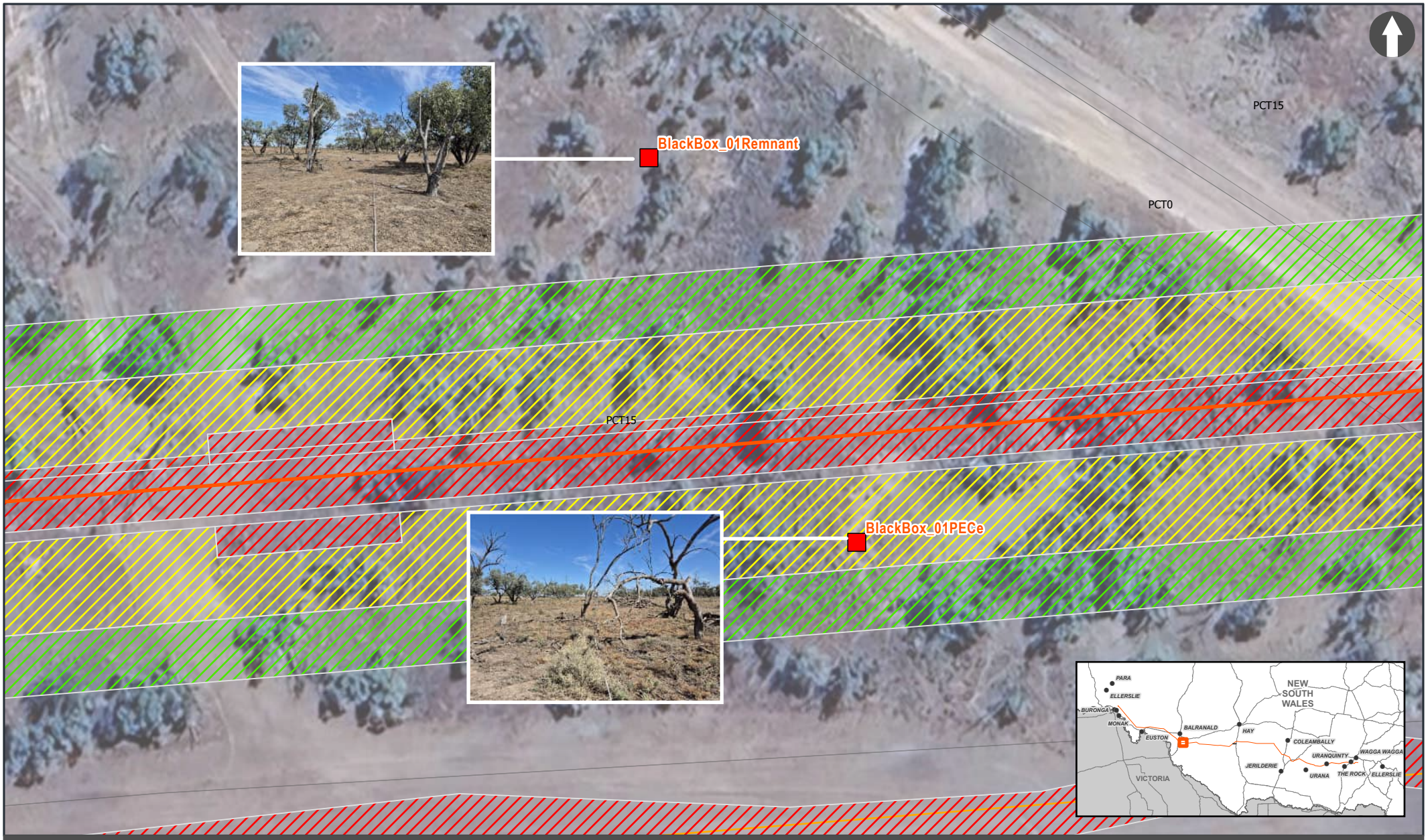


Figure 3.1 - Partial Impact Survey Locations



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Electricity Transmission
EnergyConnect Alignment

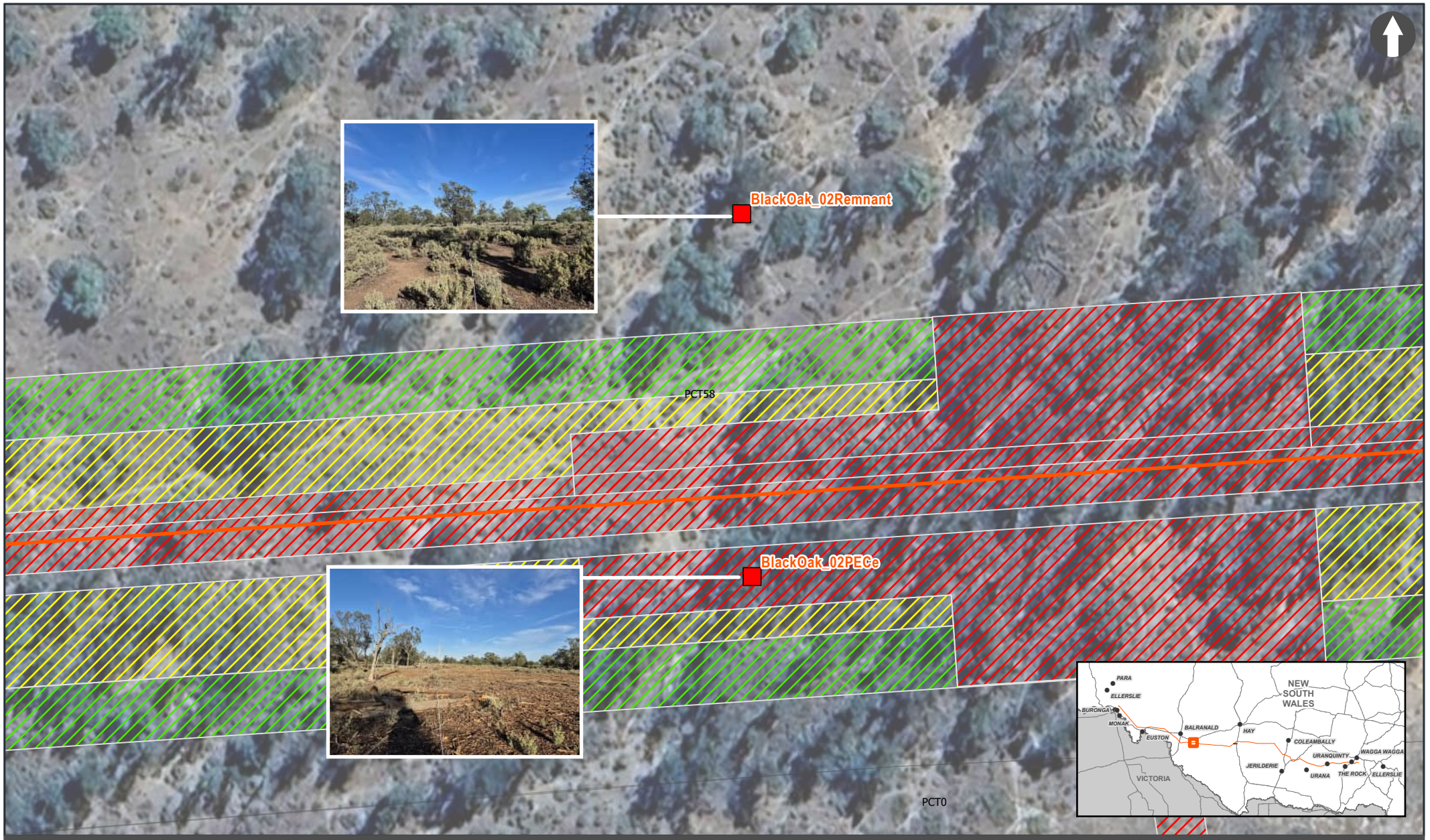
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Source: NSWSS, ESRI, Transgrid, WSP



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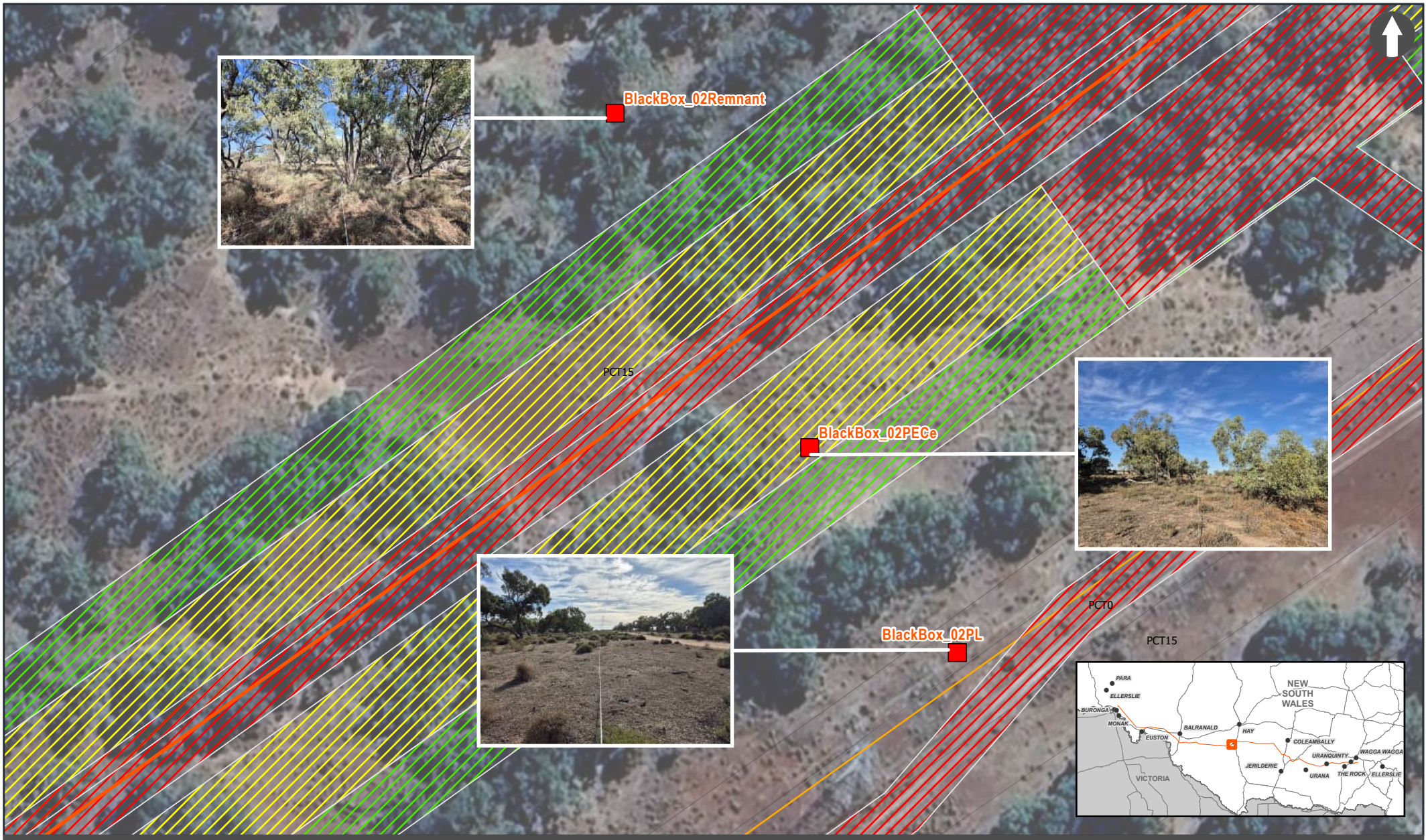


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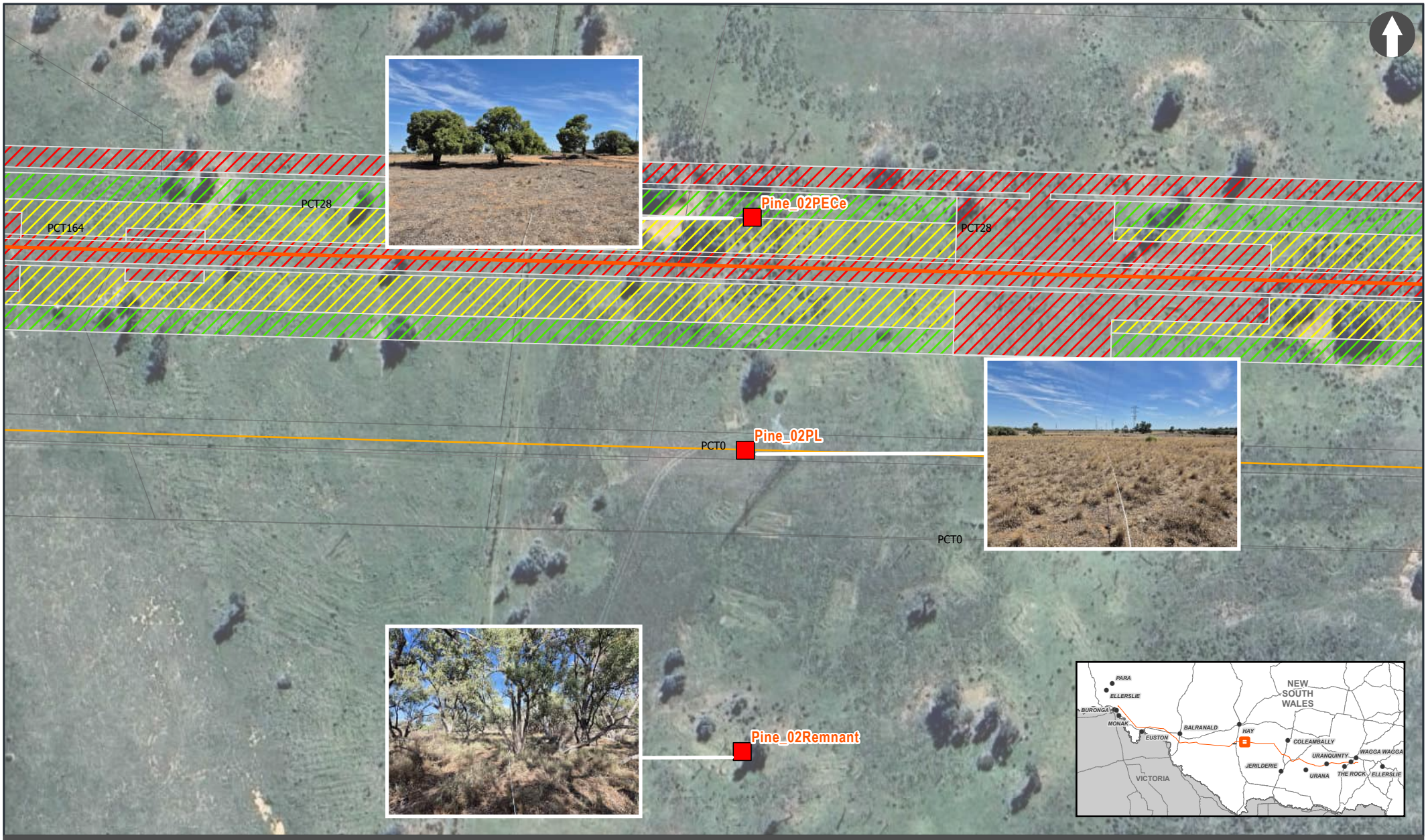


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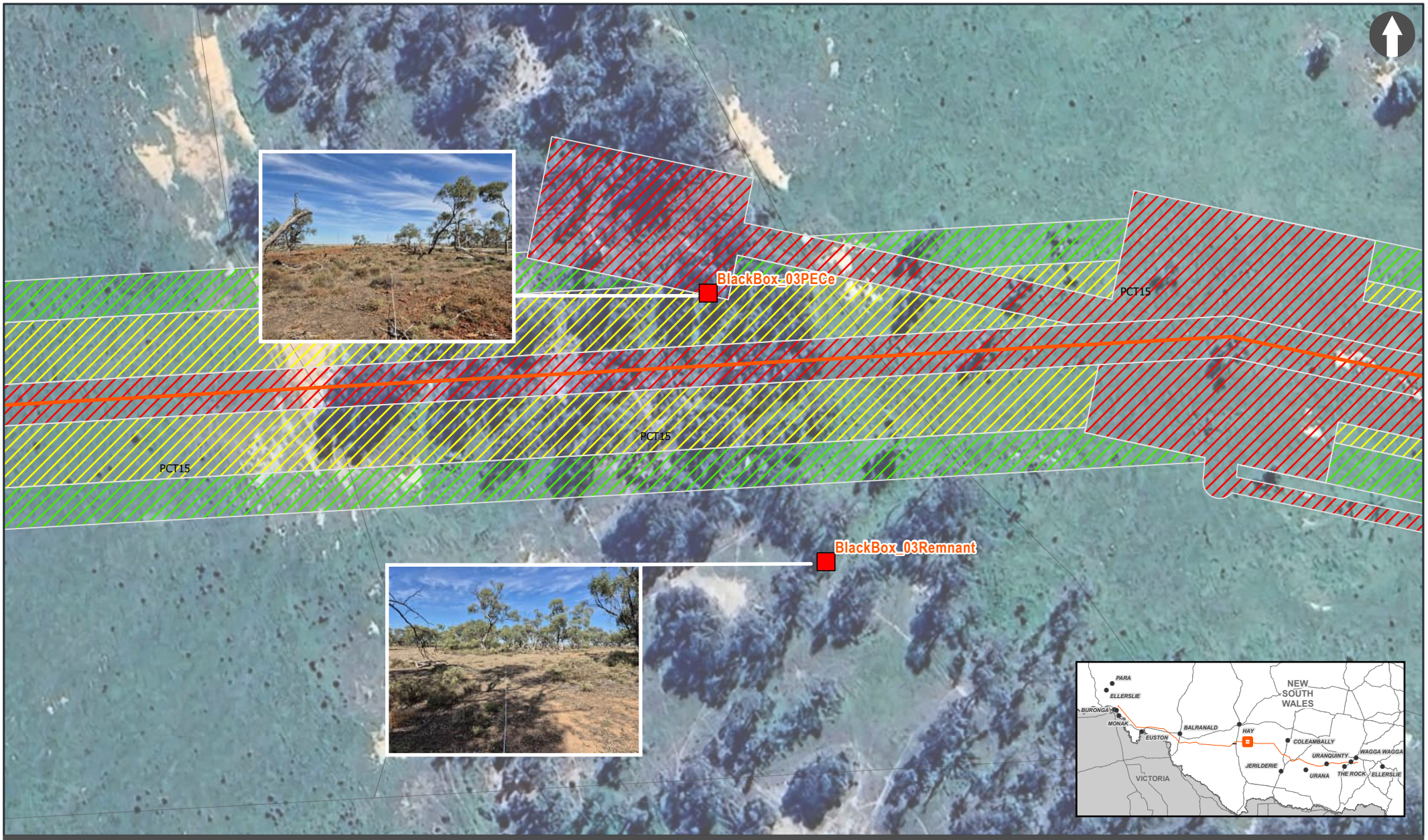
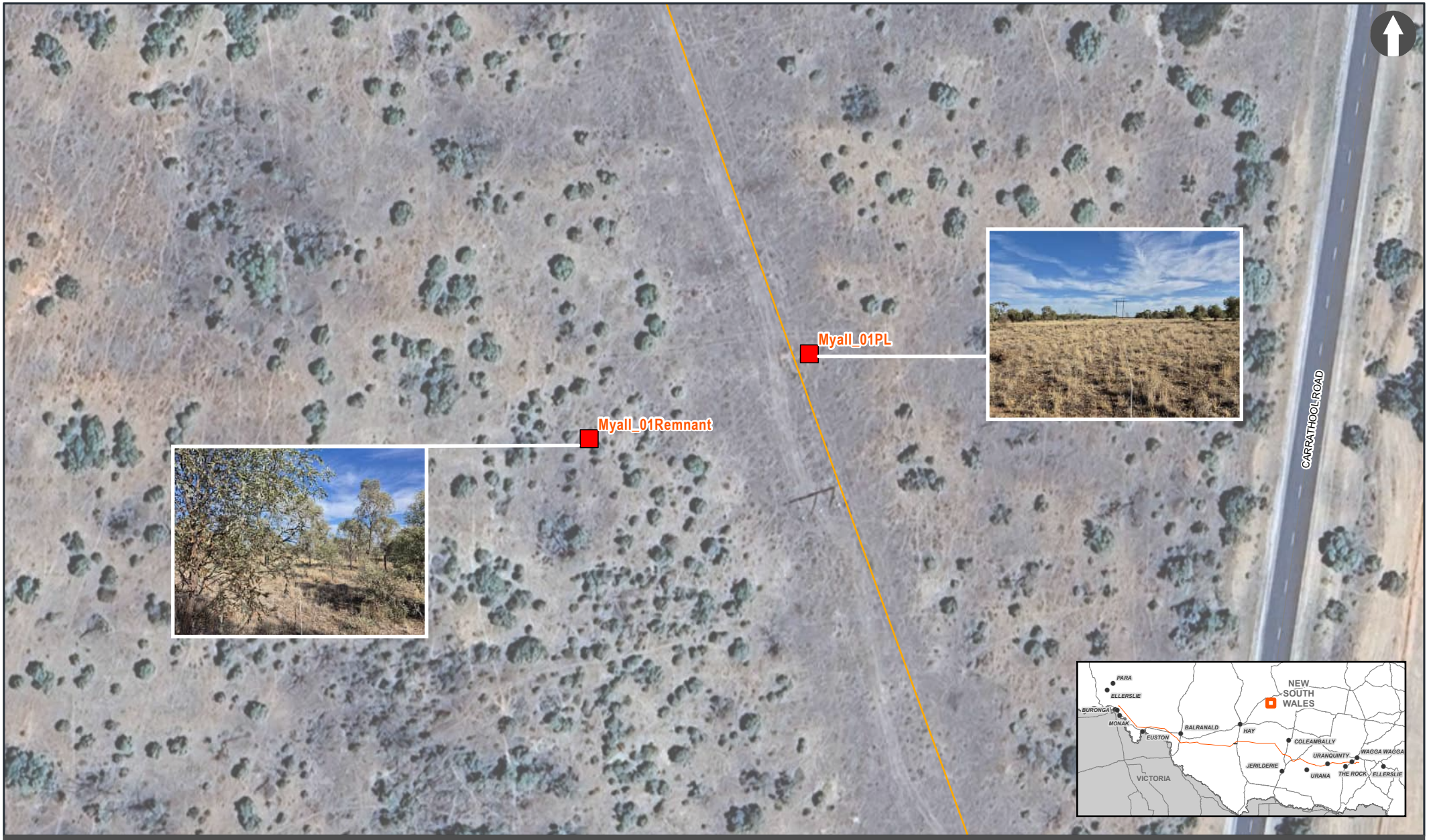


Figure 3.1 - Partial Impact Survey Locations



0 25 50 Meters

PECe Post-approval survey

Plot reference

Electricity Transmission

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Source: NSWSS, ESRI, Transgrid, WSP



PECe Post-approval survey

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EnergyConnect Alignment

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Source: NSWSS, ESRI, Transgrid, WSP



Figure 3.1 - Partial Impact Survey Locations



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Source: NSWSS, ESRI, Transgrid, WSP



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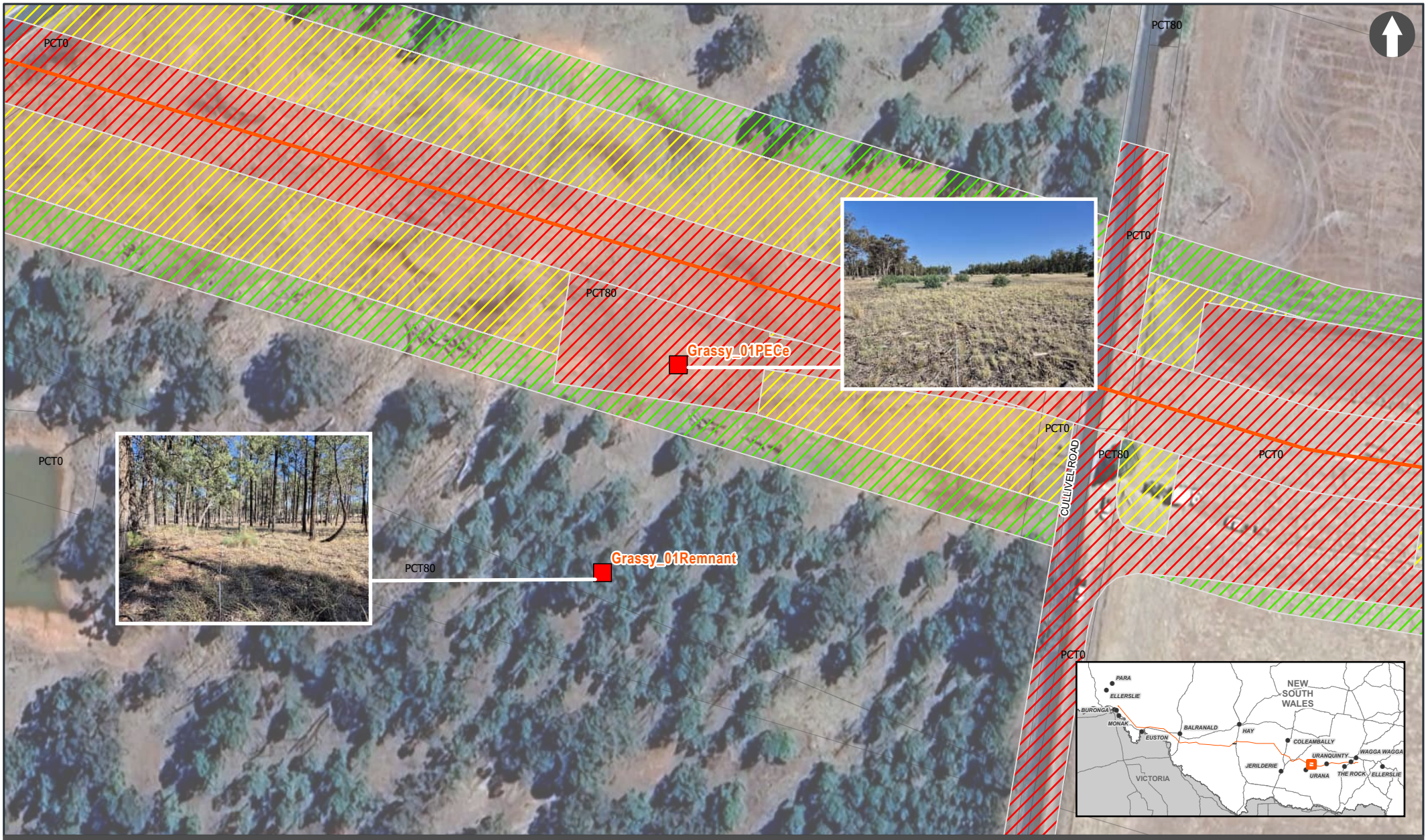
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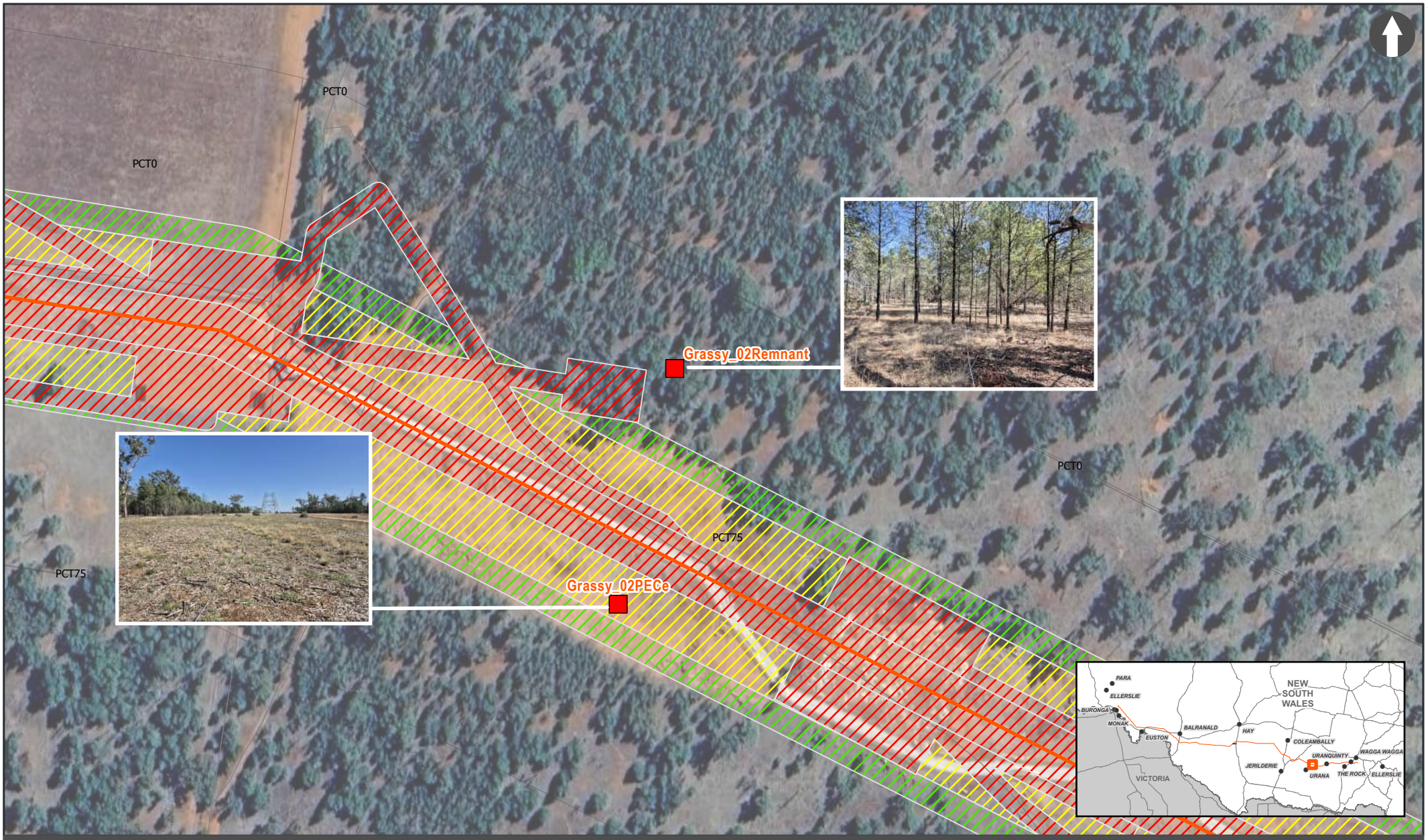
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Source: NSWSS, ESRI, Transgrid, WSP



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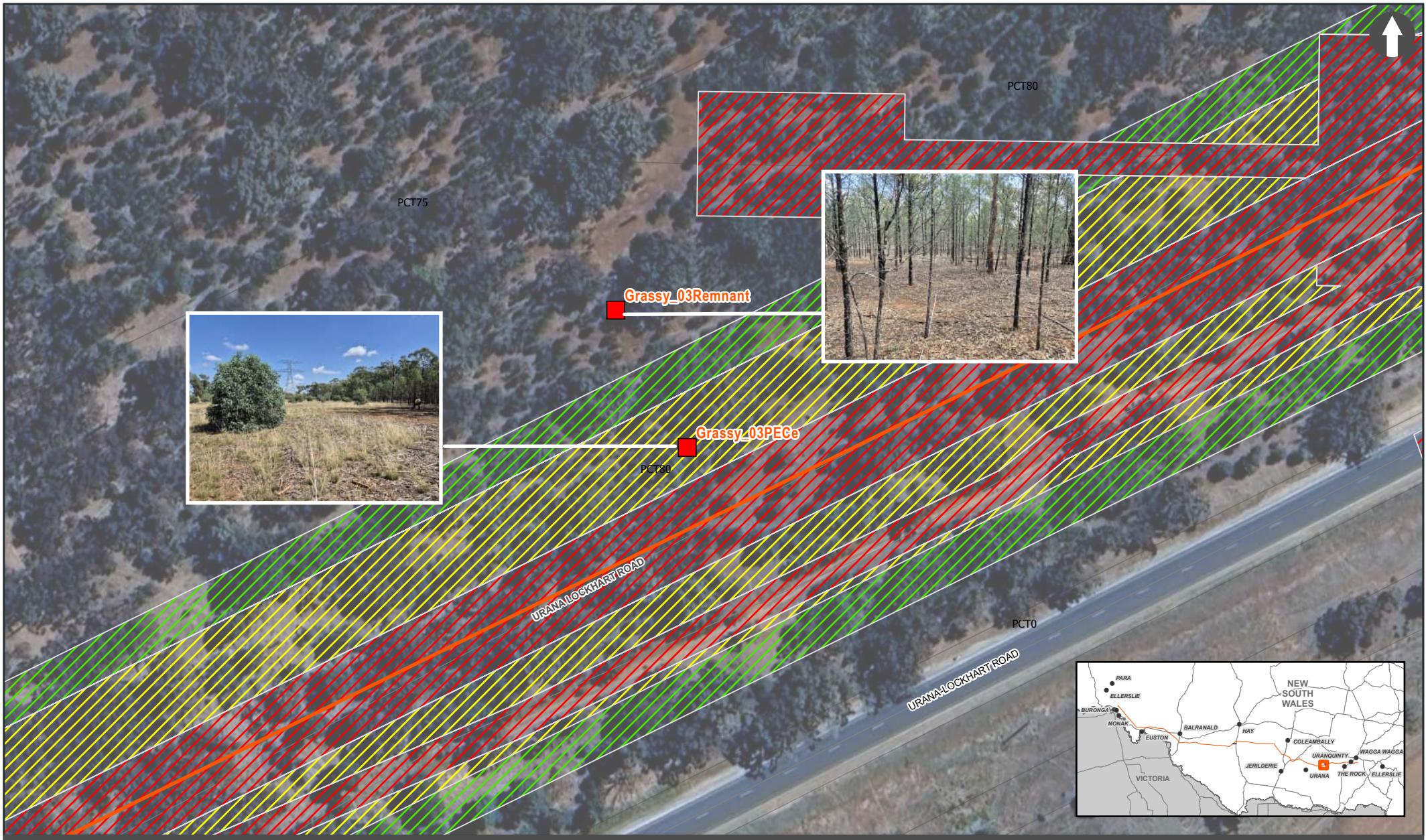
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Source: NSWSS, ESRI, Transgrid, WSP



Figure 3.1 - Partial Impact Survey Locations



Plot reference
Field Verified Vegetation
EnergyConnect Alignment

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Source: NSWSS, ESRI, Transgrid, WSP

3.2 Survey methodology

Survey was undertaken by suitability qualified ecologists on 18 – 25 March 2025.

3.2.1 Survey site selection

To ensure the analysis and assessment of partial impacts is suitably conservative, with limited variability, the following rule set was developed and applied to all sample site locations:

- All sampled post-construction plots were collected from areas of impacted Disturbance area B within 24 months of construction clearing occurring
- For historical managed ETLs, samples were restricted to a minimum of 40 m wide management easement (typically of 330 kV or greater kV)
- All areas sampled were from remnant reference site PCTs in moderate-good condition
- All paired sample sites were in the same PCT
- All paired sample sites were generally located <100m apart to avoid microclimate variability
- All paired sample sites were subject to same existing management regimes and disturbances (land use).

3.2.2 Vegetation integrity plot – method

Vegetation integrity plots were completed in accordance with section 4.3.3 of the BAM. A schematic diagram illustrating the layout of each vegetation integrity plot is provided in Figure 3.2.

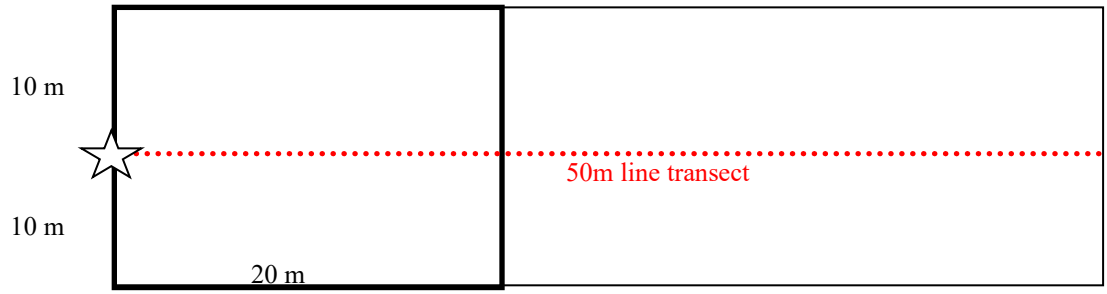


Figure 3.2 Vegetation integrity plot layout

The following site attributes were recorded at each vegetation integrity plot location:

- **Location:** (easting – northing grid type MGA 94, Zone 54 & 55).
- **Vegetation structure and dominant species and vegetation condition:** Vegetation structure was recorded through estimates of percentage foliage cover, average height and height range for each vegetation layer.
- **Native and exotic species richness** (within a 400-metre squared quadrat): This consisted of recording all species by systematically walking through each 20 metre x 20 metre plot. The cover and abundance (percentage of area of quadrat covered) of each species was estimated. The growth form, stratum/layer and whether each species was native/exotic/high threat weed was also recorded.
- **Number of trees with hollows** (1,000 metre squared quadrat): This was the frequency of hollows within living and dead trees within each 50 metre x 20 metre plot. A hollow was only recorded if (a) the entrance could be seen: (b) the estimated entrance width was at least five centimetres across: (c) the hollow appeared to have depth: (d) the hollow was at least one metre above the ground and the centre of the tree was located within the sampled quadrat.

- **Number of large trees and stem size diversity** (1,000 metre squared quadrat): tree stem size diversity was calculated by measuring the diameter at breast height (DBH) (i.e. 1.3 metre from the ground) of all living trees (greater than five centimetre DBH) within each 50 metre x 20 metre plot. For multi-stemmed living trees, only the largest stem was included in the count. Number of large trees was determined by comparing living tree stem DBH against the PCTs benchmarks.
- **Total length of fallen logs** (1,000 metre squared quadrat): This was the cumulative total of logs within each 50 metre x 20 metre plot with a diameter of at least 10 centimetres and a length of at least 0.5 metre.
- **Litter cover:** This comprised estimating the average percentage groundcover of litter (i.e. leaves, seeds, twigs, branchlets and branches with a diameter less than 10 centimetre which is detached from a living plant) from within five 1 metre x 1 metre sub-plots spaced evenly either side of the 50-metre central transect.
- **Evaluation of regeneration:** This was estimated as the presence/absence of overstorey species present at the site that was regenerating (i.e. saplings with a diameter at breast height less than or equal to five centimetres).

Prior to establishing plot survey locations, vegetation stratification was undertaken to provide a representative vegetation zone for sampling. Stratification involved marking waypoints and bearings randomly to provide a representative assessment of the vegetation integrity of the vegetation zone in the subject land and establishing the required number of plots at some of these waypoints.

Where a regularly sized 50 x 20 m plot could not be fit into vegetation due to size constraints (e.g. narrow partial clearing zone) the plot size and shape was modified in shape keeping the required area of the quadrats (1,000 metre squared quadrat and nested 400-metre squared quadrat) intact. This was only done where the shape of the vegetation would not allow the use of a 50 x 20 m plot.

3.2.3 Vegetation integrity score calculations

As outlined in BAM Section 4.3.3, vegetation integrity is a metric-based assessment used to measure the condition of native vegetation against a benchmark, based on survey data collected by the assessor. Within each vegetation zone in the subject land, a quantitative measure of the composition, structure and function attributes is obtained from the survey. The composition, structure and relevant function attributes for each vegetation zone are then assessed against the benchmark data for the relevant PCT.

The default benchmarks for PCTs held within the BAM-C were not modified.

The plot survey data was used to determine the vegetation integrity scores for a vegetation zone. Equations 16–24 from Appendix H of the BAM (housed within the BAM-C) were used to determine the current vegetation integrity score for each vegetation zone within the partial impact and adjoining remnant control.

The vegetation integrity loss was calculated as the difference between the vegetation integrity of the two condition states.

To further account for the influences of external variables on VI between the BDAR and post-construction data, the assessment also compared percentage loss changes in VI between those predicted within the BDAR and post-construction data with adjoining control sites (paired plots).

3.2.4 Survey and data limitations

Survey access for existing ETLs is challenging and subject to landholder restrictions. Therefore, the partial impact surveys were restricted to the current project and available relevant ETLs for previously constructed and managed Transgrid ETLs.

The condition of ETLs significantly influences the measurable change to PCT condition. Where existing disturbances are high, interpreting changes in attribute data is limited (pasture improvement, substantial grazing with high weed cover and low native diversity). Therefore, to provide a conservative assessment of the partial impacts, all sample sites were located within moderate to good condition vegetation.

Where existing management regimes (grazing) were observed and could not be avoided, sample sites were located in areas under the same level of management to ensure any observed VI changes were representative of the ETL easement management influences.

4. Field survey results

4.1 Semi-arid Woodlands (Grassy sub-formation)

Summary data for paired BAM VI plots for dominant PCTs (15 and 26) within the Semi-arid Woodlands (Grassy sub-formation) is provided below in Table 4.1.

A comparative analysis of observed differences in sampled cover and composition attributes between the sampled remnant (control site) and adjoining ETLs managed for a partial impact (Post construction Disturbance area B) is provided in Figure 4.1 and Figure 4.2.

Photographs of indicative sample sites are provided in Photo 4.1 - Photo 4.4.



Photo 4.1 *PCT 15 – Remnant vegetation in moderate-good condition (BlackBox_02Remnant)*



Photo 4.2 *PCT 15 - Post construction Disturbance area B (BlackBox_02PECe)*



Photo 4.3 *PCT 26 – Remnant vegetation in moderate-good condition (Myall_02Remnant)*



Photo 4.4 *PCT 26 – Post construction Disturbance Area B (Myall_02PECe)*

Table 4.1 Summary average composition and structure data of sampled PCTs within the Semi-arid Woodlands (Grassy sub-formation) within the ETL and adjoining remnant areas

Semi-arid Woodlands (Grassy sub-formation)	Composition data - Species Richness									Structure data - Percentage Cover								
	Native	Trees	Shrubs	Grass	Forbs	Fern	Other	Exotic	High threat weed	Native	Trees	Shrubs	Grass	Forbs	Fern	Other	Exotic	High threat weed
PCT 15 – Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)																		
Average Remnant	11.3	1.0	7.3	0.7	2.3	0.0	0.0	1.7	1.3	29.5	6.7	17.5	0.1	5.2	0.0	0.0	1.3	1.2
Average Partial Impact	11.7	1.0	8.7	0.0	2.0	0.0	0.0	0.7	0.7	27.6	1.7	18.9	0.0	7.0	0.0	0.0	3.4	3.4
PCT 26 – Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion																		
Average Remnant	18.7	1.0	7.3	4.3	5.7	0.0	0.3	1.0	0.7	33.6	5.7	16.0	4.1	7.6	0.0	0.3	0.1	0.1
Average Partial Impact	21.3	1.0	8.3	4.0	7.3	0.3	0.3	0.3	0.0	33.5	5.7	12.3	7.3	7.0	0.0	1.3	0.0	0.0

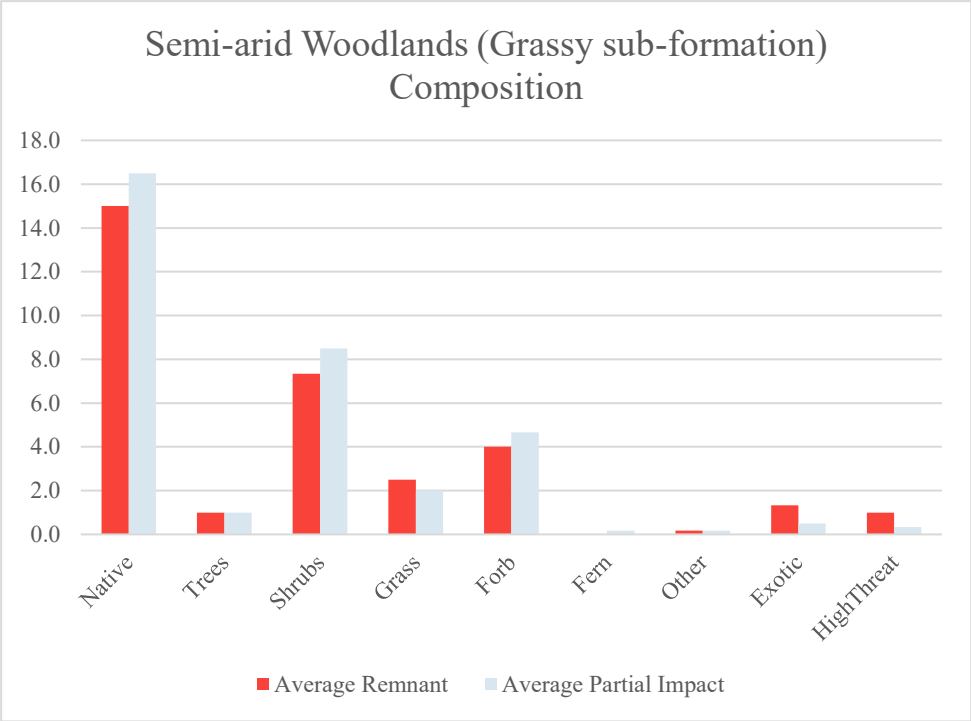


Figure 4.1 Semi-arid Woodlands (Grassy sub-formation) average composition data within the ETL and adjoining remnant vegetation

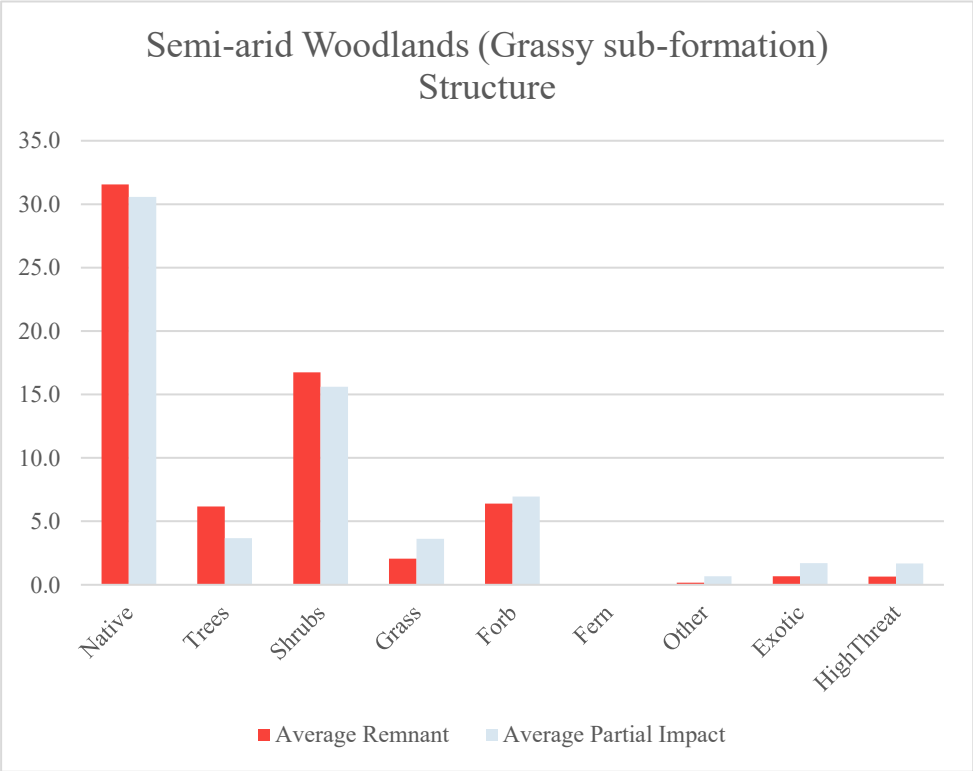


Figure 4.2 Semi-arid Woodlands (Grassy sub-formation) average structure data within the ETL and adjoining remnant vegetation

4.1.1 Key trends for Semi-arid Woodlands (Grassy sub-formation) attribute scores

The following general trends were observed for the Semi-arid Woodlands (Grassy sub-formation) between the post-construction disturbance area B and adjoining remnant vegetation areas:

- tree composition remained consistent,
- there were no drastic changes to vegetation composition or structure within the post-construction plots,
- no significant change in composition of total native species, however, a slight decrease in native vegetation structure is present, and
- there was an increase in exotic species composition, however there was an observed decrease in exotic species cover

4.1.2 Changes in vegetation integrity for Semi-arid Woodlands (Grassy sub-formation)

A summary of VI data within the Semi-arid Woodlands (Grassy sub-formation) following BAM-C calculations is provided in Table 4.2.

A comparative analysis of observed differences in vegetation integrity values within the ETL, adjoining remnant vegetation and the approved BDAR is provided in Table 4.2 and Figure 4.3.

Table 4.2 VI data of the Semi-arid Woodlands (Grassy sub-formation) within the ETL, adjoining remnant vegetation and corresponding predicted VI in the approved BDAR.

Vegetation Formation	Condition	Composition Condition Score	Structure Condition Score	Function Condition Score	VI Score	Change in VI %
Semi-arid Woodlands (Grassy sub-formation)	Average Remnant	66.7	78.4	71.3	71.3	n/a
	Average Partial impact	69.3	78.0	47.3	63.3	n/a
	Post Construction VI Loss				**-8.1**	**11.3**
	BDAR Average partial impact VI				45.6	n/a
	BDAR Average Predicted VI loss				**-32.2**	**58.6**

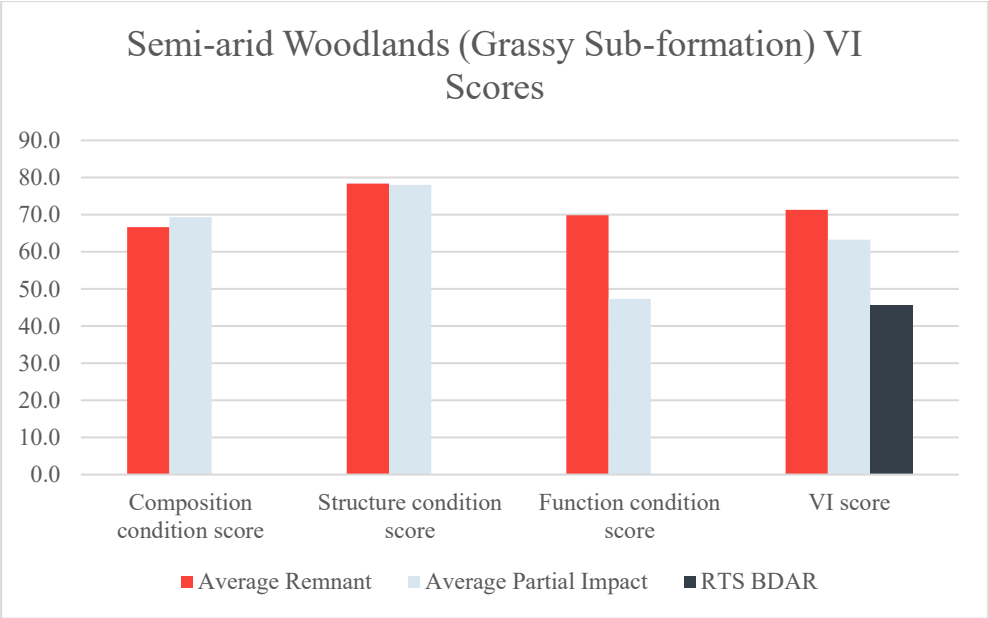


Figure 4.3 Semi-arid Woodlands (Grassy sub-formation) average change in vegetation integrity values within the ETL partial clearing zone, adjoining remnant vegetation and the approved BDAR.

4.1.3 Key trends and findings for Semi-arid Woodlands (Grassy sub-formation) vegetation integrity (VI)

Following analysis of the data the following general trends were observed for the Semi-arid Woodlands (Grassy sub-formation) sample sites between the management of ETL and adjoining remnant vegetation areas:

- the average change to composition and structure component of VI is a minimal with a 4.0% increase and a 0.5% decrease observed respectively,
- the greatest change to VI is attributed to the decreases in function condition score (33.6%), and
- the overall change in post-construction VI loss (11.3%) is less than the approved BDAR (58.6%).

4.2 Semi-arid Woodlands (Shrubby sub-formation)

Summary data for paired BAM VI plots for each affected PCT (i.e. those with a max growth height >4 metres) within the Semi-arid Woodlands (Shrubby sub-formation) is provided below in Table 4.3.

A comparative analysis of observed differences in sampled cover and composition attributes between the sampled remnant and adjoining ETL managed for a partial impact is provided in Figure 4.4 and Figure 4.5.

Photographs of indicative sample sites are provided in Photo 4.5 - Photo 4.18.



Photo 4.5 *PCT 22 – Remnant vegetation in moderate-good condition (Pine_01Remnant)*



Photo 4.6 *PCT 22 - Post construction Disturbance area B (Pine_01PECe)*



Photo 4.7 *PCT 28 – Remnant vegetation in moderate-good condition (Pine_03Remnant)*



Photo 4.8 *PCT 28 - Post construction Disturbance area B (Pine_03PECe)*



Photo 4.9 *PCT 58 – Remnant vegetation in moderate-good condition (BlackOak_02Remnant)*



Photo 4.10 *PCT 58 - Post construction Disturbance area B (BlackOak_02PECe)*



Photo 4.11 PCT 75 – Remnant vegetation in moderate-good condition (Grassy_02Remnant)



Photo 4.12 PCT 75 - Post construction Disturbance area B (Grassy_02PECe)



Photo 4.13 PCT 170 – Remnant vegetation in moderate-good condition (BlackBox_02Remnant)



Photo 4.14 PCT 170 - Post construction Disturbance area B (Mallee_02PECe)



Photo 4.15 PCT 171 – Remnant vegetation in moderate-good condition (Mallee_03Remnant)



Photo 4.16 PCT 171 - Post construction Disturbance area B (Mallee_03PECe)



Photo 4.17 PCT 172 – Remnant vegetation in moderate-good condition (Mallee_01Remnant)



Photo 4.18 PCT 172 - Post construction Disturbance area B (Mallee_01PECe)

Table 4.3 Summary data of the sampled PCTs within the Semi-arid Woodlands (Shrubby sub-formation) within the ETL and adjoining remnant vegetation

Semi-arid Woodlands (Shrubby sub-formation)	Composition data - Species Richness									Structure data - Percentage Cover								
	Native	Trees	Shrubs	Grass	Forbs	Fern	Other	Exotic	HT	Native	Trees	Shrubs	Grass	Forbs	Fern	Other	Exotic	HT
PCT 22 - Semi-arid shrubby Buloke - Slender Cypress Pine Woodland, far south-western NSW																		
Average Remnant	12.0	1.0	4.0	4.0	2.0	0.0	1.0	3.0	1.0	83.4	1.0	4.1	78.0	0.2	0.0	0.1	2.8	1.0
Average Partial Impact	13.0	0.0	5.0	5.0	2.0	0.0	1.0	2.0	0.0	80.6	0.0	3.3	77.0	0.2	0.0	0.1	0.2	0.0
PCT 28 - White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone																		
Average Remnant	6.5	1.0	2.0	2.5	1.0	0.0	0.0	7.0	2.0	14.7	2.0	0.9	11.8	0.1	0.0	0.0	3.8	1.7
Average Partial Impact	4.5	0.5	1.0	1.5	1.5	0.0	0.0	3.0	0.0	15.3	2.0	0.2	12.5	0.6	0.0	0.0	1.3	0.0
PCT 58 - Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion																		
Average Remnant	17.3	1.3	11.3	1.7	2.3	0.0	0.7	0.7	0.7	20.6	4.0	15.5	0.2	0.3	0.0	0.5	0.1	0.1
Average Partial Impact	18.0	1.7	12.3	1.3	2.7	0.0	0.0	1.3	1.0	13.4	1.5	11.5	0.1	0.3	0.0	0.0	0.8	0.7
PCT 75 - Yellow Box - White Cypress Pine grassy woodland on deep sandy-loam alluvial soils of the eastern Riverina Bioregion and western NSW South Western Slopes Bioregion																		
Average Remnant	19.0	3.0	2.0	7.0	5.5	1.0	0.5	0.0	0.0	38.5	18.0	0.9	18.1	1.4	0.1	0.1	0.0	0.0
Average Partial Impact	21.5	2.5	2.5	7.0	8.0	1.0	0.5	7.0	0.0	18.2	0.4	0.3	14.3	3.0	0.2	0.1	1.5	0.0
PCT 170 - Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones																		
Average Remnant	23.0	3.0	16.0	2.0	2.0	0.0	0.0	0.0	0.0	21.3	7.0	11.1	1.1	2.1	0.0	0.0	0.0	0.0
Average Partial Impact	20.0	2.0	12.0	3.0	3.0	0.0	0.0	1.0	1.0	8.0	1.2	5.8	0.3	0.7	0.0	0.0	0.1	0.1
PCT 171 - Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion																		
Average Remnant	14.0	5.0	4.0	4.0	1.0	0.0	0.0	0.0	0.0	31.0	10.0	0.5	20.4	0.1	0.0	0.0	0.0	0.0
Average Partial Impact	16.0	5.0	6.0	4.0	1.0	0.0	0.0	0.0	0.0	19.4	8.0	0.9	10.4	0.1	0.0	0.0	0.0	0.0

Semi-arid Woodlands (Shrubby sub-formation)	Composition data - Species Richness									Structure data - Percentage Cover								
	Native	Trees	Shrubs	Grass	Forbs	Fern	Other	Exotic	HT	Native	Trees	Shrubs	Grass	Forbs	Fern	Other	Exotic	HT
PCT 172 - Deep sand mallee of irregular dunefields of the semi-arid (warm) zone																		
Average Remnant	15.0	5.0	6.0	3.0	1.0	0.0	0.0	0.0	0.0	23.6	20.0	3.1	0.4	0.1	0.0	0.0	0.0	0.0
Average Partial Impact	15.0	4.0	4.0	4.0	3.0	0.0	0.0	0.0	0.0	32.6	19.0	0.9	12.3	0.4	0.0	0.0	0.0	0.0

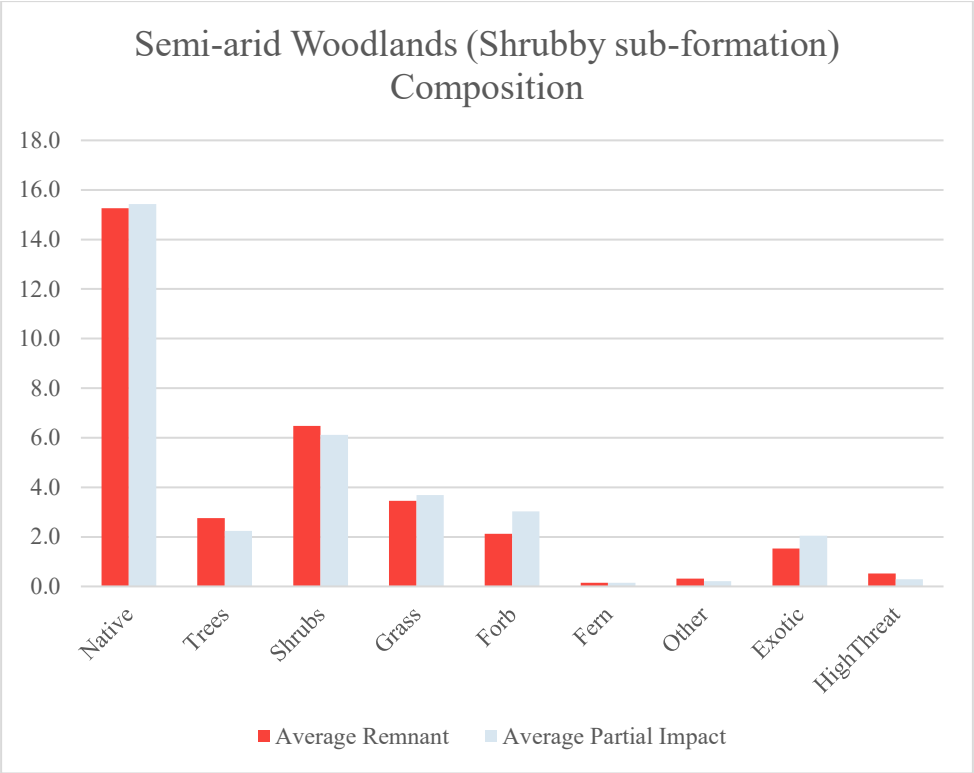


Figure 4.4 Semi-arid Woodlands (Shrubby sub-formation) average composition data within the ETL and adjoining remnant vegetation

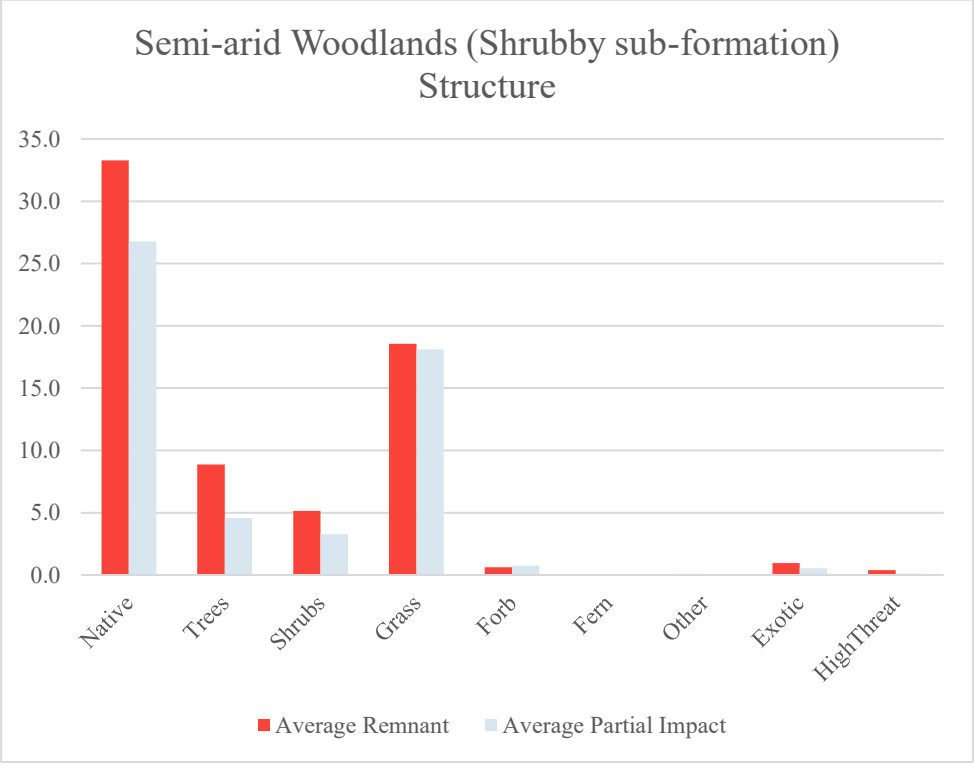


Figure 4.5 Semi-arid Woodlands (Shrubby sub-formation) average structure data within the ETL and adjoining remnant vegetation)

4.2.1 Key trends and findings for Semi-arid Woodlands (Shrubby sub-formation) attribute scores

Following analysis of the data the following general trends were observed for the Semi-arid Woodlands (Shrubby sub-formation) sample sites between the management of ETL and adjoining remnant vegetation areas:

- tree composition decreased slightly,
- there was an increase in both grass and forb composition, while shrub composition and structure slightly decreased,
- native vegetation composition increased slightly, while native vegetation structure, and
- exotic composition increased but neither weed or high threat weed cover increased.

4.2.2 Changes in vegetation integrity for Semi-arid Woodlands (Shrubby sub-formation)

The summary vegetation integrity data of each of the PCTs within the Semi-arid Woodlands (Shrubby sub-formation) following BAM-C calculation is provided below in Table 4.4.

A comparative analysis of observed differences in vegetation integrity values within the ETL partial impact, adjoining remnant vegetation and the approved BDAR is provided in Table 4.4 and Figure 4.6.

Table 4.4 Summary vegetation integrity data of the sampled PCTs within the Semi-arid Woodlands (Shrubby sub-formation) within the ETL, adjoining remnant vegetation and corresponding predicted VI in the approved BDAR.

Vegetation Formation	Condition	Composition Condition Score	Structure Condition Score	Function Condition Score	VI Score	Change in %
Semi-arid Woodlands (Shrubby sub-formation	Average Remnant	70.4	60.7	44.1	55.1	n/a
	Average partial impact	68.8	54.0	30.6	42.6	n/a
	Post Construction VI Loss				**-12.6**	**22.8**
	BDAR Average partial impact VI				40.9	n/a
	BDAR Average Predicted VI loss				**-35.3**	**46.3**

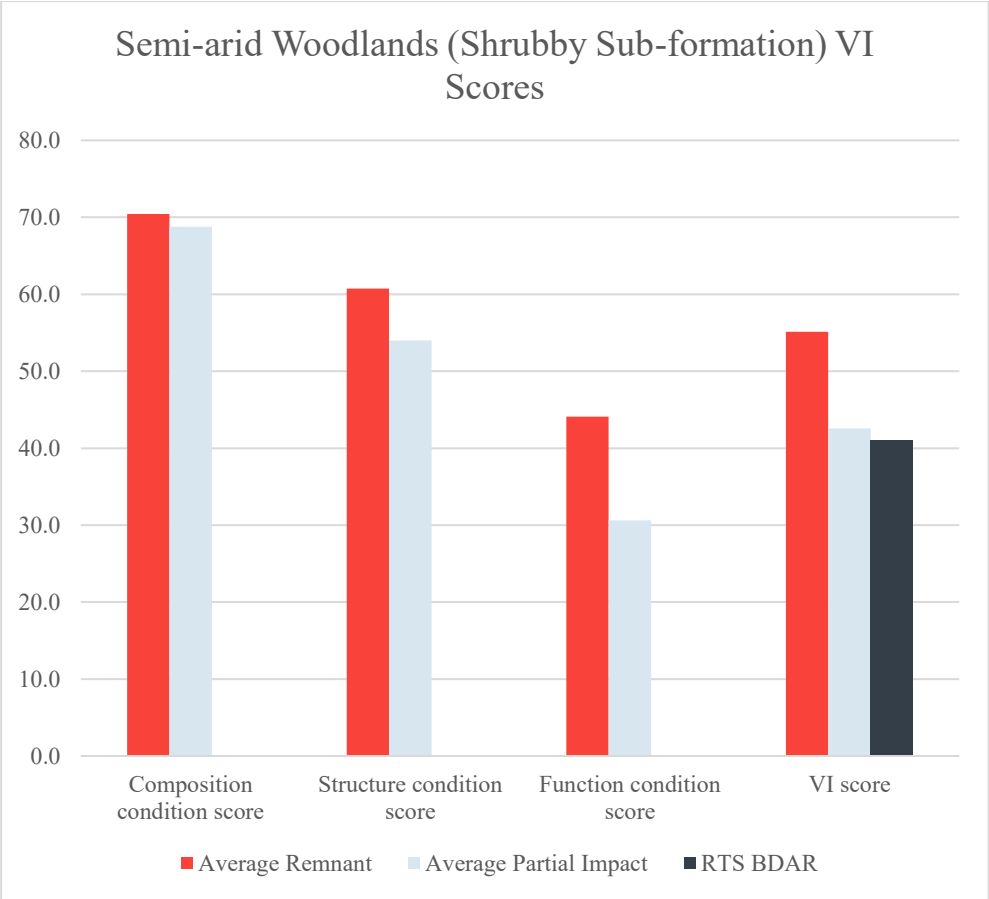


Figure 4.6 Semi-arid Woodlands (Shrubby sub-formation) average change in vegetation integrity values within the ETL partial clearing zone, adjoining remnant vegetation and approved BDAR.

4.2.3 Key trends and findings for Semi-arid Woodlands (Shrubby sub-formation) integrity (VI)

Following analysis of the data the following general trends were observed for the Semi-arid Woodlands (Shrubby sub-formation) sample sites between the management of ETL and adjoining remnant vegetation areas:

- the average change to the composition component of VI is minimal (3.4% decrease),
- the greatest change to VI is attributed to the decrease in function condition score (69.3%), and
- the overall change in post-construction VI loss (22.8%) is less than the predicted approved BDAR (46.3%).

4.3 Grassy Woodlands

Summary data of the paired BAM plots for the dominant PCT (80) within the Grassy Woodlands formation is provided below in Table 4.5.

A comparative analysis of observed differences in sampled cover and composition attributes between the sampled remnant and adjoining ETL managed for a partial impact is provided in Figure 4.7 and Figure 4.8.

Photographs of indicative sample sites are provided in Photo 4.19 and Photo 4.20.



Photo 4.19 PCT 80 – Remnant vegetation in moderate-good condition (Grassy_01Remnant)



Photo 4.20 PCT 80 - Post construction Disturbance area B (Grassy_01PECe)

Table 4.5 Summary data of the sampled PCTs within the Grassy Woodland within the ETL and adjoining remnant vegetation

Grassy Woodlands	Composition data - Species Richness									Structure data - Percentage Cover								
	Native	Trees	Shrubs	Grass	Forbs	Fern	Other	Exotic	High threat weed	Native	Trees	Shrubs	Grass	Forbs	Fern	Other	Exotic	High threat weed
PCT 80 – Western Grey Box – White Cypress Pine tall woodland on loam soil on alluvial plains of NSW South Western Slopes Bioregion and Riverina Bioregion																		
Average Remnant	20.5	3.0	2.5	6.5	7.5	1.0	0.0	0.5	0.5	49.5	38.1	1.8	6.0	3.6	0.1	0.0	0.1	0.1
Average Partial Impact	21.5	1.0	1.5	10.0	8.5	0.5	0.0	6.5	0.0	31.5	2.0	0.6	27.1	1.8	0.1	0.0	1.2	0.0

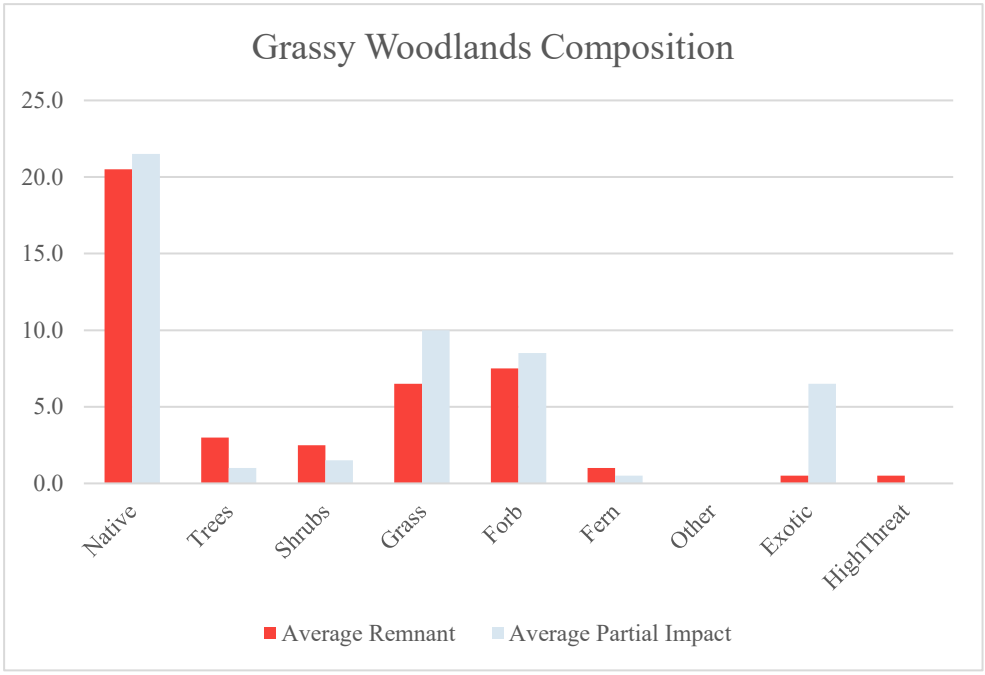


Figure 4.7 Grassy Woodlands average composition data within the ETL and adjoining remnant vegetation

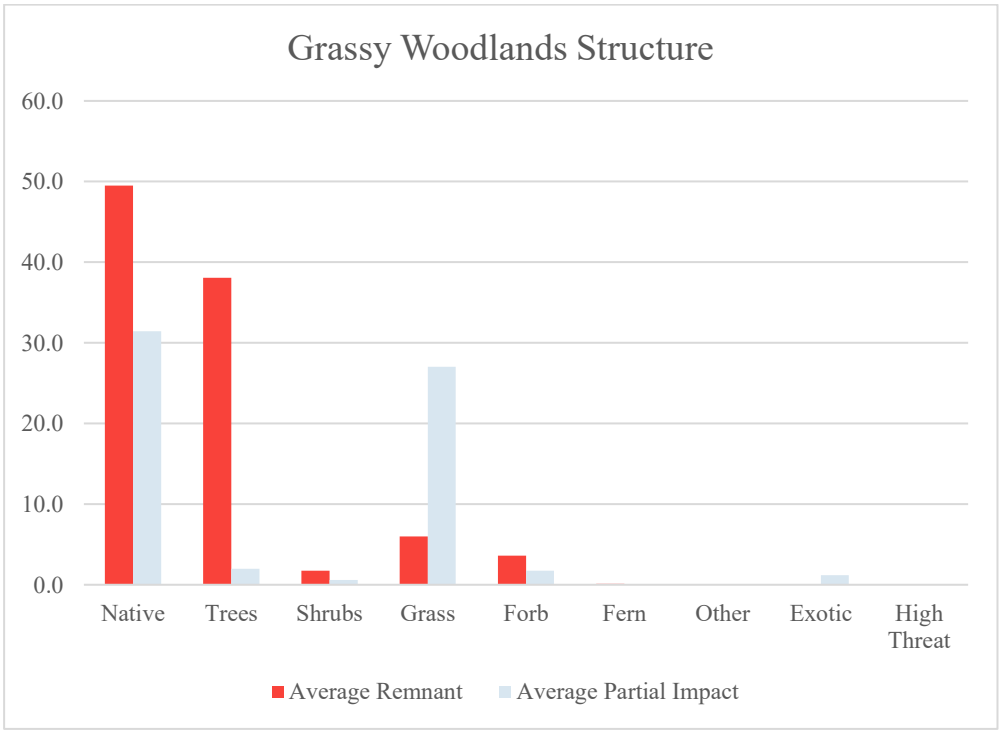


Figure 4.8 Grassy Woodlands average structure data within the ETL and adjoining remnant vegetation

4.3.1 Key trends and findings for Grassy Woodlands attribute scores

Following analysis of the data the following general trends were observed for Grassy Woodlands sample sites between the management of ETL and adjoining remnant vegetation areas:

- the greatest change was associated with a significant increase in grass structure,
- a strong relationship between a decrease in canopy cover and increase in grass cover is established,
- an increase in native, grass and forb composition occurred, despite a decrease in native and forb structure, and
- an increase in exotic cover and composition occurred following construction.

4.3.2 Changes in vegetation integrity for Grassy Woodlands

The summary vegetation integrity data of each of the PCTs within Grassy Woodlands following BAM-C calculation is provided below in Table 4.6.

A comparative analysis of observed differences in vegetation integrity values within the ETL partial impact, adjoining remnant vegetation and the approved BDAR is provided in Table 4.6 and Figure 4.9.

Table 4.6 VI data of the sampled PCTs within the Grassy woodlands formation within the ETL, adjoining remnant vegetation and corresponding predicted VI in the approved BDAR

Vegetation Formation	**Condition**	**Composition Condition Score**	**Structure Condition Score**	**Function Condition Score**	**VI Score**	**Change in %**
Grassy Woodlands	Average Remnant	89.4	67.4	46.2	65.3	n/a
	Average partial impact	74.1	41.2	24.1	41.9	n/a
	Post Construction VI Loss				**-23.4**	**35.8**
	BDAR Average partial impact VI				29.8	n/a
	BDAR Average Predicted VI loss				**-58.1**	**66.1**

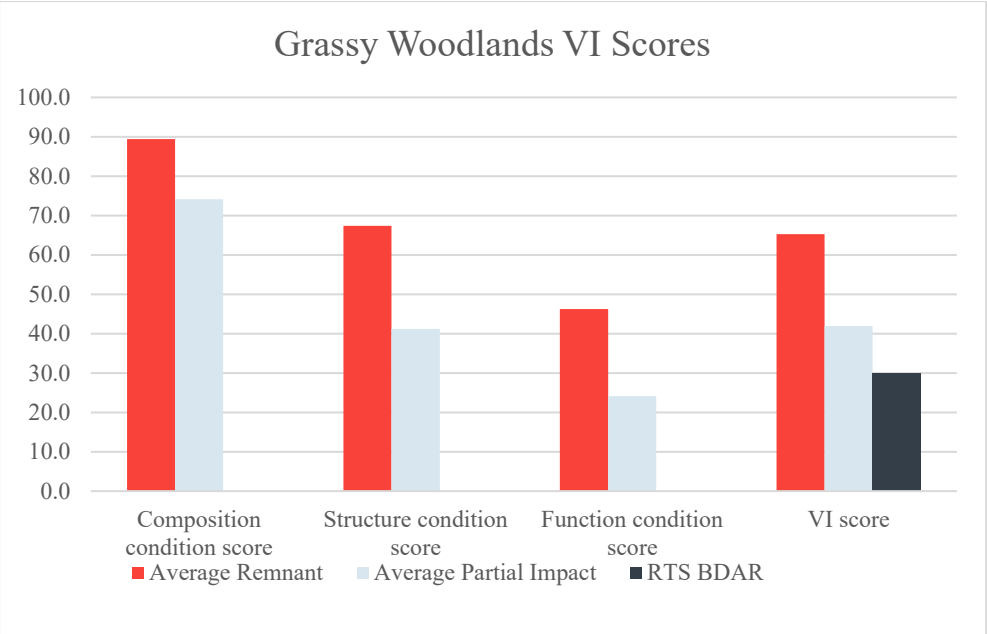


Figure 4.9 Grassy Woodlands average change in vegetation integrity values within the ETL partial clearing zone, adjoining remnant vegetation and approved BDAR.

4.3.3 Key trends and findings for Grassy Woodlands integrity (VI)

Following analysis of the data the following general trends were observed for the Grassy Woodlands sample sites between the management of ETL and adjoining remnant vegetation areas:

- a decrease in VI has been recorded in all condition score categories, and
- the overall change in post-construction VI loss (35.8%) is less than the approved BDAR (66.1%).

4.4 Forested Wetlands

Summary data of the paired BAM plots for a representative sample of PCTs (8 and 11) within Forested Wetlands is provided below in Table 4.7.

A comparative analysis of observed differences in sampled cover and composition attributes between the sampled remnant and adjoining ETL managed for a partial impact is provided in Figure 4.10 and Figure 4.11.

Photographs of indicative sample sites are provided in Photo 4.21 - Photo 4.24.



Photo 4.21 PCT 8 – Remnant vegetation in moderate-good condition (RedGum_02Remnant).



Photo 4.22 PCT 8 - Post construction Disturbance area B (RedGum_02PECe). Note – additional canopy species removal required following sampling.



Photo 4.23 PCT 11 – Remnant vegetation in moderate-good condition (RedGum_03Remnant).



Photo 4.24 PCT 11 - Post construction Disturbance area B (RedGum_03PECe). Note – additional canopy species removal required following sampling.

Table 4.7 Summary data of the sampled PCTs within the Forested Wetlands within the ETL and adjoining remnant vegetation

Forested Wetlands	Composition data - Species Richness									Structure data - Percentage Cover								
	Native	Trees	Shrubs	Grass	Forbs	Fern	Other	Exotic	High threat weed	Native	Trees	Shrubs	Grass	Forbs	Fern	Other	Exotic	High threat weed
PCT 8 – River Red Gum – Warrego Grass – Couch Grass riparian tall woodland wetland of the semi-arid (warm) climate zone (Riverina Bioregion and Murray Darling Depression Bioregion)																		
Average Remnant	8.0	1.0	1.0	5.0	0.0	1.0	0.0	2.0	1.0	11.6	10.0	0.1	1.4	0.0	0.1	0.0	0.2	0.1
Average Partial Impact	13.0	2.0	3.0	5.0	3.0	0.0	0.0	2.0	2.0	2.3	1.1	0.3	0.6	0.3	0.0	0.0	0.3	0.3
PCT 11 – River Red Gum – Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)																		
Average Remnant	10.0	1.0	2.0	4.0	3.0	0.0	0.0	0.0	0.0	15.9	15.0	0.2	0.4	0.3	0.0	0.0	0.0	0.0
Average Partial Impact	6.0	0.0	2.0	2.0	2.0	0.0	0.0	1.0	1.0	0.7	0.0	0.2	0.3	0.2	0.0	0.0	0.1	0.1

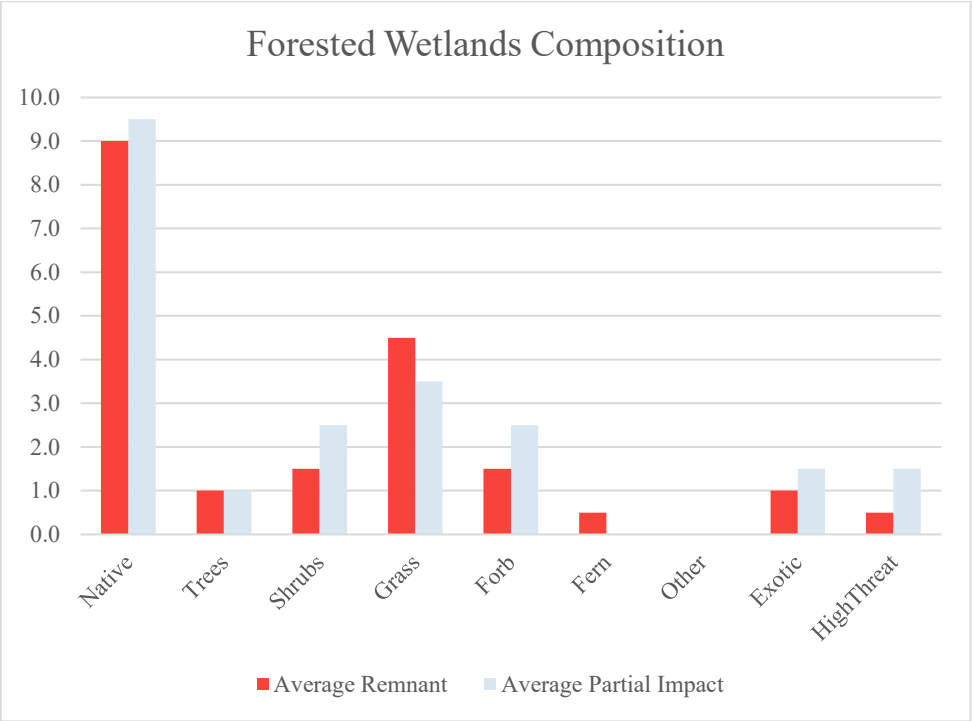


Figure 4.10 Forested Wetlands average composition data within the ETL and adjoining remnant vegetation

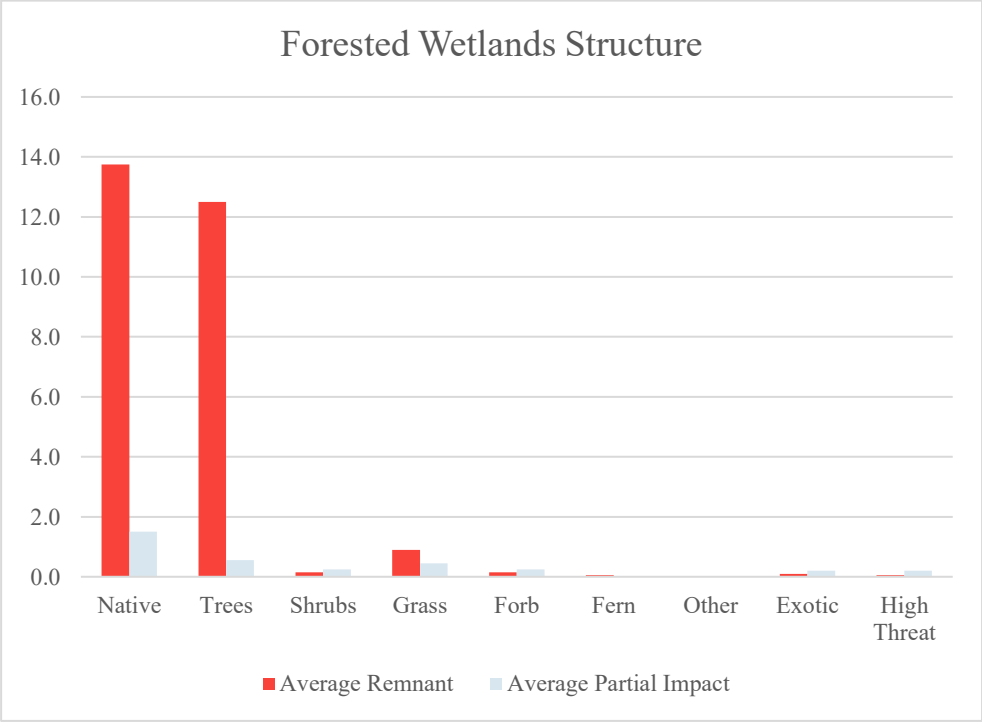


Figure 4.11 Forested Wetlands average structure data within the ETL and adjoining remnant vegetation

4.4.1 Key trends and findings for Forested Wetlands attribute scores

Following analysis of the data the following general trends were observed for Forested Wetlands sample sites between the management of ETL and adjoining remnant vegetation areas:

- the greatest change was associated with a significant decrease in native and tree structure,
- the composition of trees was consistent while grass composition decreased slightly, and shrub and forbs increased slightly, and
- a slight increase in exotic and high threat exotic composition, while exotic and high threat exotic structure remained low for both ETL and adjoining remnant vegetation areas.

4.4.2 Changes in vegetation integrity for Forested Wetlands

The summary vegetation integrity data of each of the PCTs within Forested Wetlands following BAM-C calculation is provided below in Table 4.8.

A comparative analysis of observed differences in vegetation integrity values within the ETL partial impact, adjoining remnant vegetation and the approved BDAR is provided in Table 4.8 and Figure 4.12.

Table 4.8 VI of the sampled PCTs within the Forested Wetlands formation within the ETL, adjoining remnant vegetation and corresponding predicted VI in the approved BDAR.

Vegetation Formation	**Condition**	**Composition Condition Score**	**Structure Condition Score**	**Function Condition Score**	**VI Score**	**Change in %**
Forested Wetlands	Average Remnant	43.7	24.8	41.0	35.1	n/a
	Average partial impact	38.5	0.1	38.3	11.2	n/a
	Post Construction VI Loss				**-23.9**	**68.2**
	BDAR Average partial impact VI				25.3	n/a
	BDAR Average Predicted VI loss				**-46.7**	**64.9**

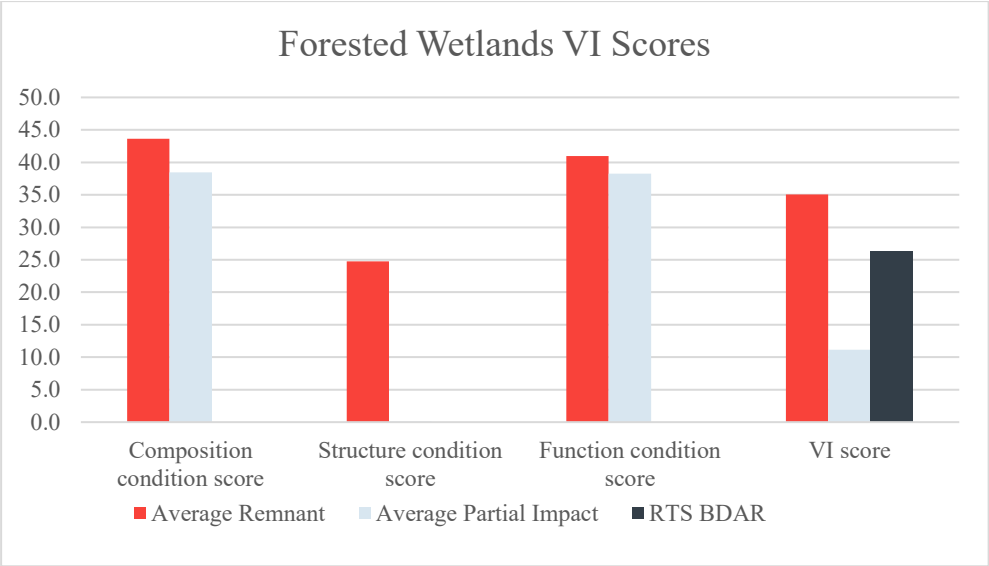


Figure 4.12 Forested Wetlands average change in vegetation integrity values within the ETL partial clearing zone, adjoining remnant vegetation and approved BDAR.

4.4.3 Key trends and findings for Forested Wetlands integrity (VI)

Following analysis of the data the following general trends were observed for the Forested Wetlands sample sites between the management of ETL and adjoining remnant vegetation areas:

- the average changes to composition and structure component to VI is a slight decrease of 11.9% and 6.6% respectively,
- the greatest change to VI is attributed to the decreases in structure condition score, which decreased to 0.1, and
- field sampled post-construction plots showed a greater reduction in VI (68.2%) than the predicted VI reduction in approved BDAR (64.9%).

4.5 Dry Sclerophyll Forests (Shrubby sub-formation)

Summary data of the paired BAM plots for a representative sample of PCTs (110) within the Dry Sclerophyll Forests (Shrubby sub-formation) is provided below in Table 4.9.

A comparative analysis of observed differences in sampled cover and composition attributes between the sampled remnant and adjoining ETL managed for a partial impact is provided in Figure 4.13 and Figure 4.14.

Photographs of indicative sample sites are provided in Photo 4.25 - Photo 4.26.



Photo 4.25 PCT 110 – Remnant vegetation in moderate-good condition (DrySclero_01Remnant)



Photo 4.26 PCT 110 - Post construction Disturbance area B (DrySclero_01PECe)

Table 4.9 Summary data of the sampled PCTs within the Dry Sclerophyll Forests (Shrubby Sub-formation) within the ETL and adjoining remnant vegetation

Dry Sclerophyll Forests (Shrubby Sub-formation)	Composition data - Species Richness									Structure data - Percentage Cover								
	Native	Trees	Shrubs	Grass	Forbs	Fern	Other	Exotic	High threat weed	Native	Trees	Shrubs	Grass	Forbs	Fern	Other	Exotic	High threat weed
PCT110 - Western Grey Box - Cypress Pine shrubby woodland on stony footslopes in the NSW South Western Slopes Bioregion and Riverina Bioregion																		
Average Remnant	16.0	2.0	2.0	7.0	4.0	1.0	0.0	2.0	1.0	58.9	10.1	0.6	47.3	0.5	0.4	0.0	0.3	0.2
Average Partial Impact	18.0	1.0	1.0	9.0	7.0	0.0	0.0	8.0	2.0	7.1	0.5	0.1	4.4	2.1	0.0	0.0	2.0	1.1

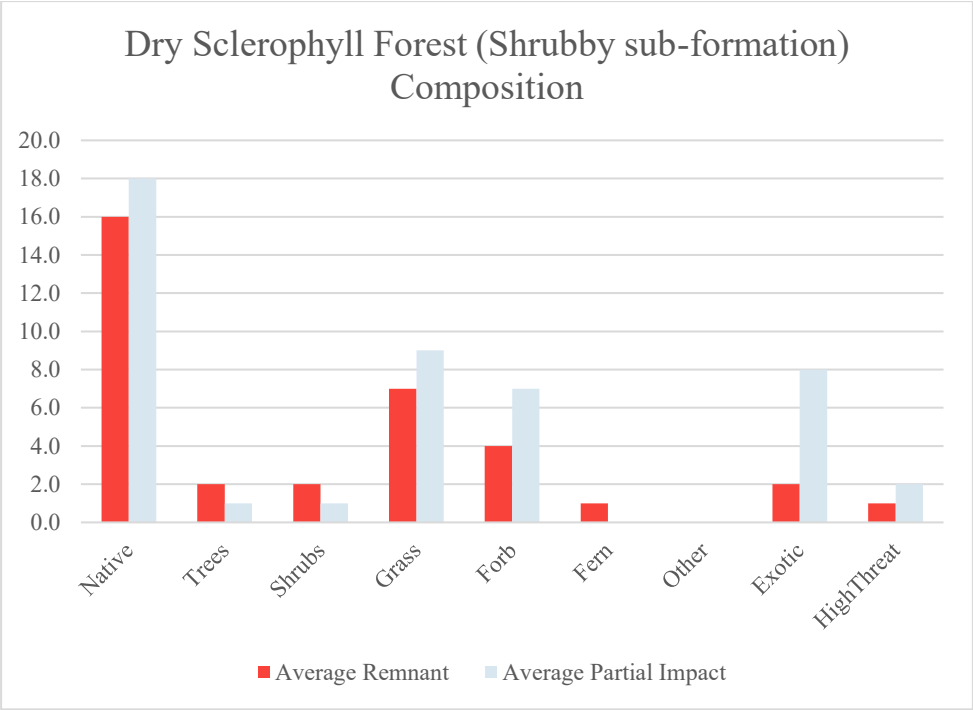


Figure 4.13 Dry Sclerophyll Forest (Shrubby sub-composition) average composition data within the ETL and adjoining remnant vegetation

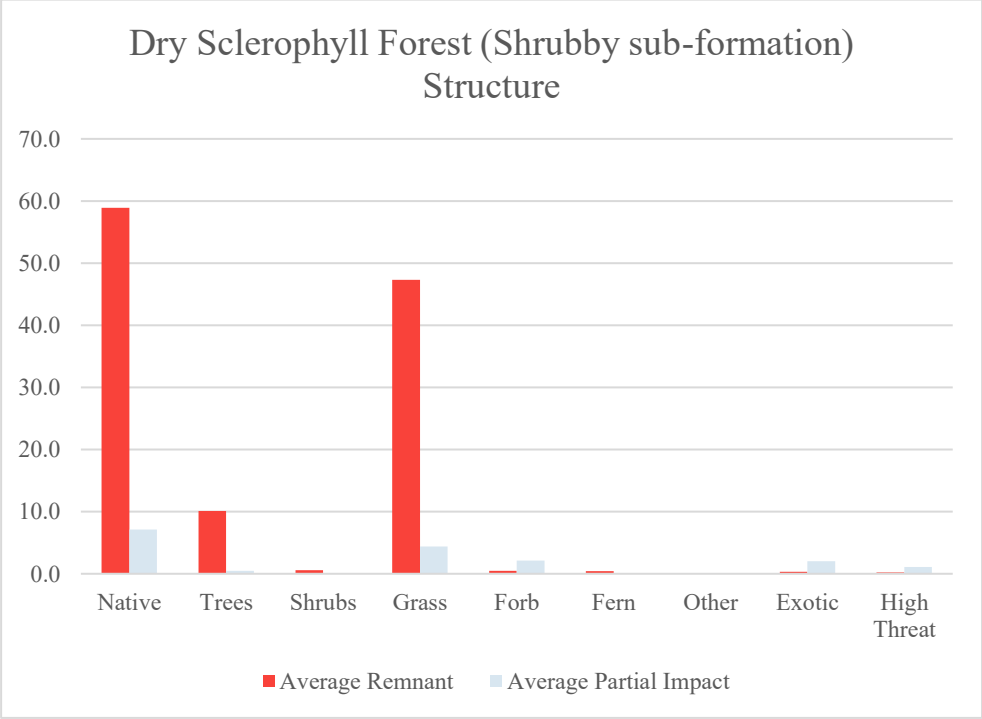


Figure 4.14 Dry Sclerophyll Forest (Shrubby sub-formation) average structure data within the ETL and adjoining remnant vegetation

4.5.1 Key trends and findings for Dry Sclerophyll Forest (Shrubby Sub-formation) attribute scores

Following analysis of the data the following general trends were observed for Dry Sclerophyll Forest (Shrubby Sub-formation) sample sites between the management of ETL and adjoining remnant vegetation areas:

- the greatest change was associated with a significant decrease in native and grass structure, alongside an increase in the composition of exotic species,
- native, grass and forb composition all increased, depicting an inverse relationship between a decrease in canopy composition and increase in grass and forb composition, and
- exotic, shrub and forb structure remained low for both ETL and adjoining remnant vegetation areas.

4.5.2 Changes in vegetation integrity for Dry Sclerophyll Forests (Shrubby Sub-formation)

The summary vegetation integrity data of each of the PCTs within Dry Sclerophyll Forst (Shrubby Sub-formation) following BAM-C calculation is provided below in Table 4.10.

A comparative analysis of observed differences in vegetation integrity values within the ETL partial impact, adjoining remnant vegetation and the approved BDAR is provided in Table 4.10 and Figure 4.15.

Table 4.10 VI data of the sampled PCTs within the Dry Sclerophyll Forests (Shrubby sub-formation) within the ETL, adjoining remnant vegetation and corresponding predicted VI in the approved BDAR.

Vegetation Formation	Condition	Composition Condition Score	Structure Condition Score	Function Condition Score	VI Score	Change in %
Dry Sclerophyll Forest (Shrubby Sub-formation	Average Remnant	49.1	20.9	17.9	26.4	n/a
	Average partial impact	48.2	6.4	14.0	16.3	n/a
	Post Construction VI Loss				**-10.1**	**38.2**
	BDAR Average partial impact VI				30.8	n/a
	BDAR Average Predicted VI loss				**-34.1**	**47.5**

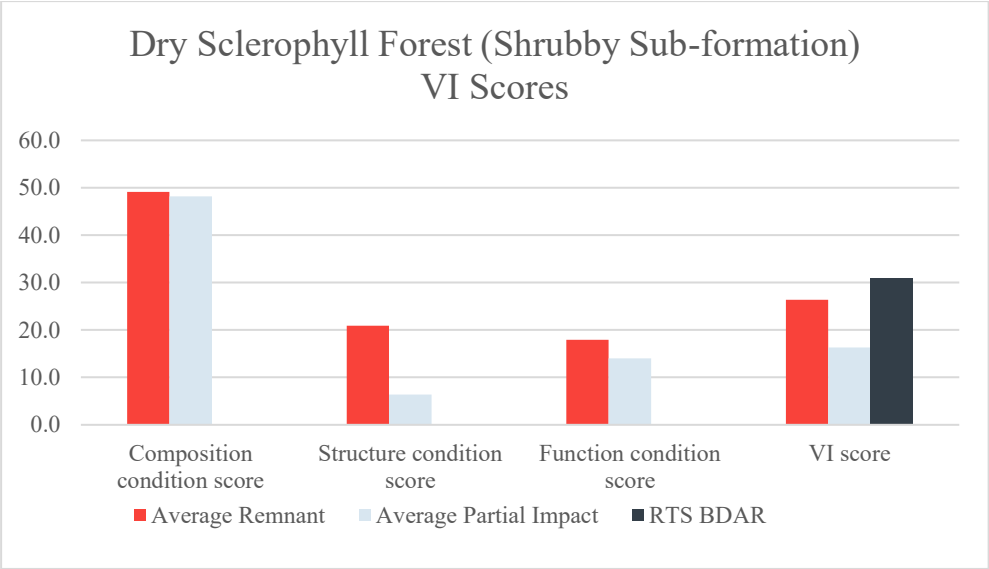


Figure 4.15 Dry Sclerophyll Forests (Shrubby sub-formation) average change in vegetation integrity values within the ETL partial clearing zone, adjoining remnant vegetation and approved BDAR.

4.5.3 Key trends and findings for Forested Wetlands integrity (VI)

Following analysis of the data the following general trends were observed for the Forested Wetlands sample sites between the management of ETL and adjoining remnant vegetation areas:

- the composition component of VI remains consistent with remnant vegetation,
- the greatest change to VI is attributed to the decreases in structure condition score, which decreased by 69.4%, and
- field sampled post-construction plots showed a smaller reduction in VI (38.2%) than the predicted VI reduction in the approved BDAR (47.5%).

4.6 Historically managed easements

In addition to the post-construction ETL easement, additional paired BAM plots for a range of PCTs within the Semi-arid Woodlands (Grassy sub-formation), Semi-arid Woodlands (Shrubby sub-formation) and Forested Wetlands in historically managed easements (>20 years management) (Table 3.2).

4.6.1 Semi-arid Woodlands (Grassy sub-formation)

Summary data for paired BAM VI plots for dominant PCTs (15 and 26) within the Semi-arid Woodlands (Grassy sub-formation) is provided below in Table 4.11.

A comparative analysis of observed differences in sampled cover and composition attributes between the sampled remnant and adjoining ETLs managed for a partial impact is provided in Figure 4.16 and Figure 4.17.

Photographs of indicative sample sites are provided in Photo 4.27 - Photo 4.30.



Photo 4.27 PCT 15 – Remnant vegetation in moderate-good condition (BlackBox_02Remnant)



Photo 4.28 PCT 15 – Historic ETL (BlackBox_02PL)



Photo 4.29 PCT 26 – Remnant vegetation in moderate-good condition (Myall_01Remnant)



Photo 4.30 PCT 26 – Historic ETL (Myall01_PL)

Table 4.11 Summary data of the sampled PCTs within the historically managed Semi-arid Woodlands (Grassy sub-formation) within the historically managed easement and remnant vegetation

Semi-arid Woodlands (Grassy sub-formation)	Structure data - Percentage Cover									Composition data - Species Richness								
	Native	Trees	Shrubs	Grass	Forbs	Fern	Other	Exotic	High threat weed	Native	Trees	Shrubs	Grass	Forbs	Fern	Other	Exotic	High threat weed
PCT 15 – Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)																		
Average Remnant	11.3	1.0	7.3	0.7	2.3	0.0	0.0	1.7	1.3	29.5	6.7	17.5	0.1	5.2	0.0	0.0	1.3	1.2
Average Historic	11.0	0.0	7.0	0.0	3.0	1.0	0.0	2.0	0.0	16.7	0.0	15.6	0.0	1.0	0.1	0.0	0.2	0.0
PCT 26 – Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion																		
Average Remnant	18.7	1.0	7.3	4.3	5.7	0.0	0.3	1.0	0.7	33.6	5.7	16.0	4.1	7.6	0.0	0.3	0.1	0.1
Average Historic	21.0	1.0	8.0	6.0	6.0	0.0	0.0	0.0	0.0	46.6	1.0	16.4	28.4	0.8	0.0	0.0	0.0	0.0

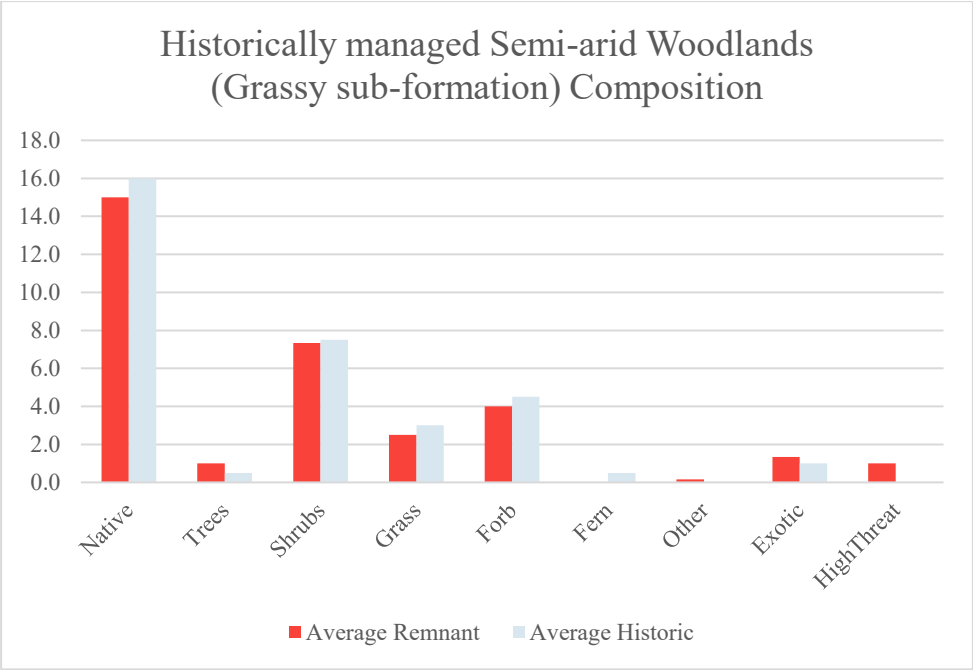


Figure 4.16 Historically managed Semi-arid Woodlands (Grassy sub-formation) comparative change in vegetation integrity attributes values for partial impact (under transmission line) and remnant (adjacent to transmission line).

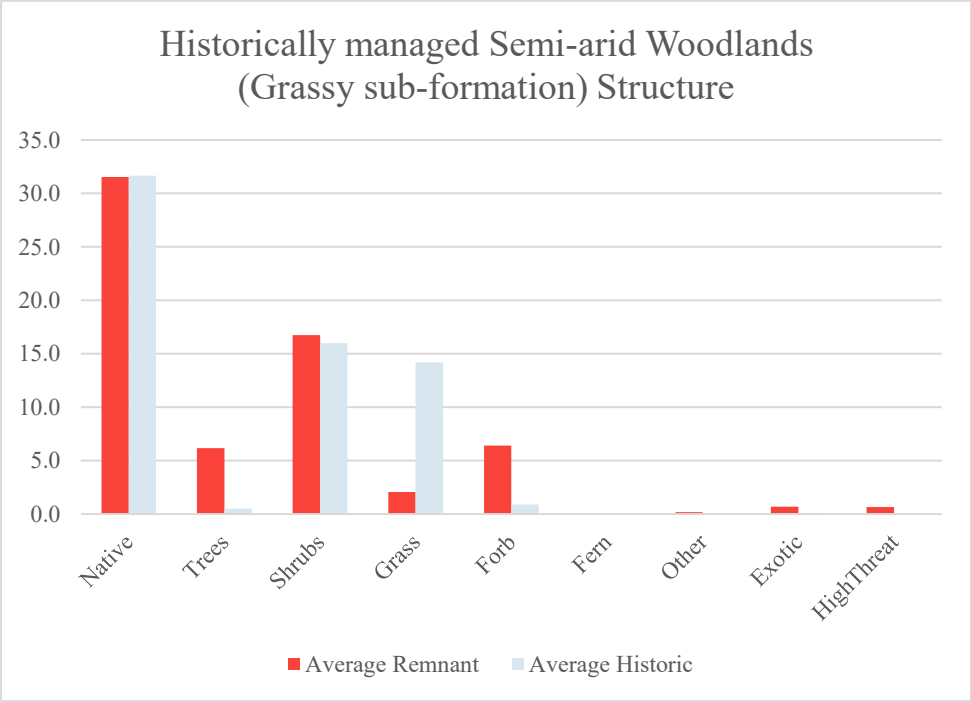


Figure 4.17 Historically managed Semi-arid Woodlands (Grassy sub-formation) comparative change in vegetation integrity attributes values for partial impact (under transmission line) and remnant (adjacent to transmission line).

Key trends and findings for historically managed Semi-arid Woodlands (Grassy sub-formation) attribute scores

The following general trends were observed for the historically managed Semi-arid Woodlands (Grassy sub-formation) sample sites within existing ETL:

- the greatest observed change was associated with loss in canopy and increase in grass cover within the easement,
- there was an inverse relationship between the decreased canopy cover resulting in a substantial increase in grass cover within the easement,
- native composition and structure remained relatively consistent, and
- the exotic and high threat composition and structure remained relatively consistent.

Changes in vegetation integrity for historically managed Semi-arid Woodlands (Grassy sub-formation)

The summary vegetation integrity within the historically managed Semi-arid Woodlands (Grassy sub-formation) following BAM-C calculation is provided below in Table 4.12.

A comparative analysis of observed differences in vegetation integrity values within the historic ETL and adjoining remnant vegetation is provided in Table 4.12 and Figure 4.18.

Table 4.12 Summary vegetation integrity data of the sampled PCTs within the historically managed Semi-arid Woodlands (Grassy sub-formation) within the ETL and adjoining remnant vegetation.

Vegetation Formation	Condition	Composition Condition Score	Structure Condition Score	Function Condition Score	VI Score	Change in %
Semi-arid Woodlands (Grassy sub-formation	Average Remnant	66.7	78.4	71.3	71.3	n/a
	Average Historic	73.4	59.5	21.2	45.2	n/a
	VI Loss				**-26.2**	**36.7**
	BDAR Average partial impact VI				45.6	n/a
	BDAR Average Predicted VI loss				**-32.2**	**58.6**

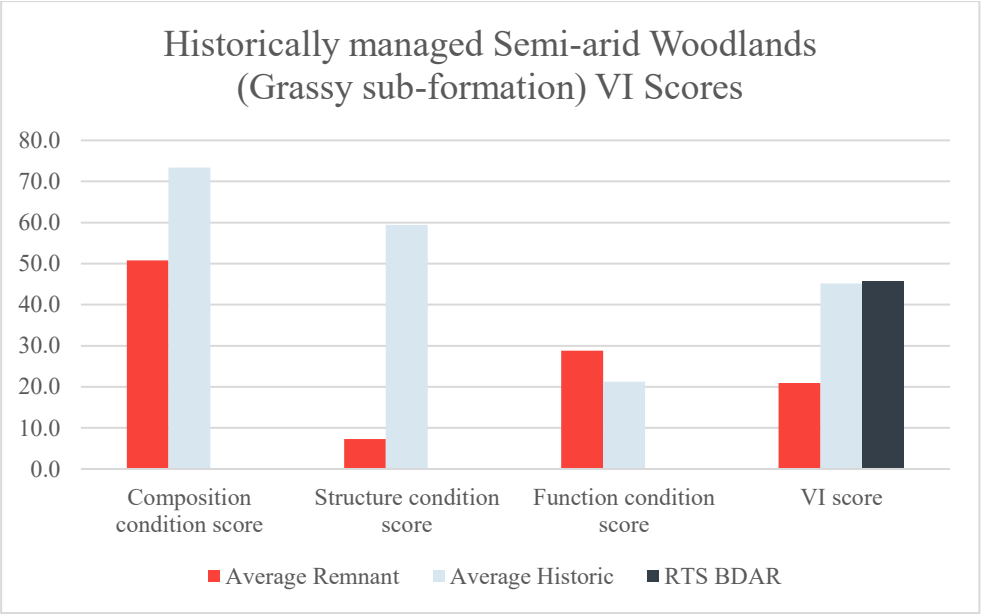


Figure 4.18 Average historically managed Semi-arid Woodlands (Grassy sub-formation) change in vegetation integrity values within ETL, adjoining remnant vegetation and approved BDAR.

Key trends and findings for historically managed Semi-arid Woodlands (Grassy sub-formation) vegetation integrity (VI)

The following general trends were observed for the historically managed Semi-arid Woodlands (Grassy sub-formation) vegetation integrity changes:

- the greatest change to VI is attributed to the increase in the composition and structure scores within the historic ETL,
- there is an inverse relationship between the loss of canopy cover and an increase in composition and structure scores within the historic ETLs, and
- the total average VI within the historically managed ETLs and the approved BDAR are consistent (45.2 and 45.6 respectively).

4.6.2 Semi-arid Woodlands (Shrubby sub-formation)

Summary data for paired BAM VI plots for sampled PCTs (28, 58, 170 and 172) within the Semi-arid Woodlands (Shrubby sub-formation) is provided below in Table 4.13.

A comparative analysis of observed differences in sampled cover and composition attributes between the sampled remnant and adjoining ETLs managed for a partial impact is provided in Figure 4.19 and Figure 4.20.

Photographs of indicative sample sites are provided in Photo 4.31 - Photo 4.38.



Photo 4.31 PCT 28 – Remnant vegetation in moderate-good condition (Pine_02Remnant)



Photo 4.32 PCT 28 – Historic ETL (Pine_02PL)



Photo 4.33 PCT 58 – Remnant vegetation in moderate-good condition (BlackOak_01Remnant)



Photo 4.34 PCT 58 – Historic ETL (BlackOak_01PL)



Photo 4.35 PCT 170 – Remnant vegetation in moderate-good condition (Mallee_02Remnant)



Photo 4.36 PCT 170 – Historic ETL (Mallee_02PL)



Photo 4.37 PCT 172 – Remnant vegetation in moderate-good condition (Mallee_01Remnant)



Photo 4.38 PCT 172 – Historic ETL (Mallee_01PL)

Table 4.13 Summary data of the sampled PCTs within the historically managed Semi-arid Woodlands (Shrubby sub-formation) within the historically managed easement and remnant vegetation

Semi-arid Woodlands (Grassy sub-formation)	Structure data - Percentage Cover									Composition data - Species Richness								
	Native	Trees	Shrubs	Grass	Forbs	Fern	Other	Exotic	High threat weed	Native	Trees	Shrubs	Grass	Forbs	Fern	Other	Exotic	High threat weed
PCT 28 - White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone																		
Average Remnant	6.5	1.0	2.0	2.5	1.0	0.0	0.0	7.0	2.0	14.7	2.0	0.9	11.8	0.1	0.0	0.0	3.8	1.7
Average Historic	7.0	0.0	2.0	4.0	1.0	0.0	0.0	0.0	0.0	38.2	0.0	1.1	37.0	0.1	0.0	0.0	0.0	0.0
PCT 58 - Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion																		
Average Remnant	17.3	1.3	11.3	1.7	2.3	0.0	0.7	0.7	0.7	20.6	4.0	15.5	0.2	0.3	0.0	0.5	0.1	0.1
Average Historic	15.0	0.0	9.5	1.5	4.0	0.0	0.0	2.5	1.0	13.4	0.0	12.3	0.6	0.5	0.0	0.0	0.4	0.2
PCT 170 - Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones																		
Average Remnant	23.0	3.0	16.0	2.0	2.0	0.0	0.0	0.0	0.0	21.3	7.0	11.1	1.1	2.1	0.0	0.0	0.0	0.0
Average Historic	24.0	0.0	16.0	4.0	4.0	0.0	0.0	5.0	1.0	25.0	0.0	24.1	0.4	0.5	0.0	0.0	2.5	0.1
PCT 172 - Deep sand mallee of irregular dunefields of the semi-arid (warm) zone																		
Average Remnant	15.0	5.0	6.0	3.0	1.0	0.0	0.0	0.0	0.0	23.6	20.0	3.1	0.4	0.1	0.0	0.0	0.0	0.0
Average Historic	17.0	2.0	5.0	6.0	4.0	0.0	0.0	0.0	0.0	40.1	1.2	2.7	35.8	0.4	0.0	0.0	0.0	0.0

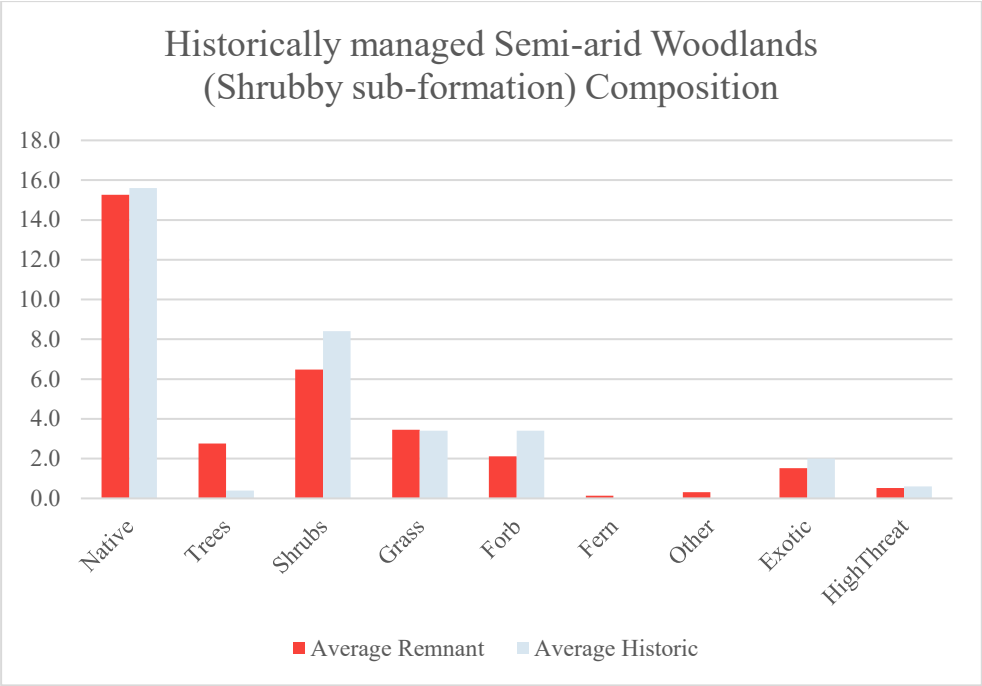


Figure 4.19 Historically managed Semi-arid Woodlands (Shrubby sub-formation) comparative change in vegetation integrity attributes values for partial impact (under transmission line) and remnant (adjacent to transmission line).

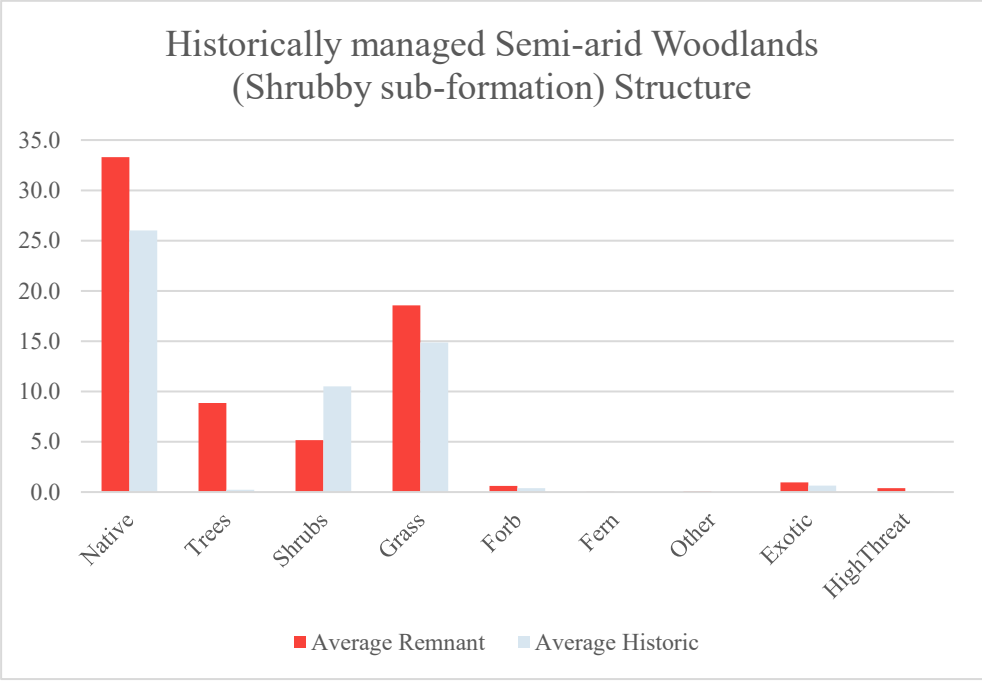


Figure 4.20 Historically managed Semi-arid Woodlands (Shrubby sub-formation) comparative change in vegetation integrity attributes values for partial impact (under transmission line) and remnant (adjacent to transmission line).

Key trends and findings for historically managed Semi-arid Woodlands (Shrubby sub-formation) attribute scores

The following general trends were observed for the historically managed Semi-arid Woodlands (Shrubby sub-formation) sample sites within existing ETL:

- the greatest observed change was associated with loss in native and grass cover, alongside loss of canopy composition within the easement,
- there was an inverse relationship between the decreased canopy cover resulting in a substantial increase in shrub composition and cover within the easement, and
- the exotic and high threat exotic composition and structure remained consistent.

Changes in vegetation integrity for historically managed Semi-arid Woodlands (Shrubby sub-formation)

The summary vegetation integrity within the historically managed Semi-arid Woodlands (Shrubby sub-formation) following BAM-C calculation is provided below in Table 4.14.

A comparative analysis of observed differences in vegetation integrity values within the historic ETL and adjoining remnant vegetation is provided in Table 4.14 and Figure 4.21.

Table 4.14 Summary vegetation integrity data of the sampled PCTs within the historically managed Semi-arid Woodlands (Shrubby sub-formation) within the ETL and adjoining remnant vegetation.

Vegetation Formation	Condition	Composition Condition Score	Structure Condition Score	Function Condition Score	VI Score	Change in %
Semi-arid Woodlands (Shrubby sub-formation	Average Remnant	70.4	60.7	44.1	55.1	n/a
	Average Historic	62.7	62.2	11.0	31.1	n/a
	VI Loss				**-24.0**	**43.5**
	BDAR Average partial impact VI				40.9	n/a
	BDAR Average Predicted VI loss				**-35.3**	**46.3**

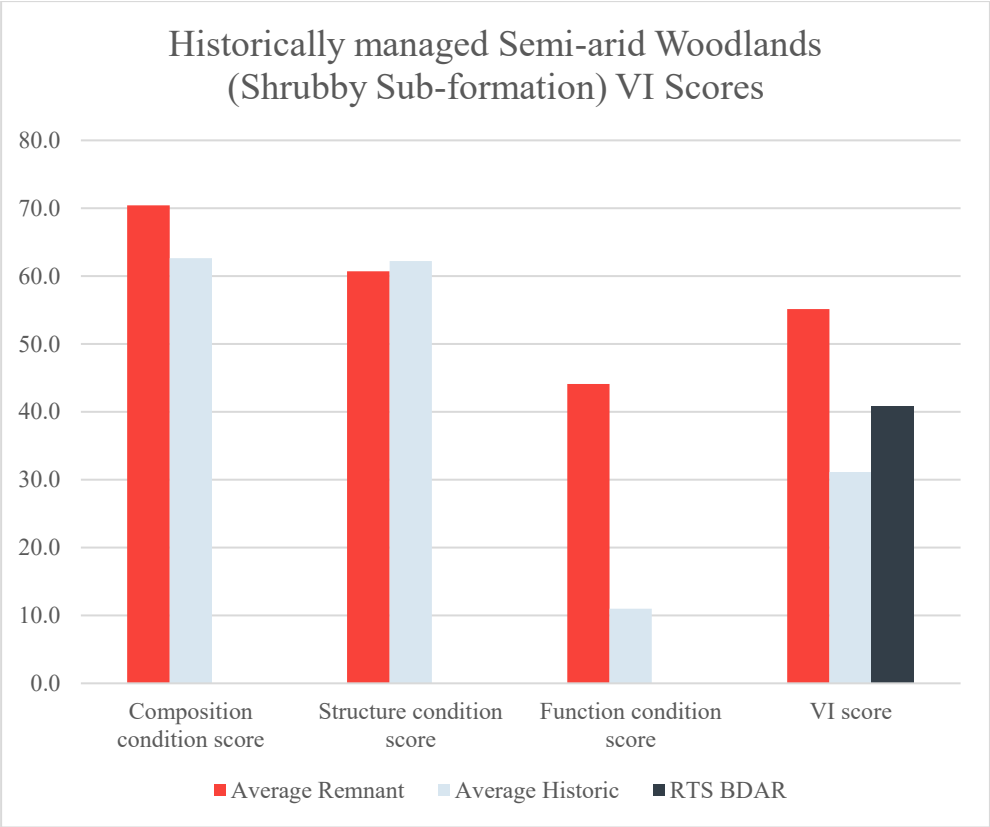


Figure 4.21 Average historically managed Semi-arid Woodlands (Shrubby sub-formation) change in vegetation integrity values within ETL, adjoining remnant vegetation and approved BDAR.

Key trends and findings for historically managed Semi-arid Woodlands (Shrubby sub-formation) vegetation integrity (VI)

The following general trends were observed for the historically managed Semi-arid Woodlands (Shrubby sub-formation) vegetation integrity changes:

- the change in composition and structure component of VI is relatively minimal, being 11% decrease and 2.5% increase respectively,
- the greatest change to VI is attributed to the decreases in function score (~75%), and
- the total average VI loss was 24.0 or a 43.5% decrease, which is greater than the VI reduction observed in the post-construction paired plots.

4.6.3 Forested Wetlands

Summary data for paired BAM VI plots for sampled PCTs within the Forested Wetlands formation is provided below in Table 4.15.

A comparative analysis of observed differences in sampled cover and composition attributes between the sampled remnant and adjoining ETLs managed for a partial impact is provided in Figure 4.22 and Figure 4.23.

Photographs of indicative sample sites are provided in Photo 4.39 - Photo 4.42.



Photo 4.39 PCT 8 – Remnant vegetation in moderate-good condition (RedGum_01Remnant)



Photo 4.40 PCT 8 - Historic ETL (RedGum_01PL)



Photo 4.41 PCT 11 – Remnant vegetation in moderate-good condition (RedGum_03Remnant)



Photo 4.42 PCT 11 – Historic ETL (RedGum_03PL)

Table 4.15 Summary data of the sampled PCTs within the historically managed Forested Wetlands within the historically managed easement and remnant vegetation

Forested Wetlands	Structure data - Percentage Cover									Composition data - Species Richness								
	Native	Trees	Shrubs	Grass	Forbs	Fern	Other	Exotic	High threat weed	Native	Trees	Shrubs	Grass	Forbs	Fern	Other	Exotic	High threat weed
PCT 8 – River Red Gum – Warrego Grass – Couch Grass riparian tall woodland wetland of the semi-arid (warm) climate zone (Riverina Bioregion and Murray Darling Depression Bioregion)																		
Average Remnant	8.0	1.0	1.0	5.0	0.0	1.0	0.0	2.0	1.0	11.6	10.0	0.1	1.4	0.0	0.1	0.0	0.2	0.1
Average Historic	12.5	1.5	2.0	2.5	6.0	0.5	0.0	1.5	1.0	17.9	1.3	0.5	0.3	15.9	0.1	0.0	0.3	0.2
PCT 11 – River Red Gum – Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)																		
Average Remnant	10.0	1.0	2.0	4.0	3.0	0.0	0.0	0.0	0.0	15.9	15.0	0.2	0.4	0.3	0.0	0.0	0.0	0.0
Average Historic	8.0	0.0	2.0	3.0	3.0	0.0	0.0	1.0	1.0	4.0	0.0	3.2	0.5	0.3	0.0	0.0	0.2	0.2

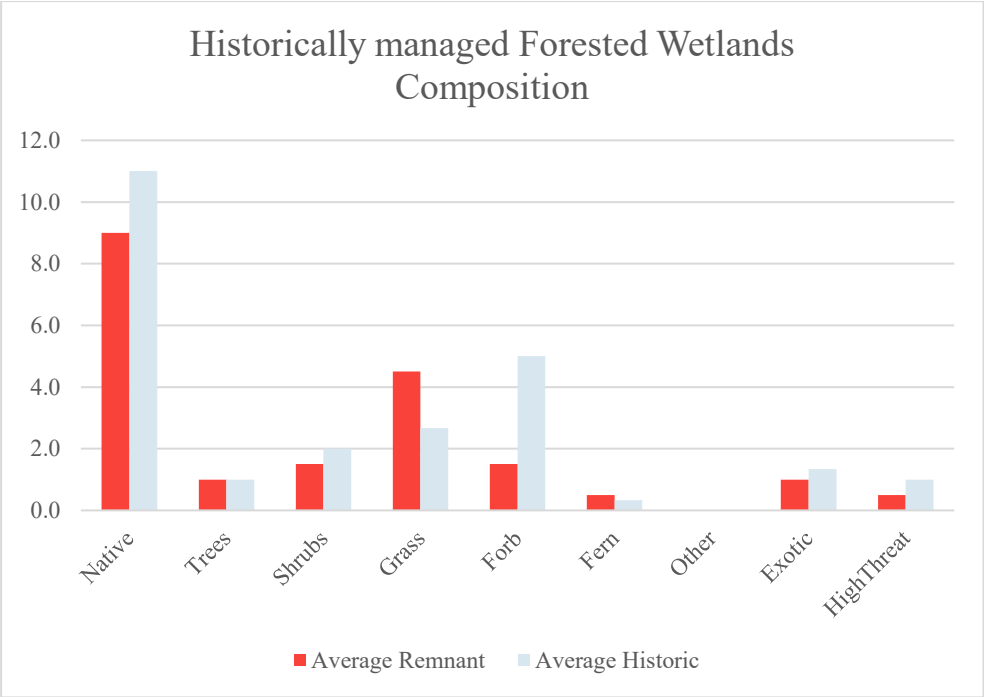


Figure 4.22 Historically managed Forested Wetlands comparative change in vegetation integrity attributes values for partial impact (under transmission line) and remnant (adjacent to transmission line)

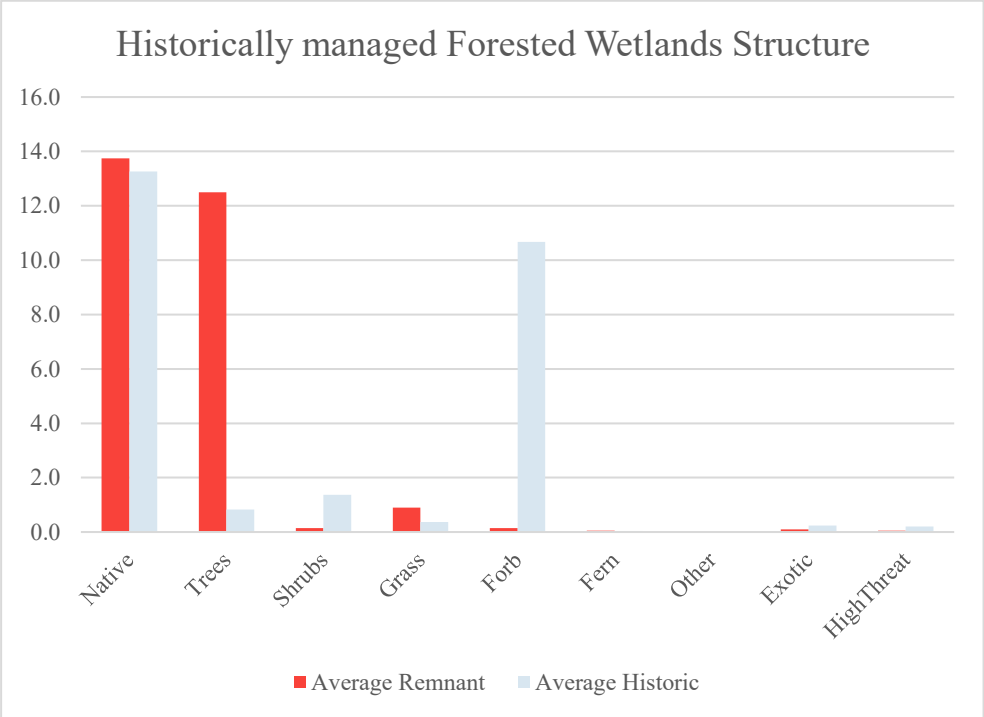


Figure 4.23 Historically managed Forested Wetlands comparative change in vegetation integrity attributes values for partial impact (under transmission line) and remnant (adjacent to transmission line)

Key trends and findings for historically managed Forested Wetlands attribute scores

The following general trends were observed for the historically managed Forested Wetlands sample sites within existing ETL:

- there is an inverse relationship between the decrease in canopy cover and an increase in forb composition and structure,
- native species composition was recorded to be slightly increased in the historically managed ETL, and
- exotic and high threat weed composition and structure remain relatively constant but are subject to a slight increase within the historically managed ETL.

Changes in vegetation integrity for historically managed Forested Wetlands

The summary vegetation integrity within the historically managed Forested Wetlands following BAM-C calculation is provided below in Table 4.16.

A comparative analysis of observed differences in vegetation integrity values within the historic ETL and adjoining remnant vegetation is provided in Table 4.16 and Figure 4.24.

Table 4.16 Summary vegetation integrity data of the sampled PCTs within the historically managed Forested Wetlands within the ETL and adjoining remnant vegetation.

Vegetation Formation	Condition	Composition Condition Score	Structure Condition Score	Function Condition Score	VI Score	Change in %
Forested Wetlands	Average Remnant	43.7	24.8	41.0	35.1	n/a
	Average Historic	50.8	7.3	28.8	21.0	n/a
	VI Loss				**-14.1**	**40.2**
	BDAR Average partial impact VI				25.3	n/a
	BDAR Average Predicted VI loss				**-46.7**	**64.9**

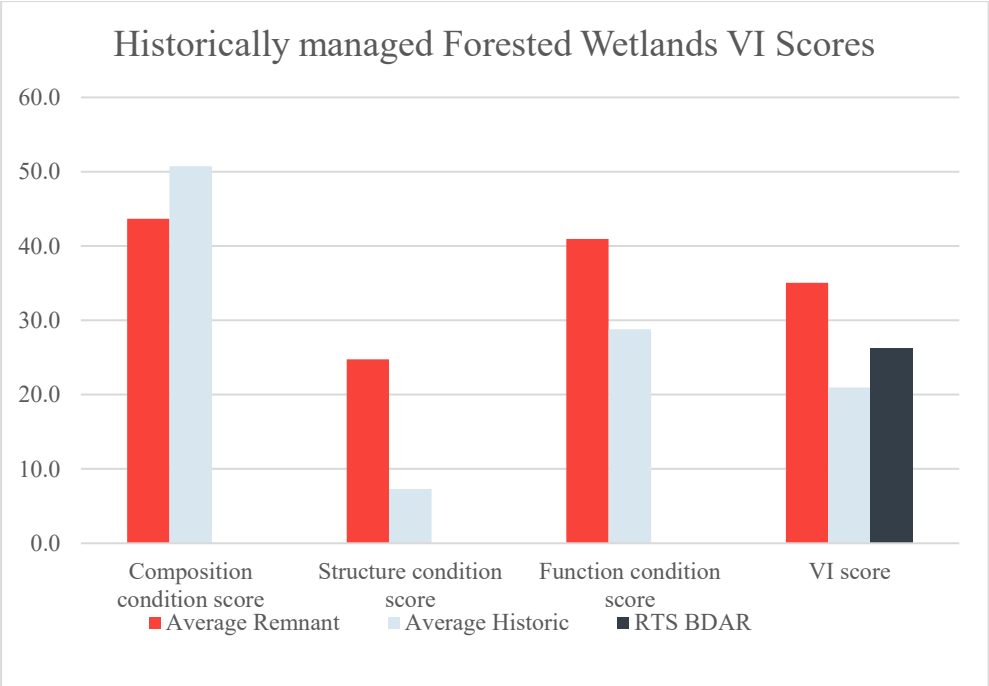


Figure 4.24 Average historically managed Forested Wetlands change in vegetation integrity values within ETL, adjoining remnant vegetation and approved BDAR.

Key trends and findings for historically managed Forested Wetlands vegetation integrity (VI)

The following general trends were observed for the historically managed Forested Wetlands vegetation integrity changes:

- there was an increase in average composition score,
- the greatest change to VI is attributed to the decrease in structure score (~70.5%), and
- the percentage loss in VI is less than the approved BDAR, being 40.2% and 64.9% respectively.

5. Comparison with other historically managed ETLs

The growing evidence base from a wide range of historically managed existing ETLs further confirms the retained biodiversity values within ETLs and appropriate application of partial impact under the BAM. Data collected by WSP for the Central West Orana Transmission Connections and Hunter Transmission Project (HTP) has consistently recorded vegetation integrity values between 32 and 53.3 within ETL partial impact areas, above the VI estimated from 30% reduction approach adopted within the approved BDAR. A summary of previously sampled and historically managed ETLs assessed within the BAM-C is also provided in Table 5.1 for five vegetation formations, being:

- Grassy Woodlands
- Dry Sclerophyll (Shrub/Grassy)
- Dry Sclerophyll (Grassy)
- Wet Sclerophyll Forest (Grassy) and
- Wet Sclerophyll Forest (Shrub/Grassy).

Table 5.1 Summary vegetation integrity data of the sampled PCTs within the historically managed ETLs (WSP)

Vegetation Formation	IBRA Subregion	Method	Composition condition score	Structure condition score	Function condition score	VI Score	VI Change %
Grassy woodlands	Inland Slopes	Remnant	82.1	78.8	67.2	74.9	n/a
		Partial Impact	74.5	58.8	25.2	47.2	37.0
		30% reduction	63.7	50.8	18.3	37.7	49.6
Dry Sclerophyll Forests (Shrubby sub-formation)	Hunter	Remnant	80.9	48.3	68.7	60.8	n/a
		Partial Impact	71.1	27.3	17.4	32.2	47.1
		30% reduction	64.8	22.2	18.7	29.2	52.0
Wet Sclerophyll Forest (Grass Sub-formation)	Wyong	Remnant	69.6	54.0	64.9	62.3	n/a
		Partial Impact	78.9	45.8	39.0	51.3	17.6
		30% reduction	48.7	37.8	45.4	43.6	30.0
Wet Sclerophyll Forest (Shrubby Sub-formation)	Wyong	Remnant	86.8	65.3	66.9	72.4	n/a
		Average Partial Impact	75.2	39.1	52.2	53.5	18.9
		30% reduction	60.8	45.7	46.8	50.7	21.7
Dry Sclerophyll Forests (Shrub/grass sub-formation)	Hunter	Remnant	81.8	55.7	55.5	63.2	n/a
		Average Partial Impact	61.4	50.7	17.9	38.2	25.0
		30% reduction	57.3	39.0	38.9	44.2	19.0

6. Comparing predicted partial impact offset liability with post-construction data

6.1 Review of predicted reduction in attribute values

The approved BDAR adopted a conservative literature-based assumption for the reduction in attribute values and changes in VI. Following the detailed post-construction field investigations the adopted changes for the approved BDAR were found to generally overestimate the partial impacts for a range of attribute values. A summary of the observed per cent reduction is provided below in Table 6.1, Figure 6.1 and Figure 6.2.

The key findings identified include:

- At least one of the shrub, forb and grass attributes composition and structure generally increased for all formations.
- Decreases in grass and forb composition were less than estimated in the approved BDAR.
- Generally, there is an inverse relationship established between canopy cover reduction and increased forb composition and structure.
- A tree component is retained in both structure and composition scores.
- Given the extremely low values and scores for the Fern, Other, Exotic and Hight threat Exotic attributes, an assessment % change is uninformative.

Table 6.1 Observed average percentage adjustment to BAM-C attribute scores for partial impacts within the ETL by formation

Formation	Composition (% reduction)									Structure (% reduction)								
	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	High Threat	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	High Threat
Semi-arid Woodlands (Grassy sub-formation)	-10.0	0.0	-15.9	20.0	-16.7	NI	NI	NI	NI	3.1	40.3	6.9	-75.8	-8.9	NI	NI	NI	NI
Semi-arid Woodlands (Shrubby sub-formation)	-1.1	19.0	5.5	-6.9	-42.7	NI	NI	NI	NI	19.6	48.2	36.7	2.3	-22.5	NI	NI	NI	NI
Grassy Woodlands	-1.6	0.0	-53.3	10.3	4.4	NI	NI	NI	NI	3.8	13.1	-80.0	-1.1	-48.1	NI	NI	NI	NI
Forested Wetlands	-5.6	0.0	-66.7	22.2	-66.7	NI	NI	NI	NI	89.1	95.6	-66.7	50.0	-66.7	NI	NI	NI	NI
Dry Sclerophyll Forest (Shrubby Sub-formation)	-12.5	50.0	50.0	-28.6	-75.0	NI	NI	NI	NI	87.9	95.0	83.3	90.7	-320.0	NI	NI	NI	NI
BDAR	NA	100.0	30.0	30.0	30.0	30.0	30.0	NA	NA	NA	100.0	0.0	0.0	0.0	0.0	0.0	NA	NA

Notes: NA= Not appliable, NI = change in attribute data is insufficient and Not Informative

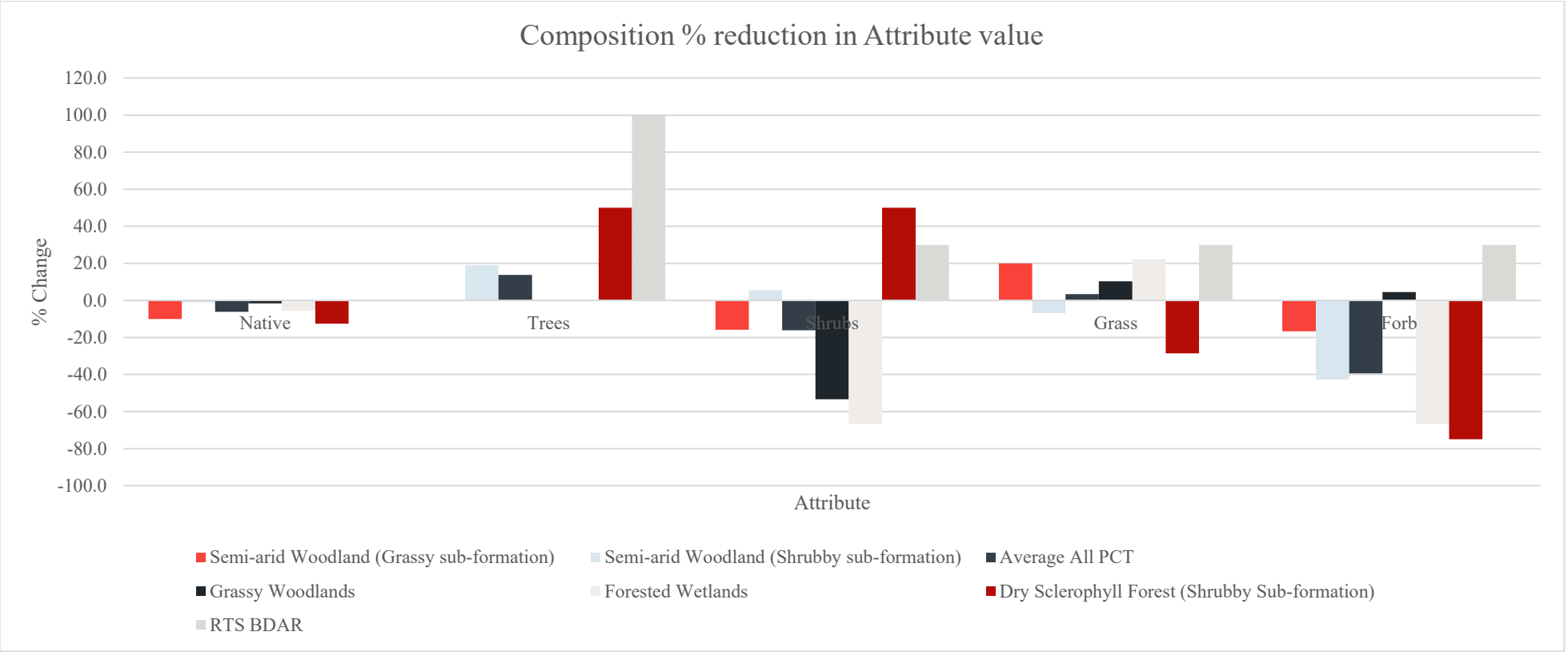


Figure 6.1 Observed percentage change in attribute composition in post construction partial impact area and predicted approved BDAR. Attributes that are Not Informative (NI) have been excluded.

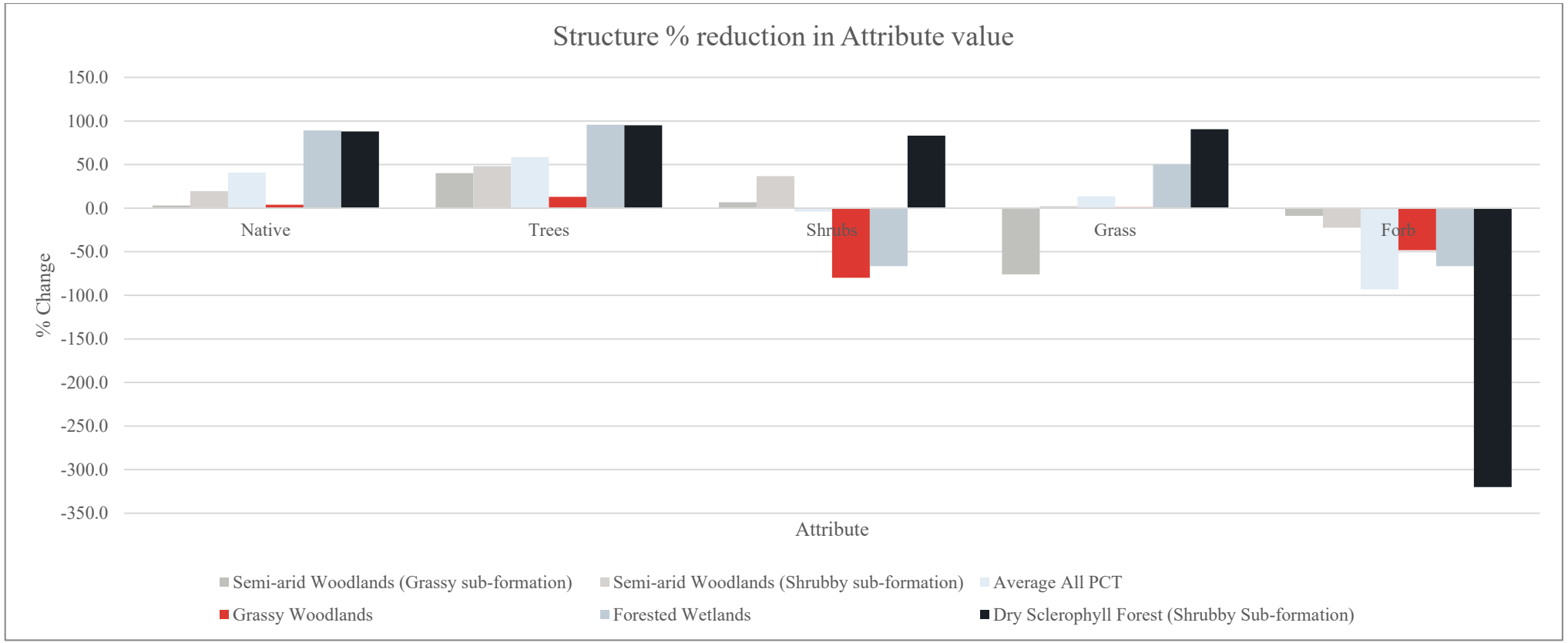


Figure 6.2 Observed percentage change in attribute structure in post construction partial impact area and predicted approved BDAR. Attributes that are Not Informative (NI) have been excluded.

6.2 Recommended adoption of changes in attributes following post-construction surveys

Based on the results of post-construction surveys it is recommended the literature-based assumptions and changes in VI for Semi-arid Woodlands (Grassy sub-formation), Semi-arid Woodlands (Shrubby sub-formation), Grassy Woodlands, Forested Wetlands and Dry Sclerophyll Forests (Shrubby sub-formation) are revised to reflect the field verified evidence base.

A summary of the adopted literature-based reduction in attribute values in the approved BDAR compared to the recommended changes informed by the post-construction surveys of Disturbance area B are presented below in Table 6.2.

Table 6.2 Proposed percentage reduction to BAM-C vegetation attribute scores for partial impacts within the ETL by formation.

Formation	Composition (% reduction)				Structure (% reduction)				Function (% reduction)	
	Canopy	Shrub	Grass	Forb	Canopy	Shrub	Grass	Forb	Canopy	Fallen Timber and Leaf litter
Semi-arid Woodlands (Grassy sub-formation)										
Final Approved BDAR	100	30	30	30	100	0	0	0	Complete loss	25
Post-construction	0	0	20	0	45	10	0	0	Complete loss	5
Semi-arid Woodlands (Shrubby sub-formation)										
Final Approved BDAR	100	30	30	30	100	0	0	0	Complete loss	25
Post-construction	20	10	0	0	50	40	5	0	Complete loss	10
Grassy Woodlands										
Final Approved BDAR	100	30	30	30	100	0	0	0	Complete loss	25
Post-construction	0	0	15	5	15	0	5	0	Complete loss	0
Forested Woodlands										
Final Approved BDAR	100	30	30	30	100	0	0	0	Complete loss	25

Formation	Composition (% reduction)				Structure (% reduction)				Function (% reduction)	
	Canopy	Shrub	Grass	Forb	Canopy	Shrub	Grass	Forb	Canopy	Fallen Timber and Leaf litter
Post-construction	0	0	25	0	100	0	50	0	Complete loss	0
Dry Sclerophyll Forest (Shrubby Sub-formation)										
Final Approved BDAR	100	30	30	30	100	0	0	0	Complete loss	25
Post-construction	50	50	0	0	100	85	95	0	Complete loss	0

7. Conclusion

Transgrid have undertaken an evidence-based approach to assessing post-construction partial impacts associated with the project.

This approach builds on and compares the results of field-based sampling with previously approved literature-based assumptions used for assessment of partial impacts within the approved BDAR.

The key requirement for the assessment of the post-construction partial impacts was to evaluate the construction impacts of the project with those predicated impacts within the approved BDAR.

Specifically, this assessment addressed (through collection of paired BAM plots) changes in VI and individual attribute scores across the dominant formations identified with a partial impact.

The post-construction VI scores for the assessed vegetation formations included:

- Semi-arid Woodlands (Grassy sub-formation): 63.3
- Semi-arid Woodlands (Shrubby sub-formation): 42.6
- Grassy Woodlands: 41.9
- Forested Wetlands: 11.2
- Dry Sclerophyll Forest (Shrubby Sub-formation): 16.3

With further consideration of the control sites for variables in seasonality and survey bias, the post-construction surveys observed the following per cent change to VI:

- Semi-arid Woodlands (Grassy sub-formation): 11.3%
- Semi-arid Woodlands (Shrubby sub-formation): 22.8%
- Grassy Woodlands: 35.8%
- Forested Wetlands: 68.2%
- Dry Sclerophyll Forest (Shrubby Sub-formation): 38.3%

This assessment has confirmed the approved BDAR estimate of partial impacts was reasonably conservative for several vegetation formations, and that it was likely to have overestimated the extent to

partial impact as it relates to VI loss and the BAM-C. The key trends observed throughout the post construction areas of Disturbance Areas B, were;

- while significantly reduced, some canopy composition and structure values are retained within the easement,
- exotic composition and structure increased following construction but not to the detriment of native understorey values, and
- the observed trends are generally supported by the broader scientific literature in areas of disturbance following removal or reduction in canopy and shrub layers.

Yours sincerely



Alex Cockerill
National Executive - Ecology

List of attachments

Attachment A Data sheets for Partial Impact

Attachment A
Data sheets for Partial Impact

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WSP acknowledges that every project we work on takes place on First Peoples lands.
We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

WSP Australia Pty Limited ABN 80 078 004 798

Semi-arid Woodlands (Grassy sub-formation)

BlackBox_01PECe			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
PCT 15			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 22/03/25			12	11	1	8	0	2	0	0	1	1	
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum	
			27.1	17.1	0.1	16.3	0	0.7	0	0	10	10	
Eucalyptus largiflorens	0.1	1	TG		0.1								
Maireana brevifolia	10	200	SG			10							
Sclerolaena patenticuspis	1	70	SG			1							
Einadia nutans	0.6	20	FG					0.6					
Atriplex sp. (No fertile material)	0.2	50	SG			0.2							
*Psilocaulon granulicaule**	10	1000	HT									10	
Rhagodia spinescens	2	20	SG			2							
Malacocera tricornis	0.8	20	SG			0.8							
Sclerolaena diacantha	0.2	20	SG			0.2							
Enchylaena tomentosa	2	30	SG			2							
Solanum esuriale	0.1	5	FG					0.1					
Maireana aphylla	0.1	1	SG			0.1							

Easting	739772
Northing	6146022
Orientation	250°
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	71
BAM Attributes 1x1 plot (%)	
Litter (%)	35

BlackBox_01Remnant			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
PCT 15			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 21/03/25			18	16	1	10	2	3	0	0	2	2	
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum	
			16.6	13.5	5	8	0.2	0.3	0	0	3.1	3.1	
Eucalyptus largiflorens	5	2	TG		5								
Einadia nutans	0.1	10	FG					0.1					
Atriplex semibaccata	0.1	10	SG			0.1							
Austrostipa scabra	0.1	30	GG				0.1						
Sclerolaena diacantha	0.3	30	SG			0.3							
Sclerolaena brachyptera	0.1	10	SG			0.1							
Enchylaena tomentosa	3	50	SG			3							
Salsola australis	0.1	10	SG			0.1							
*Carrichtera annua**	0.1	20	HT									0.1	
Sclerolaena patenticuspis	0.2	30	SG			0.2							
*Psilocaulon granulicaule**	3	1000	HT									3	
Maireana brevifolia	3	100	SG			3							
Rhagodia spinescens	0.8	10	SG			0.8							
Sida corrugata	0.1	5	FG					0.1					
Solanum esuriale	0.1	10	FG					0.1					
Enteropogon acicularis	0.1	10	GG				0.1						
Atriplex sp. (No fertile material)	0.1	5	SG			0.1							
Maireana georgei	0.3	20	SG			0.3							

Easting	739744
Northing	6144085
Orientation	245°
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	1
20-29	6
10-19	No
5-9	No
<5	No
Hollows	2
Length logs (m)	11
BAM Attributes 1x1 plot (%)	
Litter (%)	30

BlackBox_02PECe			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55	Easting	287014
PCT 15			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count		Northing	6139993
Date: 23/03/25			15	14	1	11	0	2	0	0	1	1		Orientation	230°
Species	Cover	Abundance	Sum cove	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum		Plot size	20 X 20 X 50
			31.2	31.1	4	17	0	10.1	0	0	0.1	0.1		BAM Attributes 20x50m plot	
Eucalyptus largiflorens	4	4	TG		4									Stem classes	
Enchylaena tomentosa	10	1000	SG			10								80+	0
Atriplex leptocarpa	0.1	20	SG			0.1								50-79	1
Salsola australis	0.2	20	SG			0.2								30-49	2
Einadia nutans subsp. *nutans*	10	1000	FG					10						20-29	2
Sclerolaena muricata var. *semiglabra*	5	100	SG			5								10-19	Yes
Rhagodia spinescens	0.8	10	SG			0.8								5-9	No
*Lycium ferocissimum**	0.1	1	HT									0.1		<5	No
Maireana aphylla	0.1	1	SG			0.1								Hollows	2
Sclerolaena muricata var. *villosa*	0.3	5	SG			0.3								Length logs (m)	27
Sclerolaena stelligera	0.1	10	SG			0.1									
Atriplex semibaccata	0.1	5	SG			0.1								BAM Attributes 1x1 plot (%)	
Maireana pentagona	0.1	20	FG					0.1						Litter (%)	54
Sclerolaena brachyptera	0.2	20	SG			0.2									
Atriplex vesicaria	0.1	5	SG			0.1									

BlackBox_02PL			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55	Easting	287036
PCT 15			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count		Northing	6139962
Date: 23/03/25			13	11	0	7	0	3	1	0	2	0		Orientation	75°
Species	Cover	Abundance	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum		Plot size	10 X 40 X 100
			16.9	16.7	0	15.6	0	1	0.1	0	0.2	0		BAM Attributes 10x100m plot	
Enchylaena tomentosa	10	500	SG			10								Stem classes	
Rhagodia spinescens	2	20	SG			2								80+	0
*Hordeum leporinum**	0.1	10	EX								0.1			50-79	0
Sclerolaena muricata var. *semiglabra*	3	50	SG			3								30-49	0
Atriplex semibaccata	0.3	30	SG			0.3								20-29	No
Sclerolaena stelligera	0.1	10	SG			0.1								10-19	No
Crassula sieberiana	0.1	10	FG					0.1						5-9	No
Einadia nutans subsp. *nutans*	0.8	30	FG					0.8						<5	No
Marsilea drummondii	0.1	10	EG						0.1					Hollows	0
Atriplex leptocarpa	0.1	10	SG			0.1								Length logs (m)	0
Atriplex lindleyi	0.1	5	FG					0.1							
*Heliotropium europaeum**	0.1	20	EX								0.1			BAM Attributes 1x1 plot (%)	
Osteocarpum acropterum	0.1	1	SG			0.1								Litter (%)	50

BlackBox_02Remnant			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
PCT 15			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 23/03/2025			9	8	1	6	0	1	0	0	1	1	
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum	
			52.7	**52.2**	10	32.2	0	10	0	0	**0.5**	0.5	
Eucalyptus largiflorens	10	5	TG		10								
Sclerolaena muricata var. semiglabra	10	1000	SG			10							
Enchylaena tomentosa	20	2000	SG			20							
Atriplex leptocarpa	0.1	20	SG			0.1							
Atriplex semibaccata	0.1	20	SG			0.1							
Einadia nutans subsp. nutans	10	2000	FG					10					
Rhagodia spinescens	1	10	SG			1							
*Lycium ferocissimum**	0.5	5	HT									0.5	
Chenopodium nitrariaceum	1	1	SG			1							

Easting	286982
Northing	6140043
Orientation	230°
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	5
30-49	2
20-29	4
10-19	No
5-9	No
<5	No
Hollows	5
Length logs (m)	43
BAM Attributes 1x1 plot (%)	
Litter (%)	41

BlackBox_03Remnant			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
PCT 15			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 23/03/25			12	10	1	6	0	3	0	0	2	1	
Species	**Cover**	**Abundance**	**Sum cove**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum	
			23	**22.8**	5	12.4	0	5.4	0	0	**0.2**	0.1	
Eucalyptus largiflorens	5	3	TG		5								
Enchylaena tomentosa	5	500	SG			5							
Einadia nutans	5	1000	FG					5					
Atriplex semibaccata	1	200	SG			1							
Atriplex lindleyi	0.3	30	FG					0.3					
Atriplex pseudocampanulata	0.3	30	SG			0.3							
Salsola australis	0.1	5	SG			0.1							
Rhagodia spinescens	5	30	SG			5							
*Lycium ferocissimum**	0.1	1	HT									0.1	
Sclerolaena muricata var. semiglabra	1	20	SG			1							
*Hordeum leporinum**	0.1	10	EX								0.1		
Solanum coactiliferum	0.1	1	FG					0.1					

Easting	318335
Northing	6145346
Orientation	195°
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	2
30-49	3
20-29	0
10-19	No
5-9	No
<5	No
Hollows	4
Length logs (m)	56
BAM Attributes 1x1 plot (%)	
Litter (%)	38

BlackBox_03PECe			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55	Easting	318300
PCT 15			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count		Northing	6145416
Date: 23/03/25			10	10	1	7	0	2	0	0	0	0		Orientation	265°
Species	Cover	Abundance	Sum cove	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum		Plot size	20 X 20 X 50
			34.6	34.6	1	23.5	0	10.1	0	0	0	0		BAM Attributes 20x50m plot	
Eucalyptus largiflorens	1	1	TG		1									Stem classes	
Enchylaena tomentosa	10	1000	SG			10								80+	0
Einadia nutans	10	2000	FG					10						50-79	0
Sclerolaena muricata var. semiglabra	10	1000	SG			10								30-49	0
Salsola australis	0.2	20	SG			0.2								20-29	1
Atriplex semibaccata	0.2	50	SG			0.2								10-19	No
Sclerolaena muricata var. muricata	2	1000	SG			2								5-9	No
Rhagodia spinescens	1	20	SG			1								<5	No
Atriplex lindleyi	0.1	20	FG					0.1						Hollows	0
Atriplex pseudocampanulata	0.1	10	SG			0.1								Length logs (m)	78
														BAM Attributes 1x1 plot (%)	
														Litter (%)	24

Myall_01Remnant			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
PCT 26			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 18/03/2025			26	26	1	12	4	8	0	1	0	0	
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum	
			43.4	43.4	10	12.4	20	0.9	0	0.1	0	0	
Acacia pendula	10	20	TG		10								
Rytidosperma caespitosum	15	1000	GG				15						
Sclerolaena diacantha	1	20	SG			1							
Abutilon halophilum	1	30	SG			1							
Salsola australis	1	30	SG			1							
Sporobolus caroli	2	50	GG				2						
Sclerolaena tricuspis	0.4	20	SG			0.4							
Maireana appressa	1	30	SG			1							
Atriplex semibaccata	2	30	SG			2							
Sclerolaena bicornis var. *bicornis*	0.3	10	SG			0.3							
Austrostipa scabra	2	500	GG				2						
Vittadinia sp.	0.1	10	FG					0.1					
Rhagodia spinescens	5	10	SG			5							
Maireana brevifolia	0.2	20	SG			0.2							
Roepera glauca	0.1	5	FG					0.1					
Einadia nutans	0.1	10	FG					0.1					
Convolvulus angustissimus	0.1	10	OG							0.1			
Maireana pentagona	0.2	50	FG					0.2					
Goodenia sp.	0.1	5	FG					0.1					
Euphorbia drummondii	0.1	5	FG					0.1					
Maireana enchylaenoides	0.1	10	FG					0.1					
Sclerolaena stelligera	0.1	10	SG			0.1							
Atriplex leptocarpa	0.1	10	SG			0.1							
Sida trichopoda	0.1	10	FG					0.1					
Enchylaena tomentosa	0.3	5	SG			0.3							
Walwhalleya proluta	1	20	GG				1						

Easting	362515
Northing	6221570
Orientation	275°
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	1
20-29	Yes
10-19	Yes
5-9	Yes
<5	Yes
Hollows	0
Length logs (m)	5
BAM Attributes 1x1 plot (%)	
Litter (%)	16

Myall_01PL			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
PCT 26			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 18/03/2025			21	21	1	8	6	6	0	0	0	0	
Species	**Cover**	**Abundance**	**Sum cove**	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
			46.6	46.6	1	16.4	28.4	0.8	0	0	0	0	
Rytidosperma caespitosum	20	1000	GG				20						
Salsola australis	0.7	30	SG			0.7							
Atriplex semibaccata	5	40	SG			5							
Sporobolus caroli	3	200	GG				3						
Sclerolaena tricuspis	2	60	SG			2							
Sclerolaena bicornis var. *bicornis*	4	40	SG			4							
Sclerolaena tricuspis	1	40	SG			1							
Austrostipa scabra	2	100	GG				2						
Austrostipa sp. (no fertile material)	2	100	GG				2						
Abutilon halophilum	0.7	50	SG			0.7							
Solanum esuriale	0.1	10	FG					0.1					
Vittadinia sp.	0.2	20	FG					0.2					
Calocephalus sonderi	0.1	10	FG					0.1					
Maireana appressa	2	30	SG			2							
Chloris truncata	1	60	GG				1						
Acacia pendula	1	1	TG		1								
Sida trichopoda	0.2	20	FG					0.2					
Walwhalleya proluta	0.4	20	GG				0.4						
Rhagodia spinescens	1	2	SG			1							
Ptilotus exaltatus	0.1	10	FG					0.1					
Plantago spp.	0.1	10	FG					0.1					

Easting	362571
Northing	6221593
Orientation	350°
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	Yes
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	32

Myall_02PECe			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
PCT 26			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 24/03/25			28	28	1	9	5	12	1	0	0	0	
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum	
			36.8	**36.8**	5	16.3	7.4	8	0.1	0	**0**	0	
Acacia pendula	5	20	TG		5								
Rhagodia spinescens	1	20	SG			1							
Salsola australis	1	70	SG			1							
Teucrium racemosum	0.1	20	FG					0.1					
Enchylaena tomentosa	5	300	SG			5							
Duma florulenta	2	50	SG			2							
Einadia nutans subsp. *nutans*	5	500	FG					5					
Rytidosperma sp. (no fertile material)	1	60	GG				1						
Einadia nutans subsp. *linifolia*	2	60	FG					2					
Sclerolaena muricata var. *semiglabra*	1	20	SG			1							
Enteropogon acicularis	2	60	GG				2						
Atriplex semibaccata	1	70	SG			1							
Sida trichopoda	0.1	10	FG					0.1					
Maireana decalvans	5	300	SG			5							
Sclerolaena stelligera	0.1	10	SG			0.1							
Walwhalleya proluta	3	60	GG				3						
Euphorbia drummondii	0.1	10	FG					0.1					
Austrostipa scabra	0.8	30	GG				0.8						
Austrostipa aristiglumis	0.6	20	GG				0.6						
Roepera sp.	0.1	5	FG					0.1					
Maireana aphylla	0.2	5	SG			0.2							
Alternanthera nana	0.1	20	FG					0.1					
Marsilea drummondii	0.1	20	EG						0.1				
Solanum esuriale	0.1	10	FG					0.1					
Leiocarpa sp. (no fertile material)	0.1	5	FG					0.1					
Maireana pentagona	0.1	10	FG					0.1					
Vittadinia sp.	0.1	5	FG					0.1					
Calotis scabiosifolia var. *scabiosifolia*	0.1	20	FG					0.1					

Easting	378480
Northing	6130157
Orientation	150°
Plot size	10 X 40 X 100
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	1
20-29	No
10-19	Yes
5-9	Yes
<5	Yes
Hollows	0
Length logs (m)	14
BAM Attributes 1x1 plot (%)	
Litter (%)	9.6

Myall_02Remnant			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
PCT 26			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 24/03/25			23	21	1	8	5	7	0	0	2	1	
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum	
			38.1	**37.9**	5	25.7	0.7	6.5	0	0	**0.2**	0.1	
Acacia pendula	5	20	TG		5								
Rhagodia spinescens	15	100	SG			15							
Enchylaena tomentosa	5	300	SG			5							
Salsola australis	0.2	40	SG			0.2							
Austrostipa scabra	0.2	30	GG				0.2						
Atriplex semibaccata	1	50	SG			1							
Maireana decalvans	2	300	SG			2							
Rytidosperma sp. (no fertile material)	0.2	30	GG				0.2						
Maireana enchylaenoides	0.1	10	FG					0.1					
Walwhalleya proluta	0.1	10	GG				0.1						
Einadia nutans subsp. *nutans*	3	300	FG					3					
Solanum esuriale	0.1	5	FG					0.1					
Vittadinia sp.	0.1	5	FG					0.1					
Roepera sp.	0.1	5	FG					0.1					
*Lycium ferocissimum**	0.1	1	HT									0.1	
sclerolaena muricata var. *semiglabra*	0.4	20	SG			0.4							
*Hordeum leporinum**	0.1	5	EX								0.1		
Sclerolaena stelligera	0.1	5	SG			0.1							
Sporobolus caroli	0.1	5	GG				0.1						
Enteropogon acicularis	0.1	5	GG				0.1						
Sida trichopoda	0.1	5	FG					0.1					
Einadia nutans subsp. *linifolia*	3	300	FG					3					
Duma florulenta	2	20	SG			2							

Easting	378436
Northing	6130129
Orientation	155°
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	1
20-29	1
10-19	Yes
5-9	Yes
<5	Yes
Hollows	0
Length logs (m)	33
BAM Attributes 1x1 plot (%)	
Litter (%)	24.8

Myall_03PECe			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
PCT 26			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 24/3/25			19	18	1	7	5	5	0	0	1	0	
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum	
			14.4	**14.3**	2	5.4	6.4	0.5	0	0	**0.1**	0	
Acacia pendula	2	2	TG		2								
Austrostipa aristiglumis	2	30	GG				2						
Maireana aphylla	2	20	SG			2							
Sida trichopoda	0.1	10	FG					0.1					
Enteropogon acicularis	2	20	GG				2						
Maireana decalvans	2	30	SG			2							
Salsola australis	0.8	30	SG			0.8							
Maireana enchylaenoides	0.1	10	FG					0.1					
Rytidosperma sp. (No fertile material)	0.9	20	GG				0.9						
Atriplex semibaccata	0.2	20	SG			0.2							
Sclerolaena muricata var. *semiglabra*	0.2	20	SG			0.2							
Euphorbia drummondii	0.1	20	FG					0.1					
*Heliotropium europaeum**	0.1	5	EX								0.1		
Walwhalleya proluta	1	20	GG				1						
Austrostipa scabra	0.5	20	GG				0.5						
Solanum esuriale	0.1	10	FG					0.1					
Vittadinia sp.	0.1	5	FG					0.1					
Sclerolaena diacantha	0.1	5	SG			0.1							
Enchylaena tomentosa	0.1	5	SG			0.1							

Easting	373347
Northing	6136936
Orientation	170°
Plot size	10 X 40 X 100
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	2
10-19	No
5-9	No
<5	Yes
Hollows	0
Length logs (m)	2
BAM Attributes 1x1 plot (%)	
Litter (%)	32

Myall_03Remnant			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
PCT 26			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 24/03/2025			19	19	1	7	5	6	0	0	0	0	
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum	
			18.6	18.6	2	6.8	8.8	1	0	0	0	0	
Acacia pendula	2	4	TG		2								
Maireana aphylla	4	10	SG			4							
Austrostipa aristiglumis	5	40	GG				5						
Rytidosperma sp. (no fertile material)	1	100	GG				1						
Sclerolaena muricata var. *semiglabra*	0.3	20	SG			0.3							
Einadia nutans subsp. *nutans*	0.4	30	FG					0.4					
Atriplex semibaccata	0.8	30	SG			0.8							
Maireana pentagona	0.1	20	FG					0.1					
Salsola australis	0.2	40	SG			0.2							
Enchylaena tomentosa	0.3	30	SG			0.3							
Austrostipa scabra	0.4	30	GG				0.4						
Maireana enchylaenoides	0.2	30	FG					0.2					
Rhagodia spinescens	0.2	1	SG			0.2							
Sporobolus caroli	0.4	10	GG				0.4						
Leiocarpa sp. (no fertile material)	0.1	2	FG					0.1					
Solanum esuriale	0.1	5	FG					0.1					
Euphorbia drummondii	0.1	10	FG					0.1					
Maireana decalvans	1	30	SG			1							
Enteropogon acicularis	2	30	GG				2						

Easting	373347
Northing	6136936
Orientation	170°
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	1
20-29	2
10-19	Yes
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	24

Myall_04Remnant			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
PCT 26			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 23/03/25			17	16	1	7	3	4	0	1	1	1	
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum	
			44.4	44.3	10	15.4	2.7	15.2	0	1	0.1	0.1	
Acacia pendula	10	20	TG		10								
Amyema quandang var. *quandang*	1	1	OG							1			
Einadia nutans subsp. *nutans*	10	600	FG					10					
Maireana decalvans	4	60	SG			4							
Enchylaena tomentosa	5	60	SG			5							
Sclerolaena muricata var. *semiglabra*	1	30	SG			1							
Rhagodia spinescens	5	20	SG			5							
Enteropogon acicularis	2	40	GG				2						
Atriplex semibaccata	0.2	20	SG			0.2							
Salsola australis	0.1	10	SG			0.1							
Sclerolaena stelligera	0.1	10	SG			0.1							
Rytidosperma sp. (no fertile material)	0.6	50	GG				0.6						
Einadia nutans subsp. *linifolia*	5	400	FG					5					
Sida trichopoda	0.1	10	FG					0.1					
*Lycium ferocissimum**	0.1	1	HT									0.1	
Solanum esuriale	0.1	5	FG					0.1					
Austrostipa scabra	0.1	5	GG				0.1						

Easting	370999
Northing	6140377
Orientation	335°
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	3
20-29	6
10-19	Yes
5-9	No
<5	No
Hollows	0
Length logs (m)	16
BAM Attributes 1x1 plot (%)	
Litter (%)	32

Myall_04PECe			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
PCT 26			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 24/03/25			18	18	1	9	2	5	0	1	0	0	
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum	
			49.5	**49.5**	10	15.1	8	12.4	0	4	**0**	0	
Acacia pendula	10	20	TG		10								
Rhagodia spinescens	5	20	SG			5							
Amyema quandang var. *quandang*	4	5	OG							4			
Rytidosperma sp. (no fertile material)	3	100	GG				3						
Salsola australis	0.4	30	SG			0.4							
Einadia nutans subsp. *nutans*	10	1000	FG					10					
Enchylaena tomentosa	3	100	SG			3							
Maireana enchylaenoides	0.2	30	FG					0.2					
Atriplex semibaccata	0.8	30	SG			0.8							
Chenopodium nitrariaceum	0.8	1	SG			0.8							
Maireana decalvans	1	20	SG			1							
Sclerolaena muricata var. *semiglabra*	3	40	SG			3							
Sida trichopoda	0.1	10	FG					0.1					
Maireana aphylla	1	20	SG			1							
Enteropogon acicularis	5	50	GG				5						
Sclerolaena stelligera	0.1	10	SG			0.1							
Einadia nutans subsp. *linifolia*	2	30	FG					2					
Leiocarpa sp. (no fertile material)	0.1	10	FG					0.1					

Easting	371045
Northing	6140394
Orientation	330°
Plot size	10 X 40 X 100
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	1
20-29	6
10-19	Yes
5-9	No
<5	No
Hollows	0
Length logs (m)	26
BAM Attributes 1x1 plot (%)	
Litter (%)	31

Semi-arid Woodlands (Shrubby sub-formation)

Pine_01Remnant			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
PCT 22			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 21/03/25			15	12	1	4	4	2	0	1	3	1	
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum	
			86.2	83.4	1	4.1	78	0.2	0	0.1	2.8	1	
Allocasuarina luehmannii	1	1	TG		1								
Avena sp. (no fertile material)*	1	30	EX								1		
Enteropogon acicularis	20	100	GG				20						
Enneapogon nigricans	15	1000	GG				15						
Austrostipa nitida	40	1000	GG				40						
maireana georgei	1	10	SG			1							
*Bromus rubens**	0.8	50	EX								0.8		
Vittadinia sp.	0.1	10	FG					0.1					
Sida Corrugata	0.1	10	FG					0.1					
Austrostipa scabra	3	100	GG				3						
Sclerolaena diacantha	0.1	10	SG			0.1							
Maireana brevifolia	1	10	SG			1							
Enchylaena tomentosa	2	20	SG			2							
*Psilocaulon granulicaule**	1	20	HT									1	
Rhyncharrhena linearis	0.1	1	OG							0.1			

Easting	731595
Northing	6148431
Orientation	30°
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	1
50-79	1
30-49	1
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	10
BAM Attributes 1x1 plot (%)	
Litter (%)	36

Pine_01PECe			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 22			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 21/03/25			15	13	0	5	5	2	0	1	2	0
Species	**Cover**	**Abundance**	**Sum cover**	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			80.8	80.6	0	3.3	77	0.2	0	0.1	0.2	0
Maireana brevifolia	1	3	SG			1						
Enchylaena tomentosa	1	5	SG			1						
Convolvulus erubescens	0.1	10	OG							0.1		
Enteropogon acicularis	15	60	GG				15					
Enneapogon nigricans	20	1000	GG				20					
Austrostipa sp. (no fertile material)	1	100	GG				1					
Austrostipa scabra	1	100	GG				1					
*Sonchus oleraceus**	0.1	10	EX								0.1	
Sida corrugata	0.1	10	FG					0.1				
Maireana triptera	0.2	5	SG			0.2						
Vittadinia sp.	0.1	10	FG					0.1				
Sclerolaena obliquicuspis	0.1	10	SG			0.1						
Maireana georgei	1	3	SG			1						
*Bromus rubens**	0.1	10	EX								0.1	
Austrostipa nodosa	40	1000	GG				40					

54

Easting	731570
Northing	6148396
Orientation	310°
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	9
BAM Attributes 1x1 plot (%)	
Litter (%)	13.6

Pine_02PL			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 28			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 23/03/25			8	7	0	2	4	1	0	0	0	0
Species	**Cover**	**Abundance**	**Sum cover**	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			38.2	38.2	0	1.1	37	0.1	0	0	0	0
Austrostipa nitida	10	300	GG				10					
Eragrostis sp.	2	100	GG				2					
Austrostipa scabra	10	100	GG				10					
Enteropogon acicularis	15	500	GG				15					
Zaleya galericulata	0.1	10	FG					0.1				
Sclerolaena muricata var. *muricata*	1	1	SG			1						
Salsola australis	0.1	5	SG			0.1						

** most ground cover dead post summer

55

Easting	312475
Northing	6145212
Orientation	260°
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	22

Pine_02Remnant			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55	Easting	312477
PCT 28			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count		Northing	145093
Date: 23/03/25			10	6	1	2	1	2	0	0	3	1		Orientation	160°
Species	Cover	Abundance	Sum cove	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum		Plot size	20 X 20 X 50
			24.6	23.3	2	1.1	20	0.2	0	0	1.3	0.1		BAM Attributes 20x50m plot	
Callitris glaucophylla	2	1	TG		2									Stem classes	
Austrostipa nitida	20	600	GG				20							80+	0
*Hordeum leporinum**	1	1000	EX								1			50-79	1
Sclerolaena muricata var. muricata	1	1	SG			1								30-49	0
*Heliotropium europaeum**	0.2	30	EX								0.2			20-29	No
*Lycium ferocissimum**	0.1	1	HT									0.1		10-19	No
Zaleya galericulata	0.1	20	FG					0.1						5-9	No
Sida corrugata	0.1	10	FG					0.1						<5	No
Salsola australis	0.1	10	SG			0.1								Hollows	0
														Length logs (m)	12
** most ground cover dead post summer															
														BAM Attributes 1x1 plot (%)	
														Litter (%)	15

Pine_02PECe			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55	Easting	312471
PCT 28			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count		Northing	6145294
Date: 23/03/25			7	4	1	1	1	1	0	0	2	0		Orientation	°260
Species	Cover	Abundance	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum		Plot size	20 X 20 X 50
			8.5	8.2	4	0.1	4	0.1	0	0	0.3	0		BAM Attributes 20x50m plot	
*Hordeum leporinum**	0.1	1000	EX								0.1			Stem classes	
*Heliotropium europaeum**	0.2	20	EX								0.2			80+	0
Zaleya galericulata	0.1	40	FG					0.1						50-79	0
Austrostipa nitida	4	40	GG				4							30-49	0
Alectryon oleifolius	4	2	TG		4									20-29	No
Salsola australis	0.1	10	SG			0.1								10-19	No
														5-9	No
														<5	No
** most ground cover dead post summer														Hollows	0
														Length logs (m)	6
														BAM Attributes 1x1 plot (%)	
														Litter (%)	31.8

Pine_03PECe			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
PCT 28			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 24/03/2025			9	5	0	1	2	2	0	0	4	0	
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum	
			24.5	**22.3**	0	0.2	21	1.1	0	0	**2.2**	0	
Paspalidium sp. (no fertile material)	20	1000	GG				20						
Zaleya galericulata	1	30	FG					1					
*Tribulus terrestris**	1	30	EX								1		
Avena sp. (no fertile material)*	1	20	EX								1		
Enteropogon acicularis	1	20	GG				1						
Salsola australis	0.2	20	SG			0.2							
*Hordeum sp.**	0.1	10	EX								0.1		
*Conyza sp.**	0.1	5	EX								0.1		
Sida corrugata	0.1	1	FG					0.1					

Easting	377132
Northing	6131927
Orientation	145°
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	16
BAM Attributes 1x1 plot (%)	
Litter (%)	33

Pine_03Remnant			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
PCT 28			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 24/03/2025			18	7	1	2	4	0	0	0	11	3	
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum	
			12.3	**6.1**	2	0.6	3.5	0	0	0	**6.2**	3.2	
Callitris glaucophylla	2	1	TG		2								
*Hordeum sp.**	0.1	1000	EX								0.1		
*Heliotropium europaeum**	0.1	20	EX								0.1		
Paspalidium sp. (No fertile material)	2	30	GG				2						
*Lycium ferocissimum**	0.1	2	HT									0.1	
Eragrostis sp.	0.8	20	GG				0.8						
*Tribulus terrestris**	2	40	EX								2		
Atriplex semibaccata	0.4	10	SG			0.4							
*Conyza sp.**	0.1	5	EX								0.1		
Enteropogon acicularis	0.6	20	GG				0.6						
*Chenopodium murale**	0.1	10	EX								0.1		
*Xanthium spinosum**	0.1	5	HT									0.1	
*Malva parviflora**	0.1	5	EX								0.1		
*Alternanthera pungens**	3	40	HT									3	
Salsola australis	0.2	20	SG			0.2							
Avena sp. (no fertile material)*	0.4	20	EX								0.4		
*Cirsium vulgare**	0.1	5	EX								0.1		
Walwhalleya proluta	0.1	5	GG				0.1						

Easting	377084
Northing	6131872
Orientation	135°
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	1
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	20

BlackOak_01PL			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
PCT 58			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 19/03/2025			22	20	0	12	2	6	0	0	2	1	
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum	
			11.8	**11.4**	0	10.4	0.2	0.8	0	0	**0.4**	0.2	
Dodonaea viscosa subsp. *angustifolia*	4	20	SG			4							
Eremophila sturtii	2	10	SG			2							
Rhagodia spinescens	1	5	SG			1							
Vittadinia sp.	0.2	40	FG					0.2					
Sclerolaena diacantha	1	50	SG			1							
Ptilotus sessilifolius var. *sessilifolius*	0.5	30	SG			0.5							
*Carrichtera annua**	0.2	50	HT									0.2	
Enchylaena tomentosa	0.7	30	SG			0.7							
Malacocera tricornis	0.1	5	SG			0.1							
Maireana pentatropis	0.5	10	SG			0.5							
Sida corrugata	0.2	20	FG					0.2					
Sida trichopoda	0.1	10	FG					0.1					
*Asphodelus fistulosus**	0.2	10	EX								0.2		
Austrostipa nitida	0.1	5	GG				0.1						
Sclerolaena obliquicuspis	0.1	10	SG			0.1							
Atriplex stipitata subsp. *miscella*	0.1	5	SG			0.1							
Solanum coactiliferum	0.1	5	FG					0.1					
Brachyscome sp. (No fertile material)	0.1	5	FG					0.1					
Einadia nutans	0.1	5	FG					0.1					
Rytidosperma sp. (No fertile material)	0.1	5	GG				0.1						
Acacia wilhelmiana	0.2	1	SG			0.2							
Eremophila glabra	0.2	1	SG			0.2							

Easting	622054
Northing	6218520
Orientation	315°
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	5

BlackOak_01PECe			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
PCT 58			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 19/03/2025			28	26	1	20	2	3	0	0	2	1	
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum	
			13.8	**13.6**	0.1	13	0.2	0.3	0	0	**0.2**	0.1	
Dodonaea viscosa subsp. *angustifolia*	2	2	SG			2							
Myoporum platycarpum subsp. *platycarpum*	2	3	SG			2							
Rhagodia spinescens	2	10	SG			2							
Enchylaena tomentosa	0.1	5	SG			0.1							
Eremophila sturtii	1	1	SG			1							
Sclerolaena diacantha	0.8	30	SG			0.8							
Austrostipa nitida	0.1	5	GG				0.1						
*Carrichtera annua**	0.1	10	HT									0.1	
Atriplex stipitata subsp. *miscella*	0.1	10	SG			0.1							
Ptilotus sessilifolius var. *sessilifolius*	0.5	20	SG			0.5							
Sclerolaena obliquicuspis	0.5	20	SG			0.5							
*Heliotropium europaeum**	0.1	5	EX								0.1		
Maireana brevifolia	0.1	5	SG			0.1							
Maireana pentatropis	0.1	5	SG			0.1							
Chenopodium curvispicatum	1	10	SG			1							
Maireana georgei	0.3	20	SG			0.3							
Dissocarpus paradoxus	0.1	5	SG			0.1							
Sida corrugata	0.1	10	FG					0.1					
Vittadinia sp.	0.1	10	FG					0.1					
Paspalidium constrictum	0.1	5	GG				0.1						
Brachyscome sp. (No fertile material)	0.1	5	FG					0.1					
Acacia oswaldii	0.1	2	TG		0.1								
Maireana sclerolaenoides	0.1	5	SG			0.1							
Maireana triptera	0.1	5	SG			0.1							
Sida intricata	0.1	5	SG			0.1							
Olearia pimeleoides	1	1	SG			1							
Pimelea microcephala subsp. *microcephala*	1	1	SG			1							
Acacia colletioides	0.1	1	SG			0.1							

Easting	622107
Northing	6218569
Orientation	145°
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	31
BAM Attributes 1x1 plot (%)	
Litter (%)	23.4

BlackOak_01Remnant			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
PCT 58			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 19/03/2025			28	27	1	17	4	5	0	0	1	1	
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum	
			13.5	**13.4**	4	8.3	0.5	0.6	0	0	**0.1**	0.1	
Casuarina pauper	4	2	TG		4								
Sida corrugata	0.2	20	FG					0.2					
Sarcozona praecox	0.1	5	FG					0.1					
Sclerolaena diacantha	0.8	30	SG			0.8							
Rytidosperma sp. (No fertile material)	0.1	10	GG				0.1						
Austrostipa nitida	0.1	10	GG				0.1						
Dissocarpus paradoxus	0.1	5	SG			0.1							
Rhagodia spinescens	1	5	SG			1							
Roepera eremaea	0.1	5	FG					0.1					
Maireana sclerolaenoides	0.2	20	SG			0.2							
Atriplex stipitata subsp. *stipitata*	0.5	5	SG			0.5							
Atriplex stipitata subsp. *miscella*	0.1	10	SG			0.1							
Vittadinia sp.	0.1	10	FG					0.1					
Dodonaea viscosa subsp. *angustissima*	0.3	2	SG			0.3							
Ptilotus sessilifolius var. *sessilifolius*	0.1	5	SG			0.1							
Exocarpos aphyllus	0.2	1	SG			0.2							
*Carrichtera annua**	0.1	10	HT									0.1	
Brachyscome sp. (No fertile material)	0.1	10	FG					0.1					
Sclerolaena obliquicuspis	0.2	20	SG			0.2							
Enchylaena tomentosa	1	30	SG			1							
Myoporum platycarpum subsp. *platycarpum*	1	2	SG			1							
Senna artemisioides subsp. *coriacea*	1	2	SG			1							
Acacia spp.	0.3	1	SG			0.3							
Paspalidium constrictum	0.1	5	GG				0.1						
Austrostipa elegantissima	0.2	10	GG				0.2						
Pimelea microcephala subsp. *microcephala*	0.8	1	SG			0.8							
Olearia pimeleoides	0.4	1	SG			0.4							
Chenopodium curvispicatum	0.3	5	SG			0.3							

Easting	622133
Northing	6218600
Orientation	140°
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	1
30-49	1
20-29	No
10-19	Yes
5-9	Yes
<5	Yes
Hollows	0
Length logs (m)	18
BAM Attributes 1x1 plot (%)	
Litter (%)	13

BlackOak_02PECe			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54	Easting	758929
PCT 58			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count		Northing	6144651
Date: 22/03/25			16	16	2	10	1	3	0	0	0	0		Orientation	255°
Species	Cover	Abundance	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum		Plot size	10 X 40 X 100
			17.1	17.1	0.4	16.3	0.1	0.3	0	0	0	0		BAM Attributes 10x100m plot	
Rhagodia spinescens	5	20	SG			5								Stem classes	
Maireana brevifolia	5	30	SG			5								80+	0
Chenopodium desertorum subsp. desertorum	0.7	10	SG			0.7								50-79	0
Enchylaena tomentosa	3	60	SG			3								30-49	0
Alectryon oleifolius subsp. canescens	0.3	10	TG		0.3									20-29	No
Nitraria billardierei	0.8	2	SG			0.8								10-19	No
Salsola australis	0.1	10	SG			0.1								5-9	No
Cressa australis	0.1	10	FG					0.1						<5	Yes
Einadia nutans	0.1	5	FG					0.1						Hollows	0
Maireana georgei	0.2	20	SG			0.2								Length logs (m)	92
Sida corrugata	0.1	10	FG					0.1							
Sclerolaena diacantha	0.3	20	SG			0.3								BAM Attributes 1x1 plot (%)	
Austrostipa scabra	0.1	10	GG				0.1							Litter (%)	68
Maireana pyramidata	1	10	SG			1									
Casuarina pauper	0.1	10	TG		0.1										
Maireana aphylla	0.2	10	SG			0.2									

BlackOak_02Remnant			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54	Easting	758927
PCT 58			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count		Northing	6144712
Date: 22/03/25			14	14	2	10	0	1	0	1	0	0		Orientation	270°
Species	Cover	Abundance	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum		Plot size	20 X 20 X 50
			35.6	35.6	5	29.9	0	0.2	0	0.5	0	0		BAM Attributes 20x50m plot	
Casuarina pauper	2	1	TG		2									Stem classes	
Alectryon oleifolius subsp. canescens	3	5	TG		3									80+	0
Maireana pyramidata	20	100	SG			20								50-79	0
Enchylaena tomentosa	2	30	SG			2								30-49	2
Rhagodia spinescens	4	30	SG			4								20-29	1
Nitraria billardierei	3	20	SG			3								10-19	Yes
Malacocera tricornis	0.4	20	SG			0.4								5-9	No
Sclerolaena tricuspis	0.1	10	SG			0.1								<5	No
Salsola australis	0.1	10	SG			0.1								Hollows	0
Sclerolaena brachyptera	0.1	20	SG			0.1								Length logs (m)	5
Einadia nutans	0.2	20	FG					0.2							
Sclerolaena diacantha	0.1	20	SG			0.1								BAM Attributes 1x1 plot (%)	
Amyema linophylla subsp. orientalis	0.5	1	OG							0.5				Litter (%)	2.6
Maireana georgei	0.1	20	SG			0.1									

BlackOak_03Remnant			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
PCT 58			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 22/03/25			12	11	1	7	1	1	0	1	1	1	
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum	
			12.8	**12.7**	3	8.4	0.2	0.1	0	1	**0.1**	0.1	
Alectryon oleifolius subsp. canescens	3	7	TG		3								
Nitraria billardierei	5	30	SG			5							
Sclerolaena diacantha	1	60	SG			1							
Carrichtera annua	0.1	30	HT									0.1	
Austrostipa nitida	0.2	20	GG				0.2						
Enchylaena tomentosa	1	40	SG			1							
Maireana brevifolia	1	40	SG			1							
Einadia nutans	0.1	10	FG					0.1					
Sclerolaena patenticuspis	0.2	30	SG			0.2							
Lysiana exocarpi subsp. exocarpi	1	1	OG							1			
Sclerolaena brachyptera	0.1	10	SG			0.1							
Atriplex sp.	0.1	5	SG			0.1							

Easting	745290
Northing	6146210
Orientation	80°
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	1
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	72
BAM Attributes 1x1 plot (%)	
Litter (%)	21

BlackOak_03PL			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
PCT 58			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 22/03/25			13	10	0	7	1	2	0	0	3	1	
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum	
			15.7	**15.4**	0	14.2	1	0.2	0	0	**0.3**	0.1	
Nitraria billardierei	10	50	SG			10							
Sclerolaena diacantha	1	50	SG			1							
*Carrichtera annua**	0.1	20	HT									0.1	
Enteropogon acicularis	1	30	GG				1						
Maireana brevifolia	1	50	SG			1							
Dissocarpus paradoxus	0.1	5	SG			0.1							
Enchylaena tomentosa	1	50	SG			1							
*Hordeum leporinum**	0.1	1000	EX								0.1		
Sclerolaena obliquicuspis	0.1	10	SG			0.1							
*Heliotropium europaeum**	0.1	20	EX								0.1		
Solanum esuriale	0.1	10	FG					0.1					
Einadia nutans	0.1	10	FG					0.1					
Rhagodia spinescens	1	20	SG			1							

Easting	745310
Northing	6146096
Orientation	105°
Plot size	10 X 40 X 100
BAM Attributes 10x100m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	65

BlackOak_03PECe			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
PCT 58			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 22/03/25			14	12	2	7	1	2	0	0	2	2	
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum	
			11.5	**9.4**	4	5.1	0.1	0.2	0	0	**2.1**	2.1	
Casuarina pauper	1	1	TG		1								
Alectryon oleifolius subsp. canescens	3	4	TG		3								
*Psilocaulon granulicaule**	2	1000	HT									2	
Enchylaena tomentosa	1	50	SG			1							
Sclerolaena diacantha	0.1	10	SG			0.1							
Einadia nutans	0.1	10	FG					0.1					
*Carrichtera annua**	0.1	20	HT									0.1	
Maireana brevifolia	0.8	20	SG			0.8							
Rhagodia spinescens	0.3	10	SG			0.3							
Nitraria billardierei	2	20	SG			2							
Maireana pyramidata	0.8	10	SG			0.8							
Austrostipa nitida	0.1	20	GG				0.1						
Solanum esuriale	0.1	10	FG					0.1					
Sclerolaena patenticuspis	0.1	10	SG			0.1							

Easting	745284
Northing	6146183
Orientation	105°
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	1
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	11
BAM Attributes 1x1 plot (%)	
Litter (%)	25

Grassy_02Remnant			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
PCT 75			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 25/03/25			26	26	3	3	10	8	1	1	0	0	
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum	
			52.9	**52.9**	17	1.2	32.1	2.4	0.1	0.1	**0**	0	
Eucalyptus melliodora	5	3	TG		5								
Callitris glaucophylla	10	20	TG		10								
Austrostipa scabra subsp. *scabra*	10	500	GG				10						
Elymus scaber	10	500	GG				10						
Sida corrugata	0.1	20	FG					0.1					
Einadia nutans subsp. *linifolia*	0.8	20	FG					0.8					
Einadia nutans subsp. *nutans*	1	40	FG					1					
Rytidosperma caespitosum	5	100	GG				5						
Maireana enchylaenoides	0.1	10	FG					0.1					
Lomandra confertifolia	0.1	10	GG				0.1						
Brachychiton populneus subsp. *populneus*	2	1	TG		2								
Cheilanthes sieberi	0.1	10	EG						0.1				
Acacia brachybotrya	1	1	SG			1							
Rytidosperma caespitosum	5	100	GG				5						
Atriplex spinibractea	0.1	20	FG					0.1					
Sida trichopoda	0.1	10	FG					0.1					
Maireana microphylla	0.1	5	SG			0.1							
Chenopodium desertorum subsp. *microphyllum*	0.1	5	SG			0.1							
Enteropogon acicularis	0.2	10	GG				0.2						
Austrostipa elegantissima	0.1	5	GG				0.1						
Vittadinia sp.	0.1	5	FG					0.1					
Aristida behriana	0.6	20	GG				0.6						
Austrostipa nodosa	1	20	GG				1						
Euphorbia drummondii	0.1	10	FG					0.1					
Glycine sp.	0.1	5	OG							0.1			
Lomandra multiflora	0.1	5	GG				0.1						

Easting	446404
Northing	6100474
Orientation	285°
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	2
50-79	0
30-49	2
20-29	0
10-19	0
5-9	0
<5	0
Hollows	3
Length logs (m)	28
BAM Attributes 1x1 plot (%)	
Litter (%)	32

Grassy_02PECe			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55H
PCT 75			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 25/03/25			32	24	3	3	6	10	1	1	8	0	
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum	
			20.1	**18**	0.4	0.3	12.7	4.4	0.1	0.1	**2.1**	0	
Sida corrugata	3	30	FG					3					
Maireana enchylaenoides	0.2	10	FG					0.2					
Einadia nutans	0.5	10	FG					0.5					
Austrostipa scabra	12	100	GG				12						
Einadia hastata	0.1	10	FG					0.1					
Lomandra confertifolia	0.2	30	GG				0.2						
*Cirsium vulgare**	0.1	10	EX								0.1		
*Sisymbrium orientale**	0.5	10	EX								0.5		
Rytidosperma setaceum	0.2	10	GG				0.2						
*Schismus barbatus**	0.1	5	EX								0.1		
*Petrorhagia nanteuilii**	0.1	5	EX								0.1		
*Medicago polymorpha**	0.1	5	EX								0.1		
Euphorbia drummondii	0.1	5	FG					0.1					
Oxalis perennans	0.1	5	FG					0.1					
Vittadinia sp.	0.1	5	FG					0.1					
Chenopodium desertorum	0.1	5	SG			0.1							
Linum marginale	0.1	5	FG					0.1					
Cheilanthes sieberi	0.1	5	EG						0.1				
Callitris glaucophylla	0.1	5	TG		0.1								
*Heliotropium europaeum**	0.1	5	EX								0.1		
*Lolium perenne**	1	5	EX								1		
Sclerolaena muricata var. *semiglabra*	0.1	5	SG			0.1							
Sida sp.	0.1	5	FG					0.1					
Allocasuarina luehmannii	0.1	5	TG		0.1								
Austrostipa bigeniculata	0.1	5	GG				0.1						
Lomandra multiflora	0.1	5	GG				0.1						
Paspalidium sp. (No fertile material)	0.1	5	GG				0.1						
Convolvulus sp.	0.1	5	OG							0.1			
Dysphania pumilio	0.1	5	FG					0.1					
Eucalyptus melliodora	0.2	1	TG		0.2								
*Conyza sp.**	0.1	5	EX								0.1		
Dissocarpus paradoxus	0.1	5	SG			0.1							

Easting	446382
Northing	6100390
Orientation	285° *assumed
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
	75

Grassy_04Remnant			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55	Easting	467334
PCT 75			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count		Northing	6098939
Date: 25/03/25			12	12	3	1	4	3	1	0	0	0		Orientation	60°
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum		**Plot size**	20 X 20 X 50
			24	24	19	0.5	4	0.4	0.1	0	0	0		BAM Attributes 20x50m plot	
Eucalyptus microcarpa	3	2	TG		3									Stem classes	
Callitris glaucophylla	15	100	TG		15									80+	1
Austrostipa scabra subsp. *scabra*	3	60	GG				3							50-79	0
Lomandra confertifolia	0.2	20	GG				0.2							30-49	0
Maireana enchylaenoides	0.1	20	FG					0.1						20-29	2
Einadia nutans subsp. *nutans*	0.2	10	FG					0.2						10-19	Yes
Cheilanthes sieberi	0.1	5	EG						0.1					5-9	Yes
Rytidosperma caespitosum	0.6	30	GG				0.6							<5	Yes
Lomandra multiflora	0.2	20	GG				0.2							Hollows	1
Sida corrugata	0.1	10	FG					0.1						Length logs (m)	32
Brachychiton populneus subsp. *populneus*	1	1	TG		1										
Chenopodium desertorum subsp. *microphyllum*	0.5	20	SG			0.5								BAM Attributes 1x1 plot (%)	
														Litter (%)	46

Grassy_04PECe			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55H
PCT 75			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 25/03/25			25	19	2	2	8	6	1	0	6	0	
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum	
			19.1	**18.3**	0.4	0.3	15.8	1.6	0.2	0	**0.8**	0	
Sida corrugata	1	20	FG					1					
Eucalyptus sp. (regrowth)	0.3	2	TG		0.3								
*Heliotropium europaeum**	0.1	10	EX								0.1		
*Conyza sumatrensis**	0.2	10	EX								0.2		
Austrostipa scabra	15	100	GG				15						
Chenopodium desertorum subsp. *microphyllum*	0.2	10	SG			0.2							
Lomandra confertifolia	0.2	20	GG				0.2						
Wahlenbergia sp.	0.1	5	FG					0.1					
Maireana enchylaenoides	0.1	5	FG					0.1					
*Romulea minutiflora**	0.1	5	EX								0.1		
Rytidosperma caespitosum	0.1	5	GG				0.1						
Cheilanthes sieberi	0.2	25	EG						0.2				
Einadia nutans	0.2	10	FG					0.2					
Elymus scaber	0.1	10	GG				0.1						
Vittadinia cuneata var. *hirsuta*	0.1	15	FG					0.1					
*Cirsium vulgare**	0.1	5	EX								0.1		
Callitris glaucophylla	0.1	5	TG		0.1								
*Chondrilla juncea**	0.1	5	EX								0.1		
Vittadinia sp.	0.1	5	FG					0.1					
Rytidosperma sp. (no fertile material)	0.1	5	GG				0.1						
*Medicago polymorpha**	0.2	20	EX								0.2		
Lomandra multiflora	0.1	5	GG				0.1						
Aristida behriana	0.1	5	GG				0.1						
Sclerolaena muricata var. *semiglabra*	0.1	5	SG			0.1							
Austrostipa bigeniculata	0.1	5	GG				0.1						

Easting	467378
Northing	6098929
Orientation	240° *assumed
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	6
BAM Attributes 1x1 plot (%)	
Litter (%)	63

Mallee_01PL			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
PCT 172			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 20/03/2025			17	17	2	5	6	4	0	0	0	0	
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum	
			40.1	40.1	1.2	2.7	35.8	0.4	0	0	0	0	
Eucalyptus dumosa	1	1	TG		1								
Triodia scariosa subsp. *scariosa*	25	100	GG				25						
Dodonaea viscosa subsp. *angustissima*	2	5	SG			2							
Schoenus subaphyllus	10	300	GG				10						
Sclerolaena parviflora	0.2	10	SG			0.2							
Cryptandra magniflora	0.1	5	SG			0.1							
Solanum esuriale	0.1	20	FG					0.1					
Goodenia sp.	0.1	50	FG					0.1					
Lomandra effusa	0.3	5	GG				0.3						
Chrysocephalum apiculatum	0.1	5	FG					0.1					
Rytidosperma sp. (no fertile material)	0.1	10	GG				0.1						
Gahnia lanigera	0.3	5	GG				0.3						
Austrostipa platychaeta	0.1	1	GG				0.1						
Eremophila glabra	0.2	3	SG			0.2							
Podolepis capillaris	0.1	10	FG					0.1					
Halgania cyanea	0.2	20	SG			0.2							
Callitris verrucosa	0.2	2	TG		0.2								

Easting	623368
Northing	6216761
Orientation	145°
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	Yes
5-9	No
<5	Yes
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	14.2

Mallee_01PECe			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
PCT 172			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 20/03/2025			15	15	4	4	4	3	0	0	0	0	
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum	
			32.6	**32.6**	19	0.9	12.3	0.4	0	0	**0**	0	
Callitris verrucosa	10	5	TG		10								
Eucalyptus socialis	4	3	TG		4								
Eucalyptus dumosa	4	5	TG		4								
Eucalyptus costata	1	3	TG		1								
Triodia scariosa subsp. *scariosa*	10	100	GG				10						
Schoenus subaphyllus	2	100	GG				2						
Sclerolaena parviflora	0.2	30	SG			0.2							
Podolepis capillaris	0.1	10	FG					0.1					
Goodenia sp.	0.2	30	FG					0.2					
Gahnia lanigera	0.2	10	GG				0.2						
Chrysocephalum apiculatum	0.1	10	FG					0.1					
Chenopodium curvispicatum	0.4	5	SG			0.4							
Enchylaena tomentosa	0.2	5	SG			0.2							
Austrostipa spp.	0.1	5	GG				0.1						
Halgania cyanea	0.1	40	SG			0.1							

Easting	623424
Northing	6216764
Orientation	145°
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	Yes
10-19	Yes
5-9	Yes
<5	No
Hollows	0
Length logs (m)	3
BAM Attributes 1x1 plot (%)	
Litter (%)	24

Mallee_01Remnant			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
PCT 172			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 20/03/2025			15	15	5	6	3	1	0	0	0	0	
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum	
			23.6	**23.6**	20	3.1	0.4	0.1	0	0	**0**	0	
Callitris verrucosa	3	4	TG		3								
Eucalyptus socialis	5	10	TG		5								
Eucalyptus dumosa	5	10	TG		5								
Eucalyptus costata	5	10	TG		5								
Eucalyptus leptophylla	2	5	TG		2								
Dodonaea viscosa subsp. *angustissima*	0.5	1	SG			0.5							
Dodonaea bursariifolia	2	5	SG			2							
Halgania cyanea	0.1	20	SG			0.1							
Sclerolaena parviflora	0.1	10	SG			0.1							
Lomandra effusa	0.2	2	GG				0.2						
Chenopodium desertorum subsp. *desertorum*	0.1	1	SG			0.1							
Podolepis capillaris	0.1	10	FG					0.1					
Austrostipa spp.	0.1	1	GG				0.1						
Gahnia lanigera	0.1	5	GG				0.1						
Grevillea huegelii	0.3	1	SG			0.3							

Easting	623478
Northing	6216793
Orientation	140°
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	Yes
10-19	Yes
5-9	Yes
<5	Yes
Hollows	0
Length logs (m)	11
BAM Attributes 1x1 plot (%)	
Litter (%)	13.2

Mallee_02PL			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54	Easting	626656
PCT 170			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count		Northing	6212392
Date: 20/03/2025			29	24	0	16	4	4	0	0	5	1		Orientation	310°
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum		**Plot size**	20 X 20 X 50
			27.5	**25**	0	24.1	0.4	0.5	0	0	**2.5**	0.1		**BAM Attributes 20x50m plot**	
Maireana triptera	5	60	SG			5								**Stem classes**	
Sida intricata	0.3	10	SG			0.3								**80+**	0
*Carrichtera annua**	0.1	40	HT									0.1		**50-79**	0
Sclerolaena diacantha	3	100	SG			3								**30-49**	0
Sclerolaena obliquicuspis	5	100	SG			5								**20-29**	No
Austrostipa nitida	0.1	5	GG				0.1							**10-19**	No
Rytidosperma sp. (no fertile material)	0.1	10	GG				0.1							**5-9**	No
Dissocarpus paradoxus	3	50	SG			3								**<5**	No
Enchylaena tomentosa	1	20	SG			1								**Hollows**	0
Maireana brevifolia	4	30	SG			4								**Length logs (m)**	2
Solanum esuriale	0.2	30	FG					0.2							
Tragus australianus	0.1	5	GG				0.1							**BAM Attributes 1x1 plot (%)**	
*Heliotropium europaeum**	1	50	EX								1			**Litter (%)**	29
Eragrostis sp.	0.1	10	GG				0.1								
Atriplex stipitata subsp. *miscella*	0.1	5	SG			0.1									
Eremophila glabra	0.8	3	SG			0.8									
Enchylaena tomentosa	1	20	SG			1									
Euphorbia drummondii	0.1	10	FG					0.1							
*Cucumis myriocarpus**	0.2	10	EX								0.2				
Abutilon halophilum	0.1	5	SG			0.1									
Atriplex stipitata subsp. *stipitata*	0.3	5	SG			0.3									
*Asphodelus fistulosus**	0.2	10	EX								0.2				
Vittadinia sp.	0.1	5	FG					0.1							
Malacocera tricornis	0.2	5	SG			0.2									
*Tribulus terrestris**	1	30	EX								1				
Salsola australis	0.1	5	SG			0.1									
Chenopodium desertorum subsp. *desertorum*	0.1	5	SG			0.1									
Roepera aurantiaca	0.1	2	FG					0.1							
Acacia colletioides	0.1	1	SG			0.1									

Mallee_02PECe			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
PCT 170			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 20/03/2025			22	20	2	12	3	3	0	0	1	1	
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum	
			13.1	8	1.2	5.8	0.3	0.7	0	0	0.1	0.1	
Eucalyptus leptophylla	0.2	1	TG		0.2								
Eucalyptus oleosa subsp. *oleosa*	1	1	TG		1								
Atriplex stipitata subsp. *stipitata*	0.2	10	SG			0.2							
Sclerolaena obliquicuspis	1	30	SG			1							
Roepera aurantiaca	0.3	20	FG					0.3					
Chenopodium curvispicatum	0.1	5	SG			0.1							
Maireana pentatropis	1	30	SG			1							
*Carrichtera annua**	0.1	20	HT									0.1	
Roepera apiculata	0.3	30	FG					0.3					
Maireana triptera	1	20	SG			1							
Austrostipa nitida	0.1	10	GG				0.1						
Sclerolaena diacantha	1	60	SG			1							
Salsola australis	0.1	5	SG			0.1							
Malacocera tricornis	0.1	10	SG			0.1							
Sclerolaena stelligera	0.5	50	SG			0.5							
Solanum coactiliferum	0.1	5	FG					0.1					
Austrostipa platychaeta	0.1	5	GG				0.1						
Senna artemisioides subsp. *filifolia*	0.1	1	SG			0.1							
Rytidosperma sp. (no fertile material)	0.1	5	GG				0.1						
Chenopodium nitrariaceum	0.6	1	SG			0.6							
Dissocarpus paradoxus	0.1	10	SG			0.1							
Eucalyptus spp. (regrowth subject to spray & excluded from VI)	5	10											

Easting	626683
Northing	6212427
Orientation	325°
Plot size	10 X 40 X 100
BAM Attributes 10x100m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	Yes
10-19	Yes
5-9	No
<5	No
Hollows	0
Length logs (m)	18
BAM Attributes 1x1 plot (%)	
Litter (%)	29.4

Mallee_02Remnant			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
PCT 170			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 20/03/2025			23	23	3	16	2	2	0	0	0	0	
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum	
			21.3	21.3	7	11.1	1.1	2.1	0	0	0	0	
Eucalyptus dumosa	2	2	TG		2								
Eucalyptus leptophylla	4	2	TG		4								
Eucalyptus oleosa subsp. *oleosa*	1	1	TG		1								
Malacocera tricornis	1	20	SG			1							
Sclerolaena obliquicuspis	1	40	SG			1							
Roepera aurantiaca	0.1	10	FG					0.1					
Roepera apiculata	2	40	FG					2					
Sclerolaena diacantha	1	40	SG			1							
Maireana triptera	1	30	SG			1							
Maireana erioclada	2	50	SG			2							
Pimelea microcephala subsp. *microcephala*	0.6	10	SG			0.6							
Enchylaena tomentosa	0.4	20	SG			0.4							
Chenopodium curvispicatum	0.2	5	SG			0.2							
Atriplex stipitata subsp. *miscella*	0.1	10	SG			0.1							
Austrostipa nitida	0.1	5	GG				0.1						
Austrostipa platychaeta	1	20	GG				1						
Salsola australis	0.1	5	SG			0.1							
Dissocarpus paradoxus	0.1	10	SG			0.1							
Maireana brevifolia	1	20	SG			1							
Eremophila glabra	1	5	SG			1							
Exocarpos aphyllus	0.5	1	SG			0.5							
Atriplex stipitata subsp. *stipitata*	0.1	5	SG			0.1							
Maireana pentatropis	1	30	SG			1							

Easting	626739
Northing	6212482
Orientation	60°
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	Yes
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	3
BAM Attributes 1x1 plot (%)	
Litter (%)	49

Mallee_03Remnant			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
PCT 171			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 21/03/25			14	14	5	4	4	1	0	0	0	0	
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum	
			31	31	10	0.5	20.4	0.1	0	0	0	0	
Eucalyptus leptophylla	5	6	TG		5								
Eucalyptus socialis	1	1	TG		1								
Eucalyptus dumosa	1	1	TG		1								
Triodia scariosa	20	50	GG				20						
Callitris verrucosa	2	3	TG		2								
Callitris gracilis subsp. *murrayensis*	1	1	TG		1								
Halgania cyanea	0.1	5	SG			0.1							
Lomandra leucocephala subsp. *robusta*	0.1	5	GG				0.1						
Austrostipa nitida	0.1	5	GG				0.1						
Schoenus subaphyllus	0.2	10	GG				0.2						
Cryptandra magniflora	0.2	3	SG			0.2							
Wahlenbergia sp.	0.1	2	FG					0.1					
Sclerolaena parviflora	0.1	10	SG			0.1							
Olearia lepidophylla	0.1	1	SG			0.1							

Easting	647631
Northing	6184648
Orientation	140°
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	Yes
5-9	Yes
<5	Yes
Hollows	0
Length logs (m)	23
BAM Attributes 1x1 plot (%)	
Litter (%)	29

Mallee_03PECe			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
PCT 171			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 21/03/2025			16	16	5	6	4	1	0	0	0	0	
Species	**Cover**	**Abundance**	**Sum cover**	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	
			19.4	19.4	8	0.9	10.4	0.1	0	0	0	0	
Triodia scariosa	10	50	GG				10						
Austrostipa nitida	0.1	5	GG				0.1						
Lomandra leucocephala subsp. *robusta*	0.1	10	GG				0.1						
Schoenus subaphyllus	0.2	10	GG				0.2						
Vittadinia gracilis	0.1	10	FG					0.1					
Callitris verrucosa	1	2	TG		1								
Eucalyptus costata	1	3	TG		1								
Sclerolaena diacantha	0.1	10	SG			0.1							
Sclerolaena parviflora	0.1	20	SG			0.1							
Eucalyptus leptophylla	2	3	TG		2								
Eucalyptus socialis	2	3	TG		2								
Chenopodium curvispicatum	0.1	1	SG			0.1							
Callitris gracilis subsp. *murrayensis*	2	3	TG		2								
Halgania cyanea	0.1	5	SG			0.1							
Dodonaea viscosa subsp. *angustifolia*	0.4	1	SG			0.4							
Eremophila sp.	0.1	2	SG			0.1							

Easting	647597
Northing	6184610
Orientation	130°
Plot size	10 X 40 X 100
BAM Attributes 10x100m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	2
10-19	Yes
5-9	Yes
<5	Yes
Hollows	0
Length logs (m)	33
BAM Attributes 1x1 plot (%)	
Litter (%)	26

Grassy Woodlands

Grassy_01Remnant			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
PCT 80			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 25/03/2025			23	22	2	3	8	8	1	0	1	1	
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum	
			30.3	30.2	12	3.1	8.5	6.5	0.1	0	0.1	0.1	
Eucalyptus microcarpa	2	1	TG		2								
Callitris glaucophylla	10	40	TG		10								
Sclerolaena muricata var. *semiglabra*	1	10	SG			1							
Einadia nutans subsp. *nutans*	2	30	FG					2					
Austrostipa nodosa	4	60	GG				4						
Sida corrugata	0.1	10	FG					0.1					
Enteropogon acicularis	2	30	GG				2						
Calotis cuneifolia	1	30	FG					1					
Rytidosperma caespitosum	0.8	20	GG				0.8						
Dichondra repens	0.1	20	FG					0.1					
Panicum decompositum	0.1	10	GG				0.1						
Austrostipa scabra subsp. *scabra*	0.6	20	GG				0.6						
*Olea europaea**	0.1	1	HT									0.1	
Einadia nutans subsp. *linifolia*	3	50	FG					3					
Maireana enchylaenoides	0.1	20	FG					0.1					
Maireana microphylla	2	10	SG			2							
Oxalis perennans	0.1	10	FG					0.1					
Atriplex spinibractea	0.1	20	FG					0.1					
Cheilanthes sieberi	0.1	5	EG						0.1				
Rytidosperma setaceum	0.8	30	GG				0.8						
Eremophila debilis	0.1	5	SG			0.1							
Elymus scaber	0.1	5	GG				0.1						
Lomandra confertifolia	0.1	5	GG				0.1						

Easting	444263
Northing	6100730
Orientation	270°
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	1
50-79	0
30-49	0
20-29	0
10-19	0
5-9	0
<5	0
Hollows	1
Length logs (m)	24
BAM Attributes 1x1 plot (%)	
Litter (%)	39

Grassy01_PECe			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55H
PCT 80			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 25/03/2025			27	22	1	2	11	8	0	0	5	0	
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum	
			31.6	30.9	2	0.2	26.6	2.1	0	0	0.7	0	
Austrostipa scabra	5	50	GG				5						
Calotis cuneifolia	1	50	FG					1					
Elymus scaber	0.5	20	GG				0.5						
Chloris truncata	15	100	GG				15						
Sida corrugata	0.3	30	FG					0.3					
Austrostipa bigeniculata	0.1	10	GG				0.1						
Rytidosperma caespitosum	5	50	GG				5						
Dianella revoluta	0.1	5	FG					0.1					
Eragrostis australasica	0.2	5	GG				0.2						
Lomandra confertifolia	0.2	10	GG				0.2						
*Romulea sp.**	0.1	1	EX								0.1		
Lomandra multiflora	0.2	10	GG				0.2						
Eucalyptus microcarpa	2	6	TG		2								
Einadia nutans	0.2	15	FG					0.2					
Rytidosperma setaceum	0.2	20	GG				0.2						
*Lolium perenne**	0.3	30	EX								0.3		
Sida sp.	0.2	15	FG					0.2					
Oxalis perennans	0.1	5	FG					0.1					
*Plantago lanceolata**	0.1	5	EX								0.1		
Paspalidium sp. (No fertile material)	0.1	5	GG				0.1						
Maireana enchylaenoides	0.1	5	FG					0.1					
Sporobolus caroli	0.1	5	GG				0.1						
Atriplex semibaccata	0.1	5	SG			0.1							
*Conyza bonariensis**	0.1	5	EX								0.1		
Sclerolaena muricata var. *semiglabra*	0.1	5	SG			0.1							
*Lactuca serriola**	0.1	5	EX								0.1		
Euphorbia drummondii	0.1	5	FG					0.1					

Easting	444275
Northing	6100781
Orientation	275°
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	72

Grassy_03PECe			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
PCT 80			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 25/03/25			29	21	1	1	9	9	1	0	8	0	
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum	
			33.7	32	2	1	27.5	1.4	0.1	0	1.7	0	
Eucalyptus melliodora	2	5	TG		2								
Austrostipa scabra subsp. *scabra*	15	300	GG				15						
Rytidosperma caespitosum	5	200	GG				5						
Vittadinia sp.	0.1	10	FG					0.1					
Panicum effusum	0.2	10	GG				0.2						
*Conyza sp.**	0.1	10	EX								0.1		
Austrostipa bigeniculata	4	50	GG				4						
Oxalis perennans	0.2	50	FG					0.2					
Lomandra confertifolia	1	100	GG				1						
Goodenia sp.	0.1	5	FG					0.1					
*Romulea minutiflora**	0.1	5	EX								0.1		
*Lactuca serriola**	0.1	3	EX								0.1		
Einadia nutans subsp. *nutans*	0.2	20	FG					0.2					
Calotis lappulacea	0.3	20	FG					0.3					
*Cirsium vulgare**	1	20	EX								1		
*Hypochaeris radicata**	0.1	10	EX								0.1		
Wahlenbergia sp.	0.1	3	FG					0.1					
Eragrostis brownii	0.1	5	GG				0.1						
Maireana enchylaenoides	0.1	10	FG					0.1					
Erodium crinitum	0.1	10	FG					0.1					
*Heliotropium europaeum**	0.1	5	EX								0.1		
Elymus scaber	1	30	GG				1						
Lomandra multiflora	1	50	GG				1						
Enteropogon acicularis	0.2	20	GG				0.2						
Chenopodium desertorum subsp. *microphyllum*	1	30	SG			1							
*Convolvulus arvensis**	0.1	10	EX								0.1		
Maireana enchylaenoides	0.2	30	FG					0.2					
Cheilanthes sieberi	0.1	10	EG						0.1				
*Chondrilla juncea**	0.1	5	EX								0.1		

Easting	468354
Northing	6099403
Orientation	229°
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	0
10-19	0
5-9	Yes
<5	Yes
Hollows	0
Length logs (m)	4
BAM Attributes 1x1 plot (%)	
Litter (%)	47

Grassy_03Remnant			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
PCT 80			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 25/03/25			19	19	4	2	5	7	1	0	0	0	
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum	
			68.8	**68.8**	64.1	0.4	3.5	0.7	0.1	0	**0**	0	
Eucalyptus melliodora	20	4	TG		20								
Callitris glaucophylla	40	120	TG		40								
Chenopodium desertorum	0.2	5	SG			0.2							
Austrostipa scabra	3	50	GG				3						
Eucalyptus microcarpa	4	1	TG		4								
Lomandra confertifolia	0.2	20	GG				0.2						
Sida corrugata	0.1	10	FG					0.1					
Allocasuarina luehmannii	0.1	5	TG		0.1								
Cheilanthes sieberi	0.1	10	EG						0.1				
Enteropogon acicularis	0.1	10	GG				0.1						
Maireana enchylaenoides	0.1	5	FG					0.1					
Panicum effusum	0.1	5	GG				0.1						
Rytidosperma caespitosum	0.1	10	GG				0.1						
Chenopodium sp.	0.1	5	FG					0.1					
Vittadinia cuneata var. *hirsuta*	0.1	5	FG					0.1					
Alternanthera denticulata	0.1	5	FG					0.1					
Dodonaea viscosa	0.2	3	SG			0.2							
Einadia nutans	0.1	5	FG					0.1					
Dianella revoluta	0.1	5	FG					0.1					

Easting	468336
Northing	6099433
Orientation	230° *assumed
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	3
20-29	Yes
10-19	Yes
5-9	Yes
<5	Yes
Hollows	1
Length logs (m)	26
BAM Attributes 1x1 plot (%)	
Litter (%)	66

Forested Wetlands

RedGum_01Remnant			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54	Easting	660316
Offeasement (in Vic) - Remnant			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count		Northing	6172194
**assumed to be PCT 8															
Date: 21/03/25			11	11	1	0	3	7	0	0	0	0		Orientation	120°
Species	Cover	Abundance	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum		Plot size	20 X 20 X 50
			26.3	26.3	15	0	0.7	10.6	0	0	0	0		BAM Attributes 20x50m plot	
Eucalyptus camaldulensis	15	15	TG		15									Stem classes	
Calotis cuneifolia	10	500	FG					10						80+	1
Centipeda minima	0.1	10	FG					0.1						50-79	6
Stemodia florulenta	0.1	10	FG					0.1						30-49	7
Euphorbia dallachyana	0.1	40	FG					0.1						20-29	Yes
Teucrium racemosum	0.1	20	FG					0.1						10-19	No
Picris squarrosa	0.1	5	FG					0.1						5-9	No
Cyperus gymnocaulos	0.4	30	GG				0.4							<5	Yes
Carex bichenoviana	0.2	20	GG				0.2							Hollows	5
Cynodon dactylon	0.1	5	GG				0.1							Length logs (m)	49
Eclipta platyglossa	0.1	20	FG					0.1							
														BAM Attributes 1x1 plot (%)	
														Litter (%)	74

RedGum_01PL			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54	Easting	660299
Offeasement (in Vic) - Historic easement			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count		Northing	6172163
**assumed to be PCT 8															
Date: 21/03/25			15	15	2	2	2	9	0	0	0	0		Orientation	105°
Species	Cover	Abundance	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum		Plot size	20 X 20 X 50
			34.8	34.8	2.4	0.7	0.3	31.4	0	0	0	0		BAM Attributes 20x50m plot	
Eucalyptus camaldulensis	2	3	TG		2									Stem classes	
Acacia stenophylla	0.4	1	TG		0.4									80+	0
Duma florulenta	0.5	3	SG			0.5								50-79	0
Calotis cuneifolia	30	1000	FG					30						30-49	0
Stemodia florulenta	0.6	30	FG					0.6						20-29	No
Chenopodium nitrariaceum	0.2	10	SG			0.2								10-19	Yes
Euphorbia dallachyana	0.1	20	FG					0.1						5-9	Yes
Cyperus gymnocaulos	0.1	40	GG				0.1							<5	Yes
Rumex brownii	0.1	5	FG					0.1						Hollows	0
Carex bichenoviana	0.2	20	GG				0.2							Length logs (m)	46
Centipeda minima	0.1	10	FG					0.1							
Eclipta platyglossa	0.2	20	FG					0.2						BAM Attributes 1x1 plot (%)	
Solanum esuriale	0.1	5	FG					0.1						Litter (%)	34
Cullen tenax	0.1	5	FG					0.1							
Geranium sp.	0.1	5	FG					0.1							

RedGum_02PL			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54	Easting	722970
PCT 8			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count		Northing	6158184
Date: 21/03/25			13	10	1	2	3	3	1	0	3	2		Orientation	130°
Species	Cover	Abundance	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum		Plot size	20 X 20 X 50
			1.5	1	0.1	0.2	0.3	0.3	0.1	0	0.5	0.4		BAM Attributes 20x50m plot	
Eucalyptus camaldulensis	0.1	1	TG		0.1									Stem classes	
*Xanthium spinosum**	0.1	1	HT									0.1		80+	0
Cynodon dactylon	0.1	20	GG				0.1							50-79	0
*Phyla canescens**	0.3	60	HT									0.3		30-49	0
Eleocharis sp. (no fertile material)	0.1	20	GG				0.1							20-29	No
Teucrium racemosum	0.1	20	FG					0.1						10-19	No
*Cirsium vulgare**	0.1	1	EX								0.1			5-9	Yes
Sclerolaena muricata var. *semiglabra*	0.1	2	SG			0.1								<5	Yes
Duma florulenta	0.1	1	SG			0.1								Hollows	0
Paspalidium jubiflorum	0.1	1	GG				0.1							Length logs (m)	32
Marsilea drummondii	0.1	1	EG						0.1						
Alternanthera denticulata	0.1	5	FG					0.1						BAM Attributes 1x1 plot (%)	
Euphorbia dallachyana	0.1	10	FG					0.1						Litter (%)	21.2

RedGum_02PECe			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54	Easting	722998
PCT 8			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count		Northing	6158210
Date: 21/03/25			16	13	2	3	5	3	0	0	2	2		Orientation	140°
Species	Cover	Abundance	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum		Plot size	20 X 20 X 50
			3.1	2.3	1.1	0.3	0.6	0.3	0	0	0.3	0.3		BAM Attributes 20x50m plot	
Eucalyptus camaldulensis	0.1	6	TG		0.1									Stem classes	
Acacia stenophylla	1	3	TG		1									80+	0
Sclerolaena muricata var. *semiglabra*	0.1	10	SG			0.1								50-79	0
*Phyla canescens**	0.2	50	HT									0.2		30-49	0
Euphorbia dallachyana	0.1	10	FG					0.1						20-29	1
Cynodon dactylon	0.1	10	GG				0.1							10-19	Yes
Paspalidium jubiflorum	0.2	50	GG				0.2							5-9	No
*Xanthium spinosum**	0.1	1	HT									0.1		<5	Yes
Eleocharis sp. (no fertile material)	0.1	10	GG				0.1							Hollows	0
Teucrium racemosum	0.1	5	FG					0.1						Length logs (m)	102
Juncus sp. (no fertile material)	0.1	20	GG				0.1								
Goodenia sp.	0.1	5	FG					0.1						BAM Attributes 1x1 plot (%)	
Eremophila divaricata	0.1	2	SG			0.1								Litter (%)	44
Duma florulenta	0.1	1	SG			0.1									
Eragrostis australasica	0.1	1	GG				0.1								
Acacia stenophylla (subject to clearing post VI plot collection - can be seen in photo)	0.5	1													

RedGum_02Remnant			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54	Easting	723041
PCT 8			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count		Northing	6158279
Date: 21/03/25			10	8	1	1	5	0	1	0	2	1		Orientation	125°
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum		**Plot size**	20 X 20 X 50
			11.8	**11.6**	10	0.1	1.4	0	0.1	0	**0.2**	0.1		BAM Attributes 20x50m plot	
Eucalyptus camaldulensis	10	40	TG		10									Stem classes	
Eragrostis australasica	1	40	GG				1							**80+**	0
Paspalidium jubiflorum	0.1	10	GG				0.1							**50-79**	0
Cynodon dactylon	0.1	20	GG				0.1							**30-49**	0
Sclerolaena muricata var. *semiglabra*	0.1	10	SG			0.1								**20-29**	No
Juncus flavidus	0.1	5	GG				0.1							**10-19**	Yes
*Phyla canescens**	0.1	10	HT									0.1		**5-9**	Yes
*Cirsium vulgare**	0.1	1	EX								0.1			**<5**	Yes
Eleocharis sp. (no fertile material)	0.1	20	GG				0.1							Hollows	0
Marsilea drummondii	0.1	20	EG						0.1					Length logs (m)	6
														BAM Attributes 1x1 plot (%)	
														Litter (%)	19.6

RedGum_03PECe			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54	Easting	723325
PCT 11			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count		Northing	6157948
Date: 21/06/25			8	6	0	2	2	2	0	0	1	1		Orientation	305°
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum		**Plot size**	20 X 20 X 50
			4.8	**0.7**	0	0.2	0.3	0.2	0	0	**0.1**	0.1		BAM Attributes 20x50m plot	
Cynodon dactylon	0.2	30	GG				0.2							Stem classes	
Eleocharis sp. (no fertile material)	0.1	30	GG				0.1							**80+**	0
Euphorbia dallachyana	0.1	30	FG					0.1						**50-79**	0
*Phyla canescens**	0.1	10	HT									0.1		**30-49**	0
Duma florulenta	0.1	1	SG			0.1								**20-29**	No
Wahlenbergia communis	0.1	1	FG					0.1						**10-19**	No
Sclerolaena muricata var. *semiglabra*	0.1	1	SG			0.1								**5-9**	No
														<5	No
														Hollows	0
														Length logs (m)	84
Eucalyptus camaldulensis (subject to clearing post VI plot collection - can be seen in photo)	4	10													
														BAM Attributes 1x1 plot (%)	
														Litter (%)	22

RedGum_03PL			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
PCT 11			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 21/03/25			10	8	0	2	3	3	0	0	1	1	
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum	
			7.2	4	0	3.2	0.5	0.3	0	0	0.2	0.2	
Duma florulenta	0.2	5	SG			0.2							
Euphorbia dallachyana	0.1	20	FG					0.1					
Cynodon dactylon	0.1	10	GG				0.1						
Sclerolaena muricata var. *semiglabra*	3	100	SG			3							
Wahlenbergia communis	0.1	2	FG					0.1					
Alternanthera denticulata	0.1	10	FG					0.1					
Paspalidium jubiflorum	0.1	10	GG				0.1						
*Phyla canescens**	0.2	20	HT									0.2	
Juncus flavidus	0.3	20	GG				0.3						
Eucalyptus camaldulensis (subject to clearing post VI plot collection - can be seen in photo)	3	10											

Easting	723304
Northing	6157926
Orientation	310°
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	81
BAM Attributes 1x1 plot (%)	
Litter (%)	13.4

RedGum_03Remnant			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	54
PCT 11			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 21/03/25			10	10	1	2	4	3	0	0	0	0	
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum	
			15.9	15.9	15	0.2	0.4	0.3	0	0	0	0	
Eucalyptus camaldulensis	15	30	TG		15								
Duma florulenta	0.1	2	SG			0.1							
Juncus flavidus	0.1	10	GG				0.1						
Centipeda minima	0.1	20	FG					0.1					
Euphorbia dallachyana	0.1	20	FG					0.1					
Eleocharis sp. (no fertile material)	0.1	30	GG				0.1						
Cynodon dactylon	0.1	10	GG				0.1						
Sclerolaena muricata var. *semiglabra*	0.1	5	SG			0.1							
Paspalidium jubiflorum	0.1	5	GG				0.1						
Solanum sp.	0.1	1	FG					0.1					

Easting	723383
Northing	6158009
Orientation	310°
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	7
20-29	Yes
10-19	Yes
5-9	Yes
<5	Yes
Hollows	0
Length logs (m)	69
BAM Attributes 1x1 plot (%)	
Litter (%)	36

Dry Sclerophyll Forests (Shrubby sub-formation)

Drysclero_01PECe			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
PCT 110			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 25/03/2025			26	18	1	1	9	7	0	0	8	2	
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum	
			9.1	7.1	0.5	0.1	4.4	2.1	0	0	2	1.1	
Eucalyptus sp. (regrowth)	0.5	2	TG		0.5								
Juncus flavidus	1	30	GG				1						
Eragrostis leptostachya	1	30	GG				1						
Dysphania pumilio	1	60	FG					1					
Rytidosperma caespitosum	0.3	30	GG				0.3						
Rumex brownii	0.3	20	FG					0.3					
Dichelachne crinita	1	30	GG				1						
Setaria sp.	0.1	10	GG				0.1						
Aristida ramosa	0.5	20	GG				0.5						
*Acetosa sagittata**	1	1000	HT									1	
Alternanthera nana	0.1	20	FG					0.1					
*Hypericum perforatum**	0.1	5	HT									0.1	
*Bromus hordeaceus**	0.2	10	EX								0.2		
Gonocarpus elatus	0.4	2	FG					0.4					
Cyperus sp.	0.1	10	GG				0.1						
Melichrus urceolatus	0.1	2	SG			0.1							
*Cirsium vulgare**	0.3	35	EX								0.3		
Oxalis perennans	0.1	10	FG					0.1					
Hydrocotyle laxiflora	0.1	5	FG					0.1					
*Medicago sp.**	0.1	20	EX								0.1		
*Hypochaeris radicata**	0.1	20	EX								0.1		
Austrostipa scabra	0.3	20	GG				0.3						
Panicum effusum	0.1	5	GG				0.1						
*Echium plantagineum**	0.1	2	EX								0.1		
*Erodium cicutarium**	0.1	5	EX								0.1		
Solanum sp.	0.1	1	FG					0.1					

Easting	528366
Northing	6102489
Orientation	280°
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	2
BAM Attributes 1x1 plot (%)	
Litter (%)	51

Drysclero_01Remnant			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat	55
PCT 110			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Date: 25/03/2025			18	16	2	2	7	4	1	0	2	1	
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum	
			59.2	**58.9**	10.1	0.6	47.3	0.5	0.4	0	**0.3**	0.2	
Eucalyptus macrorhyncha	0.1	5	TG		0.1								
Eucalyptus microcarpa	10	2	TG		10								
Juncus usitatus	1	30	GG				1						
Aristida ramosa	40	100	GG				40						
Cheilanthes sieberi	0.4	30	EG						0.4				
Eragrostis brownii	0.3	10	GG				0.3						
Melichrus urceolatus	0.5	5	SG			0.5							
Austrostipa scabra	5	40	GG				5						
Aristida sp.	0.5	20	GG				0.5						
Gonocarpus teucrioides	0.2	20	FG					0.2					
Euphorbia drummondii	0.1	5	FG					0.1					
*Hypochaeris radicata**	0.1	5	EX								0.1		
Eragrostis elongata	0.3	30	GG				0.3						
Oxalis perennans	0.1	5	FG					0.1					
Einadia hastata	0.1	5	FG					0.1					
*Acetosa sagittata**	0.2	15	HT									0.2	
Acacia genistifolia	0.1	1	SG			0.1							
Dichelachne crinita	0.2	10	GG				0.2						

Easting	528362
Northing	6102447
Orientation	230°
Plot size	20 X 20 X 50
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	1
20-29	Yes
10-19	Yes
5-9	No
<5	No
Hollows	2
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	22

Appendix O

Cumulative impact assessment

O1 Determination of excluded impacts

O1.1 Approach to cumulative impact assessment

The cumulative impact assessment considers other nearby developments along with the project and assesses the scale and nature of the cumulative impacts on key ecological issues. The size of the cumulative impact study area was identified based on the scale and nature of the potential impacts of the project, which may be combined with other relevant future projects. This conservatively included an area of around 35 kilometres from the project footprint

The assessment is consistent with the requirements of the *Cumulative Impact Assessment Guidelines for state significant Projects (DPHI 2026).* These guidelines define cumulative impacts as those arising as a result of incremental, sustained and combined effects of human action and natural variations over time that can be both positive and negative. These impacts can be caused by the compounding effects of a single project or multiple projects in an area, and by the accumulation of effects from past, current and future activities as they arise.

Further detail on cumulative impact assessment approach and the other projects considered in the cumulative impact assessment is provided in Chapter 6 (Cumulative impacts) of the Amendment Report EIS.

The cumulative biodiversity impact assessment involved:

- review of the nature and scale of potential biodiversity impacts, as described in publicly available planning and biodiversity documents for relevant future projects
- combined quantitative assessment of potential regional cumulative impacts to native vegetation, threatened species and Threatened Ecological Communities (TECs) of relevant future projects, in combination with the project
- qualitative assessment of potential regional cumulative impacts on Groundwater Dependent Ecosystems (GDEs), wildlife connectivity and habitat corridors, and protected and sensitive lands with a review of regional habitat impacts for areas directly impacted by the project and relevant future projects
- recommendation of mitigation measures, as required.

O1.2 Projects considered

The relevant future projects that were considered as having the potential to result in cumulative biodiversity impacts with the project are listed in Table O.1. The location of the major relevant future projects is provided in Figure O.1.

Table O.1 Projects considered for cumulative assessment

Related developments		
1. VNI West (Victoria)	2. EnergyConnect (NSW – Eastern section) (SSI-9172452)	3. HumeLink (SSI-36656827)
Projects currently subject to environmental assessment		
4. Junction Rivers Wind Farm (SSD-30448824)	12. Pottinger Solar Farm (SSD-59254709)	21. Belhaven Battery Energy Storage System (SSD-57575973)
5. Keri Keri Wind Farm (SSD-38358962)	14. Bullawah Wind Farm (SSD-50505215)	22. Livingstone Solar Farm (SSD-80114208)
6. Wilan Wind Farm (SSD-51306206)	15. Romani Battery Energy Storage System (SSD-67105475)	23. Mangoplah Battery Energy Storage System (SSD-77527735)
7. Baldon Wind Farm (SSD-40138508)	16. West Nyangay Solar Farm (SSD-74990235)	27. Riverina Redevelopment Program
8. Tchelery Wind Farm (SSD-59701722)	17. Conargo Wind Farm (SSD-70611708)	28. Gregadoo Waste Management Centre Renewal
9. Abercrombie Wind Farm (SSD-77340978)	19. Dinawan Wind Farm (SSD-50725708)	29. Riverina Storage Pipeline (SSI-88716456)
10. Wanganella Wind Farm (SSD-78102208)	20. Argoon Wind Farm (SSD-64935522)	30. Booroorban (Saltbush) Wind Farm (SSD-70636459)
Approved or changed projects		
11. Pottinger Wind Farm (SSD-59235464)	18. Dinawan Solar Farm (SSD-50725959)	25. Gregadoo Solar Farm (SSD-8825)
13. Billabong Creek Environmental Water Regulators (SSI-50831979)	24. Yanco Delta Wind Farm (SSD-41743746)	26. Inland Rail (Albury to Illabo) (SSI-10055)

O1.2.1 South West Renewable Energy Zone access right agreements

In April 2025, EnergyCo granted access rights to six wind, solar and large-scale battery projects with a combined generation capacity of 3.56 gigawatts[1]. The projects are:

- Yanco Delta Wind Farm
- Dinawan Energy Hub – consisting of the Dinawan Solar Farm and Dinawan Wind Farm
- Pottinger Energy Park – consisting of the Pottinger Solar Farm and Pottinger Wind Farm
- Bullawah Wind Farm.

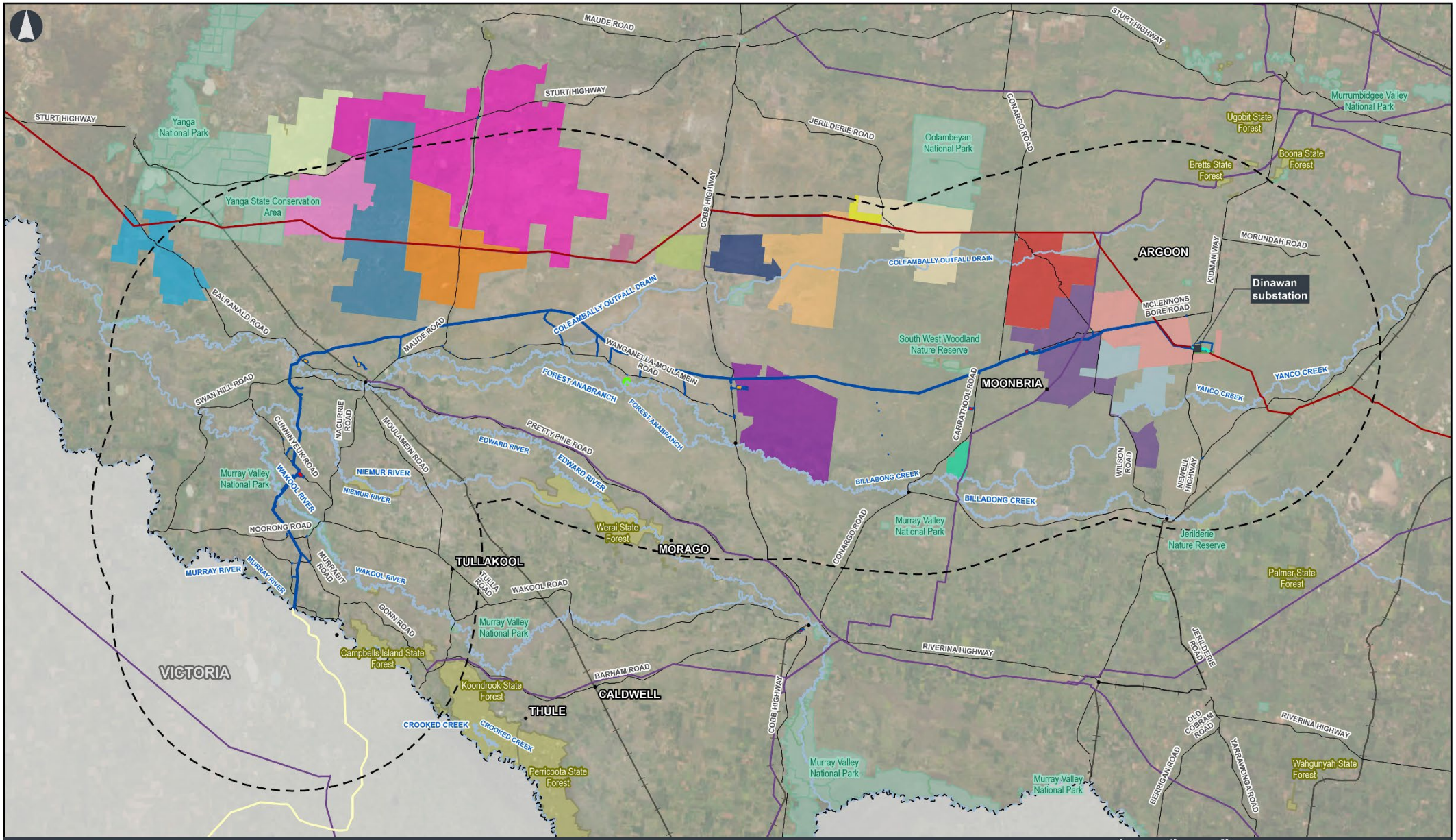
The combined generation capacity of these proposed or approved projects represents the initial allocation of access rights under the South West Renewable Energy Zone access scheme. In making this decision, the maximum capacity for access rights assigned to each proposed renewable energy project is lower than what has been identified in planning assessment documentation for those projects, and it would alter the likelihood of some of the remaining projects in the South West Renewable Energy Zone proceeding in the short-term. However, for the purposes of this cumulative assessment it is assumed that all identified projects would proceed as described in the relevant planning assessment documentation available at the time of the assessment (in line with the *Cumulative Impact Assessment Guidelines for State Significant Projects* (NSW DPIE, 2022)).

O1.3 Limitations and assumptions

The following limitations and assumptions are considered relevant to the assessment:

- This cumulative impact assessment is limited by the availability of biodiversity assessments for future relevant projects and assumes the other assessments have provided accurate and reliable information.
- Many of the future relevant projects are in the planning phase, or with respective EIS still in preparation, and therefore the level of direct impacts to native vegetation, threatened ecological communities, and threatened and migratory species is currently being determined.
- It is unlikely that all projects currently being assessed would be approved. For the purpose of this assessment, it is assumed that all future relevant projects detailed would be approved, however it is considered likely that the eventual actual cumulative impacts would be lower.

[1] Media Release – South West Renewable Energy Zone powers up



WSP

VNI West (NSW)

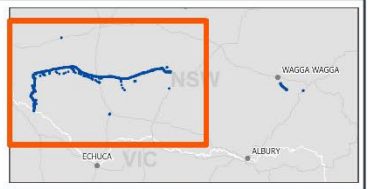
Figure O.1a
Cumulative impact projects

Legend

- Rail line
- Main road
- Named waterway
- Approved Project EnergyConnect
- Existing transmission line
- Dinawan substation works - existing 330 kV
- Dinawan substation works - proposed 500 kV
- NSW/Victorian border
- Cumulative Study area
- Amended project footprint
- VNI West (Victoria)
- Combined temporary worker accommodation facility and construction compound
- Construction compound
- National park
- State forest

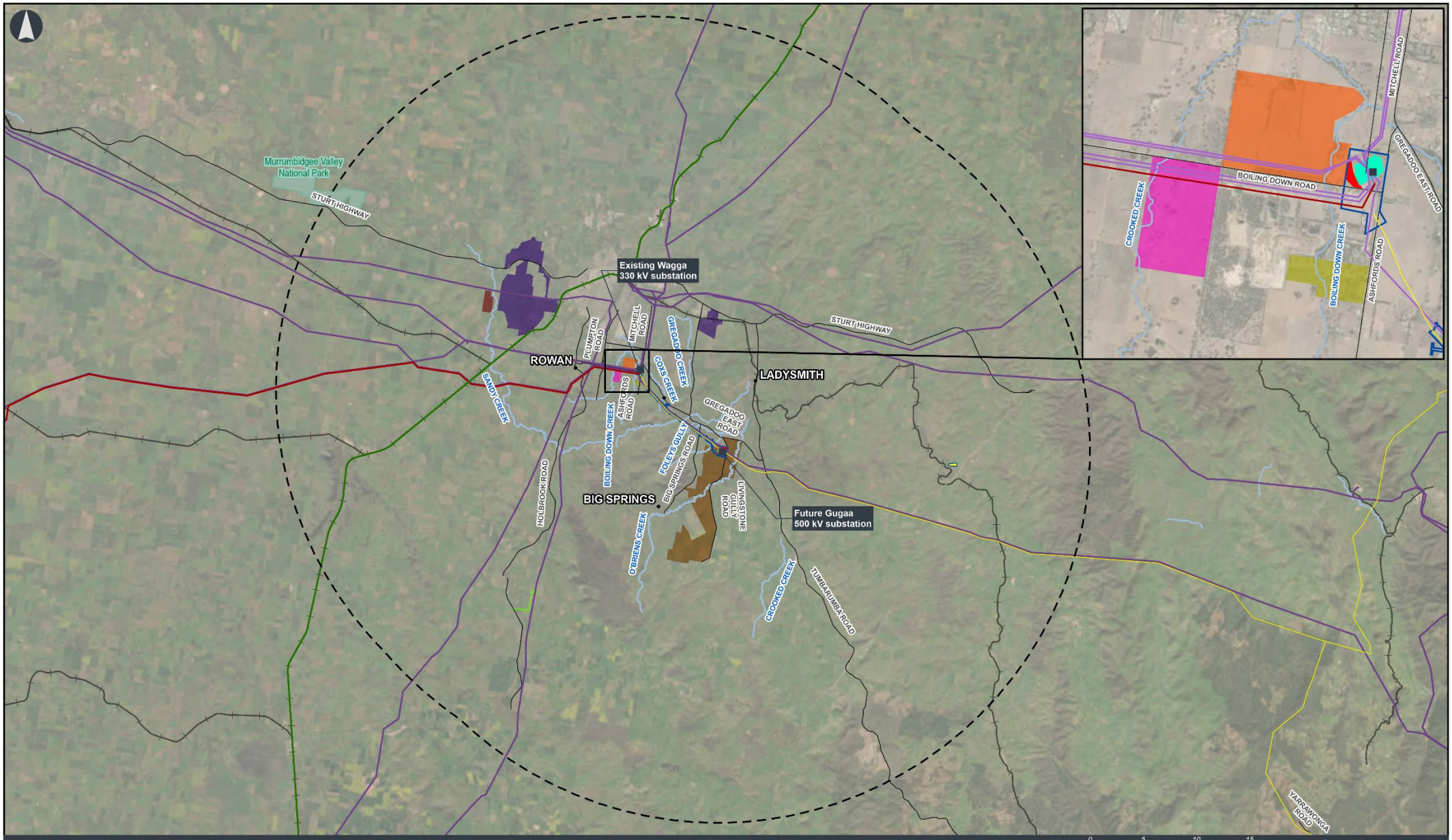
Relevant future projects

- Abercrombie Wind Farm
- Argoon Wind Farm
- Baldon Wind Farm
- Billabong Creek Environmental Water Regulators - Caroonboon
- Dinawan Solar Farm
- Dinawan Wind Farm (East)
- Dinawan Wind Farm (West)
- Pottinger Wind Farm
- Tchelery Wind Farm
- Yanco Delta Wind Farm
- Wilan Wind Farm
- Bullawah Wind Farm
- Junction Rivers Wind Farm
- Keri Keri Wind Farm
- Pottinger Solar Farm
- Romani Solar Farm
- West Nyangay Solar Farm
- Conargo Wind Farm
- Wanganella Wind Farm
- Saltbush Wind Farm



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Data sources: NSW EPI, DELWP, WSP, EnergyConnect



VNI West (NSW)

Figure O.1b
Cumulative impact projects

Legend

- Rail line
- Main road
- Named waterway
- Approved Project EnergyConnect
- Existing transmission line
- Albury to Illabo
- HumeLink project transmission line (under construction)
- Cumulative Study area
- Amended project footprint
- Substation
- National park
- Temporary worker accommodation facility
- Construction compound

Relevant future projects

- Gregadoo Waste Management Centre
- Riverina Redevelopment Program
- Riverina Storage Pipeline Project
- Livingstone Solar Farm
- Belhaven Battery Energy Storage System
- Gregadoo Solar Farm
- Mangoplah Battery Energy Storage System



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Data sources: NSW EPI, DELWP, WSP, EnergyConnect

O2 Impact assessment

Table O.2 summarises the biodiversity impacts for this project and the surrounding projects where quantitative data is available. The surrounding projects proximity to the VNI-W (NSW) projects are shown in Figure O.1.

Table O.2 Relevant future projects considered in the cumulative biodiversity impact assessment

Project	SSD/SSI	Proponent	Scope	Location/distance to project	Project timeline
VNI West (Victoria)	n/a	VicGrid VNI West (formerly Transmission Company Victoria, TCV)	Victorian component of the VNI West project. VNI West (Victoria) would consist of around 240 km of new 500 kV transmission line between the connection point with VNI West (NSW) and Bulgana, Victoria.	VNI West (Victoria) provides a direct connection into the project at NSW/Victoria border.	— the (former) TCV released its 70 m preferred easement alignment for the Victorian component in October 2024 — the project is currently undergoing environmental assessment in accordance with Victorian and Commonwealth planning processes, and is subject to ongoing preparation of an Environment Effects Statement (EES) — initial completion was estimated to occur in 2026. However, on 30 June 2025, the-then TCV announced a two-year delay to VNI West in Victoria, citing additional time required to complete property and environmental processes in developing the EES. This would result in VNI West in Victoria being constructed by November 2030[2].

[2] Due to the timing of the announcement, assessment of the cumulative impacts associated with the VNI West (Victoria) project are based on the original completion date of 2026.

Project	SSD/SSI	Proponent	Scope	Location/distance to project	Project timeline
EnergyConnect (NSW Eastern Section) (Approved)	SSI-9172452	Transgrid	Development of a new transmission line connecting the existing Buronga substation and Wagga 330 kV substation via the future Dinawan substation (around 170 km west of Wagga Wagga).	EnergyConnect (NSW – Eastern section) provides a direct connection into the project at the future Dinawan substation (being constructed as part of EnergyConnect (NSW – Eastern section)) and there would be the potential to reuse the combined temporary worker accommodation facilities and construction compound at future Dinawan substation.	— project approved in September 2022 — construction began in early 2023 and is expected to continue until around mid to-late 2026 — operation is expected to begin in 2026 with an operational life of around 50 years.
Humelink (Approved)	SSI-36656827	Transgrid	Construction and operation of new transmission lines between the existing substations at Wagga and Bannaby, the future Maragle substation, and at the future Gugaa 500 kV substation, Livingstone Gully Road.	The project overlaps the HumeLink project footprint at Gregadoo and connects to the future Gugaa 500 kV substation, Livingstone Gully Road being constructed as part of HumeLink.	— project approved in November 2024 — main construction has commenced and is expected to take around 2.5 years to complete — operation is expected to begin in mid-2027 with an operational life of 50 to 70 years.
Junction River Wind Farm (formerly Burrawong Wind Farm)	SSD-30448824	Junction Rivers Pty Ltd	Development of a proposed 750 MW wind farm comprising around 96 turbines (maximum tip height of up to 300 m), battery energy storage system (BESS) and associated infrastructure across an area of around 16,367 ha.	Junction Rivers Wind Farm is located around 20 km north-west of the project.	— EIS exhibited July/August 2024; a response to submissions has been completed, and the project is under assessment from DPHI — it is anticipated that works associated with the wind farm could commence within six months of project approval — pre-construction and construction expected to take up to 54 to 60 months.

Project	SSD/SSI	Proponent	Scope	Location/distance to project	Project timeline
Keri Keri Wind Farm	SSD-38358962	Acciona Energy Australia Global Pty Ltd	Development of a wind farm comprising around 114 wind turbines (maximum tip height of up to around 291 m), BESS and associated infrastructure across an area of around 18,006 ha.	Keri Keri Wind Farm is located around 22 km north of the project.	— EIS exhibited between May and June 2024; a response to submissions and the amendment report has been completed, and the project is under assessment from DPHI — construction is proposed to begin in late 2027 and is expected to take about 18 months — operation is expected to begin in 2029 with an operational life of around 30 years.
Wilan Wind Farm (Prepare EIS)	SSD-51306206	Kilara Utilities Pty Ltd	Development of a proposed 800 MW wind farm comprising around 138 wind turbines (maximum tip height of up to 300 m), BESS and associated infrastructure across an area of around 16,000 ha.	Wilan Wind Farm is located around 34 km north of the project.	— SEARs issued in December 2022 (with supplementary SEARs issued in April 2023); an EIS is being prepared — construction is proposed to begin in 2025 and is expected to take around 24 to 30 months — operation is expected to begin in late 2026 or 2027 with an operational life of 25 to 30 years.

Project	SSD/SSI	Proponent	Scope	Location/distance to project	Project timeline
Baldon Wind Farm	SSD-40138508	Goldwind Australia	Development of a proposed 1,400 MW wind farm comprising around 175 wind turbines (maximum tip height of up to 300 m), BESS and associated infrastructure across an area of around 42,500 ha.	Baldon Wind Farm is located around 2 km north of the project.	— EIS exhibited between August and September 2024; a response to submissions has been completed, and the project is under assessment from DPHI — construction was expected to begin in early 2026 and take around 36 months (if constructed in one stage) — pending approval, operation is expected to begin in 2029 with an operational life of 35 years.
Tchelery Wind Farm	SSD-59701722	Neoen	Development of a proposed 800 MW wind farm comprising around 120 wind turbines (with a maximum tip height of 285 m) and associated infrastructure across an area of around 27,400 ha.	Tchelery Wind Farm is located around 2.2 km north of the project.	— SEARs issued in July 2023 (with supplementary SEARs issued December 2023); an EIS has been exhibited from 4 July to 4 August 2025, and a submissions report is being prepared — construction was proposed to commence in early 2026 and was expected to take around 30 months — operation is expected to begin in 2028 with an operational life of around 30 years.

Project	SSD/SSI	Proponent	Scope	Location/distance to project	Project timeline
Abercrombie Wind Farm (Prepare EIS)	SSD-77340978	Abercrombie Wind Farm Pty Ltd	Development of a proposed 2.5 GW wind farm comprising around 348 wind turbines (maximum tip height of up to 300 m), BESS and associated infrastructure across an area of around 91,365 ha.	Abercrombie Wind Farm is located around 12 km north of the project.	— SEARs issued in December 2024; an EIS is being prepared — construction is proposed to commence in early 2028 and is expected to take around five years — operation is expected to begin in 2033 with an operational life of around 35 years.
Wanganella Wind Farm (Prepare EIS)	SSD-78102208	Equis Wind Australia Pty Ltd	Development of a proposed 840 MW wind farm comprising around 105 wind turbines (with a maximum tip height of 270 m), BESS and associated infrastructure across an area of around 30,737 ha.	The project traverses through the Wanganella Wind Farm.	— SEARs issued in November 2024; an EIS is being prepared — construction is proposed to commence in 2027 and is expected to take around two years — operation is expected to begin in 2030 with an operational life of around 30 years.
Pottinger Wind Farm	SSD-59235464	Someva Renewables	Development of a proposed 1,300 MW wind farm comprising around 247 wind turbines (with a maximum tip height of 280 m), BESS and associated infrastructure across an area of around 26,000 ha.	Pottinger Wind Farm is located around 10 km north of the project.	— secured access rights under the South West REZ access rights agreement in April 2025 — project approved in July 2025 — construction is expected to begin in late 2026 and is expected to take around 55 months — operation is expected to begin in 2029 with an operational life of around 35 years.

Project	SSD/SSI	Proponent	Scope	Location/distance to project	Project timeline
Pottinger Solar Farm (Prepare EIS)	SSD-59254709	Someva Renewables	Development of a proposed 300 MW solar farm comprising photovoltaic (PV) panels, BESS and associated infrastructure across an area of around 1,460 ha.	Pottinger Solar Farm is located around 20 km north of the project.	— secured access rights under the South West REZ access rights agreement in April 2025 — SEARs issued July 2023 and updated in May 2025; an EIS is currently being prepared — construction is proposed to commence in 2026 and is expected take around 24 months — operation is expected to begin in 2027 with an operational life of 50 years.
Billabong Creek Environmental Water Regulators	SSI-50831979	NSW Department of Climate Change, Energy, the Environment and Water	Replacing two existing weirs along Billabong Creek with two new environmental water regulators. The new regulators would allow for flow regulation and fish passage.	Billabong Creek Environmental Water Regulators project is located around 7 km south of the project.	— Project approved on February 2026 — construction is anticipated to start in 2025, and be completed by 2026 — the construction period is anticipated to be around 18 months

Project	SSD/SSI	Proponent	Scope	Location/distance to project	Project timeline
Bullawah Wind Farm	SSD-50505215	BayWa r.e Projects Australia	Development of a proposed 804 MW wind farm comprising around 141 wind turbines (with a maximum tip height of 300 m), BESS and associated infrastructure across an area of around 33,000 ha.	Bullawah Wind Farm is located around 19 km north-northwest of the project.	— secured access rights under the South West REZ access rights agreement in April 2025 — EIS exhibited between August and September 2024; a response to submissions and the amendment report has been completed, and the project is under assessment from DPHI — construction is proposed to begin in late 2025 and is expected to take around 35 months — operation is expected to begin in 2029 with an operational life of 30 years.
Romani Battery Energy Storage System (Submissions Report)	SSD-67105475	Samsung C&T Renewable Energy Australia Pty Ltd	Development of a proposed 200 MW / 800 MWh BESS and associated infrastructure across an area of around 21 ha.	Romani BESS is located around 12 km north of the project.	— SEARs issued March 2024 and amended on June 2025 to remove solar farm component; EIS exhibition ended on November 2025, and a submissions report is currently being prepared — construction is anticipated to start in 2025, and be completed by 2026 — the construction period is anticipated to be around 20 months.

Project	SSD/SSI	Proponent	Scope	Location/distance to project	Project timeline
West Nyangay Solar Farm (Prepare EIS)	SSD-74990235	Australian Solar Farms	Development of a proposed 800 MW solar farm comprising of PV panels, BESS and associated infrastructure across an area of around 5,500 ha.	West Nyangay Solar Farm is located around 19 km north of the project.	— SEARs issued in September 2024; an EIS is currently being prepared — the project would be constructed over a period of around 12 to 18 months — construction commencement timeframe currently unknown.
Conargo Wind Farm (Prepare EIS)	SSD-70611708	Squadron Energy	Development of a proposed 300 MW wind farm comprising around 53 wind turbines (with a maximum tip height up to 270 m), BESS and associated infrastructure across an around of around 2,295 ha.	Conargo Wind Farm is located around 12.5 km south of the project.	— SEARs issued in May 2024 (with amended SEARs issued in December 2024); an EIS is currently being prepared — the project would be constructed over a period of around 24 months from 2027 — planned to operate in 2028/2029 with an estimated operational life of 30 years.

Project	SSD/SSI	Proponent	Scope	Location/distance to project	Project timeline
Dinawan Solar Farm	SSD-50725959	Spark renewables	Development of a proposed 800 MW solar farm comprising around PV panels, BESS and associated infrastructure across an area of around 3,257 ha	Dinawan Solar Farm is located around 100 m south of the project and involves connection work to the Dinawan 330 kV substation.	— secured access rights under the South West REZ access rights agreement in April 2025 — EIS exhibited between November and December 2023 — this project was granted development consent by the IPC on 2 April 2026.construction is proposed to begin in 2026 and is expected to take around 18 to 36 months — operation is expected to commence in 2027/8 with an operational life of 25 to 35 years.
Dinawan Wind Farm	SSD-50725708	Spark renewables	Development of a proposed 1,200 MW wind farm comprising around 200 wind turbines (with a maximum tip height of up to 250 m) and associated infrastructure across an area of around 46,000 ha	Dinawan Wind Farm (west) around 4 km north of the project. The project traverses Dinawan Wind Farm (east) and involves connection work to the Dinawan 330 kV substation.	— secured access rights under the South West REZ access rights agreement in April 2025 — EIS exhibited between July and August 2024; a response to submissions and the amendment report has been completed, and the project is under assessment from DPHI — construction is proposed to begin in 2025 and is expected to take around 60 months — operation is expected to begin in 2027/2028 with an operational life of 25 to 35 years.

Project	SSD/SSI	Proponent	Scope	Location/distance to project	Project timeline
Argoon Wind Farm (Prepare EIS)	SSD-64935522	Argoon Wind Farms	Development of a proposed 901 MW wind farm comprising around 106 wind turbines (with a maximum tip height of up to 249 m), BESS and associated infrastructure across an area of around 10,900 ha.	Argoon Wind Farms is located around 1 km south of the project.	— SEARs issued in December 2023 and updated in May 2025; an EIS is currently being prepared — the project would be constructed over a period of around 24 to 36 months — construction and operation commencement timeframe currently unknown.
Belhaven Battery Energy Storage System (Prepare EIS)	SSD-57575973	Vena Energy	Development of a proposed 400 MW / 3,985 MWh BESS including transmission connection and associated infrastructure.	Belhaven BESS project is located around 2 km west of the project.	— SEARs issued in May 2023 and updated in April 2025; an EIS is currently being prepared — construction is proposed to begin in 2025 and is expected to take 12 months — operation is expected to begin in 2026 with an operational life of around 20 years.
Livingstone Solar Farm (Prepare EIS)	SSD-80114208	Brunsdon Pastoral Co	Development of a proposed 300 to 600 MW solar farm comprising PV panels. BESS and associated infrastructure across an area of around 2,700 ha.	The future Gugaa 500 kV substation, Livingstone Gully Road is adjacent to the Livingstone Solar Farm project area.	— SEARs issued in March 2025; an EIS is currently being prepared — the project would be constructed over a period of around 12 to 24 months — construction and operation commencement timeframe currently unknown — an operational life of around 30 to 40 years is expected.

Project	SSD/SSI	Proponent	Scope	Location/distance to project	Project timeline
Mangoplah Battery Energy Storage System (Response to Submissions)	SSD-77527735	Samsun C&T Renewable Energy Australia Pty Ltd	Development of a proposed 100 MW / 400 MWh BESS including transmission connection and associated infrastructure.	Mangoplah BESS project is located around 21 km south of the project.	— SEARs issued in November 2024; an EIS exhibition ended in December 2025, and a submission report is currently being prepared — the project would be constructed over a period of around 12 to 15 months within indicative commencement in 2027 — operational commencement is expected in 2028/2029 with an expected operational life of around 20 years.

Project	SSD/SSI	Proponent	Scope	Location/distance to project	Project timeline
Yanco Delta Wind Farm (approved)	SSD-41743746	Yanco Delta WF Project Pty Ltd	Development of a proposed 1,500 MW wind farm comprising around 208 wind turbines (with a maximum tip height of up to 270 m), BESS and associated infrastructure across an area of around 42,000 hectares.	The project traverses through the Yanco Delta Wind Farm project area and involves connection work to the Dinawan 330 kV substation.	— secured access rights under the South West REZ access rights agreement in April 2025 — approved in December 2023 — project modified in June 2024 to correct turbine locations and development layout — a second modification has been exhibited for additional changes to the construction and operation of the wind farm including an increased project disturbance footprint, and provision of a temporary worker accommodation and an increased peak workforce (increase of 595 workers) — construction is proposed to begin in 2027 and is expected to take around 48 months — operation is expected to begin in 2028/2029 with an operational life of around 30 years.

Project	SSD/SSI	Proponent	Scope	Location/distance to project	Project timeline
Gregadoo Solar Farm (approved)	SSD-8825	Gregadoo Solar Farm Pty Ltd	Development of a proposed 47 MW solar farm comprising PV panels and associated infrastructure across an area of around 150 ha. A current modification proposal includes incorporation of a BESS, an increase in development area and a new access road.	Gregadoo Solar Farm is located adjacent to the project at the existing Wagga 330 kV substation.	— approved in December 2018 — project modified in March 2021 and August 2023 to increase the operating capacity and number of PV panels — current modification proposal exhibited between November and December 2024. his modification has not been determined (as of May 2026) with further information requested by DPHI. — construction is proposed to begin sometime in 2026 and is expected to take around 12 to 18 months to complete construction — the project has an operational life span of 30 years.
Inland Rail (Albury to Illabo) (approved)	SSI-10055	ARTC	Enhancement works to structures and sections of track along 185 km of existing operational standard gauge rail from the Victorian/NSW border to Illabo in regional NSW.	Inland Rail (Albury to Illabo) is located around 11.5 km north west of the project and 14 km west of the project.	— original project approved in October 2024 — Modification to Kemp Street Bridge, Junee approved in August 2025 — construction commenced in early 2025 and is expected to take around 30 months to complete — operation is expected to begin in around mid-2027

Project	SSD/SSI	Proponent	Scope	Location/distance to project	Project timeline
Riverina Redevelopment Program		Department of Defence	Redevelopment of the Royal Australian Air Force (RAAF) Base in Wagga and the Blamey Barracks in Kapooka.	RAAF Base Wagga is located around 8 km northeast of the project (Wagga 330 kV substation) while Blamey Barracks, Kapooka is located around 11 km northwest of the project (Wagga 330 kV substation)	— construction for the Albury Wodonga Military Area and RAAF Base Wagga Redevelopment Projects commencing in mid-2025 — construction is expected to be completed by mid-2033.
Gregadoo Waste Management Centre Renewal		Wagga Wagga City Council	Construction of a new general waste cell, new mono waste cell, purpose built shed and storage and access road rehabilitation of the existing waste centre	Gregadoo Waste Management Centre Renewal is adjacent to the network augmentation works on the eastern side of Gregadoo Road	— construction works are currently underway with the current works expected to be completed in mid-2026.
Riverina Storage Pipeline	SSI-88716456	APA Group	Construction of a loop of 112 km gas storage pipeline to store 200–500 terajoule of energy.	The Riverina Storage Pipeline project is located around 15 km northwest of the project	— scoping report submitted and SEARS issued on 13 August 2025; EIS is currently being prepared — construction planned for mid-2026, with operation planned for mid-2027.
Booroorban (Saltbush) Wind Farm	SSD-70636459	Hay Plains WF Pty Ltd	Construction of a wind farm with 70 turbines and capacity of 400 MW with a maximum tip height of 280 m and a BESS of 600 MW / 1200 MWh	Booroorban (Saltbush) Wind Farm is around 20 km north of the project	— SEARS issued on 20 December 2024; EIS currently being prepared — construction proposed to start in 2028 and last 30 months.

O2.1 Cumulative impacts on native vegetation, threatened species and threatened ecological communities

This section provides an assessment of the relevant future projects with potential cumulative native vegetation and threatened species impacts (see Table O.3).

Where available, the total impact to native vegetation from each relevant future project is provided along with a list of the TECs and threatened species that would be impacted. The total ecosystem credit and species credit requirement for each relevant project is also provided to provide an overview of cumulative offset requirements. A broad approach has been taken due to the variance in impacts between relevant future projects and the total native vegetation impact is considered the simplest way to represent impact to threatened species.

The results from the review of information (based on data extracted from EISs of future relevant projects, where available) indicate the following:

1 The known or estimated cumulative native vegetation impacts equate to 10,531.99 hectares.

2 The cumulative ecosystem credit requirement equates to 241,421 credits.

3 The cumulative species credit requirement equates to 442, 860 credits.

These figures may be an under- or overestimate, however, as not all future relevant projects under consideration had published EISs with impact data.

Ecological entities subject to cumulative impacts from current and relevant future projects have been identified from a review of the relevant future projects. These are listed in Table O.1.

BC Act listed TECs:

- Myall woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions; Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions – impacted by six future relevant projects.
- *Acacia melvillei* Shrubland in the Riverina and Murray-Darling Depression bioregions; White Box Yellow Box Blakely's Red Gum grassy woodland and derived native grassland – impacted by three future relevant projects.
- *Allocasuarina luehmannii* Woodland in the Riverina and Murray-Darling Depression Bioregions; Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions – impacted by one future relevant project.
- Inland Grey Box Woodlands in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions.
- Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions.
- White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions.

EPBC Act listed TECs:

- Weeping Myall Woodlands – impacted by six future relevant projects.
- Natural Grassland of the Murray Valley Plains – impacted by five future relevant projects.
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland – impacted by four future relevant projects.
- Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia – impacted by two future relevant projects.
- Buloke Woodlands; Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains – impacted by one future relevant project.
- Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains.

Many of the projects summarised in this assessment are in the early stages of preparing an EIS. Each project must take further steps to avoid and minimise impacts on biodiversity so the potential impacts in this assessment are likely to be reduced and further mitigation measures will be implemented during detailed design and construction. Where impacts are unavoidable, offsets would be generated project by project.

Table O.3 Quantitative cumulative biodiversity assessment

Project[3]	Known or estimated native vegetation impacts (ha)	TECs impacted		Species credit species impacted	Native vegetation offsets (ecosystem credits) total	Threatened species offsets (species credits) total
		BC Act	EPBC Act			
EnergyConnect (NSW – Eastern Section) (Approved)	Total of 1,615.20 ha This includes IBRA subregions: 484.60 in South Olary Plain 17.17 in Lachlan 991.63 in Murrumbidgee 79.58 in Lower Slopes 42.22 in Inland Slopes	Six TECs: 10.81 hectares of *Acacia melvillei* shrubland (endangered) 2.93 hectares of *Allocasuarina luehmannii* woodland (endangered) 33.86 hectares of Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions (endangered) 101.83 hectares of Myall woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions (endangered)	Eight TECs: 2.93 hectares of Buloke Woodlands (endangered) 17.56 hectares of Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia (endangered) 380.93 hectares of Mallee Bird Community of the Murray Darling Depression Bioregion (endangered) 62.47 hectares of Natural Grasslands of the Murray Valley Plains (critically endangered) 5.98 hectares of Plains mallee box woodland (endangered)	— *Acacia acanthoclada* (Harrow Wattle) — *Austrostipa metatoris* (A spear-grass) — *Austrostipa wakoolica* (A spear-grass) — *Brachyscome papillosa* (Mossgiel Daisy) — *Caladenia arenaria* (Sand-hill Spider Daisy) — *Calotis moorei* (A burr-daisy) — *Convolvulus tedmoorei* (Bindweed) — *Cullen parvum* (Small Scurf-pea) — *Lasiopetalum behrii* (Pink Velvet Bush) — *Lepidium monoplocoides* (Winged Peppercress) — *Leptorhynchos orientalis* (Lanky Buttons) — *Leptorhynchos waitzia* (Button Immortelle) — *Maireana cheelii* (Chariot Wheels) — *Pilularia novae-hollandiae* (Austral Pillwort) — *Pimelea serpyllifolia* subsp. *serpyllifolia* (Thyme Rice-Flower) — *Pterostylis cobarensis* (Greenhood Orchid) — *Swainsona colutoides* (Bladder Senna) — *Swainsona murrayana* (Slender Darling Pea)	Total of 43,244 This includes IBRA subregions: 10,041 in South Olary Plain 348 in Lachlan 29,771 in Murrumbidgee 2,127 in Lower Slopes 957 in Inland Slopes	Total of 46,030 This includes IBRA subregions: 2,086 in South Olary Plain 6 in Lachlan 38,544 in Murrumbidgee 4,372 in Lower Slopes 1,022 in Inland Slopes

[3] Information for each of these projects have been sourced from the latest BDAR's available in the Major Projects Planning Portal (https://www.planningportal.nsw.gov.au/major-projects)

Project[3]	Known or estimated native vegetation impacts (ha)	TECs impacted		Species credit species impacted	Native vegetation offsets (ecosystem credits) total	Threatened species offsets (species credits) total
		BC Act	EPBC Act			
		22.25 hectares of Sandhill Pine Woodland in the Riverine, Murray – Darling Depression and NSW South Western Slopes bioregions (endangered) 60.48 hectares of White Box Yellow Box Blakely's Red Gum grassy woodland and derived native grassland (critically endangered).	2.63 hectares of Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains (critically endangered) 101.83 hectares of Weeping Myall Woodlands (endangered) 34.89 hectares of White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (critically endangered).	— *Swainsona pyrophlia* (Yellow Swainson-pea) — *Swainsona sericea* (Silky Swainson-pea) — *Burhinus grallarius* (Bush Stone-curlew) — *Hieraaetus morphnoides* (Little Eagle) — *Lophochroa leadbeateri* (Pink Cockatoo) — *Myotis macropus* (Southern Myotis) — *Ninox connivens* (Barking Owl) — *Pedionomus torquatus* (Plains Wanderer) — *Petaurus norfolcensis* (Squirrel Glider) — *Polytelis anthopeplus monarchoides* (Regent Parrot (eastern subspecies)) — *Polytelis swainsonii* (Superb Parrot)		

Project[3]	Known or estimated native vegetation impacts (ha)	TECs impacted		Species credit species impacted	Native vegetation offsets (ecosystem credits) total	Threatened species offsets (species credits) total
		BC Act	EPBC Act			
HumeLink (Approved)	Total of 866.16 ha This includes IBRA subregions: 49.20 in Bungonia 115.04 in Crookwell 129.07 in Murrumbateman 331.93 in Inland Slopes 39.49 in Bondo 201.43 in Snowy Mountains	Five TECs: 0.92 hectares of Montane Peatlands and Swamps (endangered) 1.92 hectares of Monaro Tableland Cool Temperate Grassy Woodland (critically endangered) 3.38 hectares of Coolac Tumut Serpentine Shrubby Woodland (endangered) 6.62 hectares of Tableland Basalt Forest (endangered) 457.18 hectares of White Box Yellow Box Blakely's Red Gum grassy woodland and derived native grassland (critically endangered)	Two TECs: 0.58 hectares of Alpine Sphagnum Bogs and Associated Fens (endangered) 117.15 hectares of White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (critically endangered)	— Ausfeld's Wattle (*Acacia ausfeldii*) — Bynoe's Wattle (*Acacia bynoeana*) — Flockton Wattle (*Acacia flocktoniae*) — Yass Daisy (*Ammobium craspedioides*) — Dense Cord-rush (*Baloskion longipes*) — *Bossiaea fragrans* — Few-seeded Bossiaea (*Bossiaea oligosperma*) — Small Pale Grass-lily (Caes*ia parviflora var. minor*) — Crimson Spider Orchid (*Caladenia concolor*) — Dwarf Kerrawang (*Commersonia prostrata*) — Small Scurf-pea (*Cullen parvum*) — Michelago Parrot-pea (*Dillwynia glaucula*) — Buttercup Doubletail (*Diuris aequalis*) — Pale Golden Moths (*Diuris ochroma*) — Pine Donkey Orchid (*Diuris tricolor*) — Black Gum (*Eucalyptus aggregata*) — Paddy's River Box (*Eucalyptus macarthurii*) — Robertson's Peppermint (*Eucalyptus robersonii* subsp. *hemisphaerica*) — Superb Midge Orchid (*Genoplesium superbum*) — Wee Jasper Grevillea (*Grevillea iaspicula*) — Tumut Grevillea (*Grevillea wilkinsonii*)	Total of 13,870 This includes IBRA subregions: 992 in Bungonia 1,513 in Crookwell 1,501 in Murrumbateman 4,700 in Inland Slopes 799 in Bondo 4,365 in Snowy Mountains	Total of 200,174 This includes IBRA subregions: 21,114 in Bungonia 59,529 in Crookwell 32,043 in Murrumbateman 35,737 in Inland Slopes 4,830 in Bondo 46,921 in Snowy Mountains

Project[3]	Known or estimated native vegetation impacts (ha)	TECs impacted		Species credit species impacted	Native vegetation offsets (ecosystem credits) total	Threatened species offsets (species credits) total
		BC Act	EPBC Act			
				— Cambage Kunzea (*Kunzea cambagei*) — Aromatic Peppercress (*Lepidium hyssopifolium*) — Hoary Sunray (*Leucochrysum albicans var. tricolor*) — Clandulla Geebung (*Persoonia marginata*) — *Persoonia mollis subsp. revoluta* — Dwarf Phyllota (*Phyllota humifusa*) — *Pimelea bracteata* — Cotoneaster Pomaderris (*Pomaderris cotoneaster*) — Delicate Pomaderris (*Pomaderris delicata*) — Pale Pomaderris (*Pomaderris pallida*) — Bago Leek-orchid (*Prasophyllum bagoense*) — Brandy Marys Leek-orchid (*Prasophyllum innubum*) — Kelton's Leek Orchid (*Prasophyllum keltonii*) — Tarengo Leek Orchid (*Prasophyllum petilum*) — Alpine Greenhood (*Pterostylis alipina*) — Slender Greenhood (*Pterostylis foliata*) — Blue-tongued Greenhood (*Pterostylis oreophila*) — Dwarf Bush-pea (*Pultenaea humilis*) — Woolly Ragwort (*Senecio garlandii*) — *Solanum armourense* — Small Purple-pea (*Swainsona recta*)		

Project[3]	Known or estimated native vegetation impacts (ha)	TECs impacted		Species credit species impacted	Native vegetation offsets (ecosystem credits) total	Threatened species offsets (species credits) total
		BC Act	EPBC Act			
				— Silky Swainson-pea (*Swainsona sericea*) — Alpine Sun-orchid (*Thelymitra alpicola*) — Austral Toadflax (*Thesium australe*) — Swamp Everlasting (*Xerochrysum palustre*) — Pink-tailed Legless Lizard (*Aprasia parapulchella*) — Bush Stone-curlew (*Burhinus grallarius*) — Gang-gang Cockatoo (*Callocephalon fimbriatum*) — Glossy Black-cockatoo (*Calyptorhynchus lathami*) — Eastern Pygmy-possum (*Cercartetus nanus*) — Large-eared Pied Bat (*Chalinolobus dwyeri*) — Sloane's Froglet (*Crinia sloanei*) — Alpine She-oak Skink (*Cyclodomorphus praealtus*) — Striped Legless Lizard (*Delma impar*) — White-bellied Sea-eagle (*Haliaeetus leucogaster*) — Little Eagle (*Hieraaetus morphnoides*) — Key's Matchstick Grasshopper (*Keyacris scurra*) — Booroolong Frog (*Litoria booroolongensis*) — Yellow-spotted Tree Frog (*Litoria castanea*) — Square-tailed Kite (*Lophoictinia isura*) — Broad-toothed Rat (*Mastacomys fuscus*) — Stuttering Frog (*Mixophyes balbus*) — Southern Myotis (*Myotis macropus*)		

Project[3]	Known or estimated native vegetation impacts (ha)	TECs impacted		Species credit species impacted	Native vegetation offsets (ecosystem credits) total	Threatened species offsets (species credits) total
		BC Act	EPBC Act			
				— Barking Owl (*Ninox connivens*) — Powerful Owl (*Ninox strenua*) — Greater Glider (*Petauroides Volans*) — Yellow Bellied Glider population om the Bago Plateau (*Petaurus australis*) — Squirrel Glider (*Petaurus norfolcensis*) and Squirrel Glider in the Wagga Wagga City Local Government Area — Pink Robin (*Petroica rodinogaster*) — Brush-tailed phascogale (*Phascogale tapoatafa*) — Koala (*Phascolarctos cinereus*) — Superb Parrot (*Polytelis swainsonii*) — Smoky Mouse (*Pseudomys fumeus*) — Golden Sun Moth (*Synemon plana*) — Masked Owl (*Tyto novaehollandiae*) — Sooty Owl (*Tyto tenebricosa*).		

Project[3]	Known or estimated native vegetation impacts (ha)	TECs impacted		Species credit species impacted	Native vegetation offsets (ecosystem credits) total	Threatened species offsets (species credits) total
		BC Act	EPBC Act			
Junction River Wind Farm (formerly Burrawong Wind Farm) (Assessment Phase)	Total of 75.68 ha within the South Olary Plain IBRA subregion	Two TECs: 1.17 hectares of Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions (endangered) 2.03 hectares of *Acacia melvillei* Shrubland in the Riverina and Murray-Darling Depression bioregions (endangered)	–	— A saltbush (*Atriplex infrequens*) — Crowned Gecko (*Lucasium stenodactylum*) — Painted Burrowing Frog (*Neobatrachus pictus*) — Pink Cockatoo (*Lophochroa leadbeateri*).	Total of 1,097 within the South Olary Plain IBRA subregion	Total of 1,789 within the South Olary Plain IBRA subregion
Keri Keri Wind Farm (Assessment Phase)	Total of 765.06 ha within the Murrumbidgee IBRA subregion	–	–	— Mossgiel Daisy (*Brachyscome papillosa*) — Chariot Wheels (*Maireana cheelii*)	Total of 22,703 within the Murrumbidgee IBRA subregion	Total of 7,661 within the Murrumbidgee IBRA subregion
Baldon Wind Farm (Assessment Phase)	Total of 769.35 ha This includes IBRA subregions: 769.19 ha in Murrumbidgee 0.16 ha in Robinvale Plains	–	One TEC: 1.12 hectares of Natural Grasslands of the Murray Valley Plains (critically endangered)	— Mossgiel Daisy (*Brachyscome papillosa*) — Bindweed (*Convolvulus tedmoorei*) — Spike-Rush (*Eleocharis obicis*) — Chariot Wheels (*Maireana cheelii*) — Slender Darling Pea (*Swainsona murrayana*) — Little Eagle (*Hieraaetus morphnoides*) — Southern Bell Frog (*Litoria raniformis*) — Southern Myotis (*Myotis macropus*)	Total of 17,422 This includes IBRA subregions: 17,417 in Murrumbidgee 5 in Robinvale Plains	Total of 21,293 This includes IBRA subregions: 21,293 in Murrumbidgee None in Robinvale Plains

Project[3]	Known or estimated native vegetation impacts (ha)	TECs impacted		Species credit species impacted	Native vegetation offsets (ecosystem credits) total	Threatened species offsets (species credits) total
		BC Act	EPBC Act			
Tchelery Wind Farm (Response to Submissions)	Total of 602.83 ha within the Murrumbidgee IBRA subregion	Three TECs: 27.80 ha of *Acacia melvillei* Shrubland in the Riverina and Murray-Darling Depression bioregions (critically endangered) 6.43 ha of Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregion (endangered) 0.83 ha of White Box Yellow Box Blakely's Red Gum grassy woodland and derived native grassland (critically endangered)	One TEC: 0.83 ha of White Box Yellow Box Blakely's Red Gum grassy woodland and derived native grassland (critically endangered)	— Mossgiel Daisy (*Brachyscome papillosa*) — Spike-Rush (*Eleocharis obicis*) — Winged Peppercress (*Lepidium monoplocoides*) — Chariot Wheels (*Maireana cheelii*) — Austral Pillwort (*Pilularia novae-hollandiae*) — Slender Darling Pea (*Swainsona murrayana*) — Southern Bell Frog (*Litoria raniformis*)	Total of 14,976 within the Murrumbidgee IBRA subregion	Total of 11,815 within the Murrumbidgee IBRA subregion

Project[3]	Known or estimated native vegetation impacts (ha)	TECs impacted		Species credit species impacted	Native vegetation offsets (ecosystem credits) total	Threatened species offsets (species credits) total
		BC Act	EPBC Act			
Pottinger Wind Farm (Approved)	Total of 1,002.62 ha for the Murrumbidgee IBRA subregions:	Three TECs: 0.02 ha of *Acacia melvillei* Shrubland in the Riverina and Murray-Darling Depression bioregions (critically endangered) 0.38 ha of Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions (endangered) 11.66 ha of Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions (endangered)	One TEC: 0.38 ha of Weeping Myall Woodlands (endangered)	— Mossgiel Daisy (*Brachyscome papillosa*) — Chariot Wheels (*Maireana cheelii*) — Austral Pillwort (*Pilularia novae-hollandiae*) — Silky Swainson-pea (*Swainsona sericea*) — Slender Darling Pea (*Swainsona murrayana*) — Southern Bell Frog (*Litoria raniformis*) — Pink Cockatoo (*Lophochroa leadbeateri*) — Plains-wanderer (*Pedionomus torquatus*).	Total of 22,262 This includes IBRA subregions: 22,262 in Murrumbidgee	Total of 19,527 This includes IBRA subregions: 19,527 in Murrumbidgee
Billabong Creek Environmental Water Regulators (Approved)	Total of 16.29 ha within the Murrumbidgee IBRA subregion	–	–	— Bush Stone-curlew (*Burhinus grallarius*) — Little Eagle (*Hieraaetus morphnoides*) — Southern Myotis (*Myotis macropus*) — Southern Bell Frog (*Litoria raniformis*) — Pink Cockatoo (*Lophochroa leadbeateri*) — Plains-wanderer (*Pedionomus torquatus*) — Slender Darling Pea (*Swainsona murrayana*)	Total of 429 within the Murrumbidgee IBRA subregion	Total of 794 within the Murrumbidgee IBRA subregion

Project[3]	Known or estimated native vegetation impacts (ha)	TECs impacted		Species credit species impacted	Native vegetation offsets (ecosystem credits) total	Threatened species offsets (species credits) total
		BC Act	EPBC Act			
Bullawah Wind Farm (Assessment Phase)	Total of 632.67 ha within the Murrumbidgee IBRA subregion	Two TECs: 22.8 ha of Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions (endangered) 57.61 ha of Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregion (endangered)	One TEC: 4.92 ha of Weeping Myall Woodlands (endangered)	— Spike-rush (*Eleocharis obicis*) — Winged Peppercress (*Lepidium monoplocoides*) — Chariot Wheels (*Maireana cheelii*) — Slender Darling Pea (*Swainsona murrayana*) — Silky Swainson-pea (*Swainsona sericea*) — Little Eagle (*Hieraaetus morphnoides*) — Barking Owl (*Ninox connivens*) — Southern Bell Frog (*Litoria raniformis*).	Total of 15,420 within the Murrumbidgee IBRA subregion	Total of 15,855 within the Murrumbidgee IBRA subregion
Romani Battery Energy Storage System (Response to Submissions)	Total of 17.97 ha within the Murrumbidgee IBRA subregion	–	–	–	Total of 481 within the Murrumbidgee IBRA subregion	None within the Murrumbidgee IBRA subregion
Dinawan Solar Farm (Approved)	Total of 1,771.34 ha within the Murrumbidgee IBRA subregion	One TEC: 918.3 ha of Myall Woodland in the Darling Riverine Plains, Brigalow Blet South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes and Bioregions (endangered)	Two TECs: 0.48 ha of Weeping Myall Woodlands (endangered) 1.73 ha of Natural Grasslands of the Murray Valley Plains (critically endangered)	— Slender Darling Pea (*Swainsona murrayana*) — Silky Swainsona-pea (*Swainsona sericea*) — Southern Bell Frog (*Litoria raniformis*). — Plains-wanderer (*Pedionomus torquatus*).	Total of 25,719 within the Murrumbidgee IBRA subregion	Total of 2,683 within the Murrumbidgee IBRA subregion

Project[3]	Known or estimated native vegetation impacts (ha)	TECs impacted		Species credit species impacted	Native vegetation offsets (ecosystem credits) total	Threatened species offsets (species credits) total
		BC Act	EPBC Act			
Dinawan Wind Farm (Assessment Phase)	Total of 948.56 ha within the Murrumbidgee IBRA subregion	Two TECs: 458.17 ha of Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions (Weeping Myall Woodland) – (Endangered) 48.87 of Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions (Sandhill Pine Woodland) – (Endangered)	Two TECs: 128.73 ha of Weeping Myall Woodland (Endangered) 76.87 ha of Natural Grasslands of the Murray Valley (Critically Endangered)	— *Austrostipa wakoolica* — *Brachyscome muelleroides* — Mossgiel Daisy (*Brachyscome papillosa*) — Grey Snake (*Hemiaspis damelii*) — Winged Peppercress (*Lepidium monoplocoides*) — Lanky Buttons (*Leptorhynchos orientalis*) — Southern Bell Frog (*Litoria raniformis*) — Chariot Wheels (*Maireana cheelii*) — Southern Myotis (*Myotis macropus*) — Plains-wanderer (*Pedionomus torquatus*) — Austral Pillwort (*Pilularia novae-hollandiae*) — Superb Parrot (*Polytelis swainsonii*) — *Sclerolaena napiformis* — Slender Darling Pea (*Swainsona murrayana*) — *Swainsona plagiotropis* — Silky Swainson-pea (*Swainsona sericea*)	Total of 21,696 within the Murrumbidgee IBRA subregion	Total of 57,457 within the Murrumbidgee IBRA subregion

Project[3]	Known or estimated native vegetation impacts (ha)	TECs impacted		Species credit species impacted	Native vegetation offsets (ecosystem credits) total	Threatened species offsets (species credits) total
		BC Act	EPBC Act			
Mangoplah Battery Energy Storage System (Response to Submissions)	Total of 2.00 ha within the Inland Slopes IBRA subregion	0.15 ha of Grey Box Grassy Woodlands and Derived Native Grasslands of South-eastern Australia (endangered) 1.85 ha of White Box Yellow Box Blakely's Red Gum grassy woodland and derived native grassland (critically endangered)	0.22 ha of White Box Yellow Box Blakely's Red Gum grassy woodland and derived native grassland (critically endangered)	— *Austrostipa wakoolica* — *Euphrasia arguta* — Yass Daisy (*Ammobium craspedioides*) — Barking Owl (*Ninox connivens*) — Golden Sun Moth (*Synemon plana*) — Masked Owl (*Tyto novaehollandiae*) — Southern Myotis (*Myotis macropus*) — Squirrel Glider (*Petaurus norfolcensis*) and Squirrel Glider in the Wagga Wagga LGA — Striped Legless Lizard (*Delma impar*)	Total of 46 within the Inland Slopes IBRA subregion	Total of 264 within the Inland Slopes IBRA subregion
Yanco Delta Wind Farm (Approved)	A total of 174.21 ha within the Murrumbidgee IBRA subregion	Two TECs: 31.25 ha of Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions (endangered) 10.28 ha of Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions (endangered)	Two TECs: 174.21 ha of Natural Grasslands of the Murray Valley Plains (critically endangered) 5.17 ha of Weeping Myall Woodland (Endangered)	— *Austrostipa wakoolica* — Small Scurf-pea (*Cullen parvum*) — Austral Pillwort (*Pilularia novae-hollandiae*) — Slender Darling Pea (*Swainsona murrayana*) — Southern Myotis (*Myotis macropus*) — Plains-wanderer (*Pedionomus torquatus*).	A total of 8,623 within the Murrumbidgee IBRA subregion	A total of 2,337 within the Murrumbidgee IBRA subregion

Project[3]	Known or estimated native vegetation impacts (ha)	TECs impacted		Species credit species impacted	Native vegetation offsets (ecosystem credits) total	Threatened species offsets (species credits) total
		BC Act	EPBC Act			
Gregadoo Solar Farm (Approved)	Total of 2.1 ha within the Inland Slopes IBRA subregion	–	One TEC: 0.02 ha of White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (critically endangered)	— Superb Parrot (*Polytelis swainsonii*) — Glossy Black Cockatoo (*Calyptorhynchus lathami*) — Masked Owl (*Tyto novaehollandiae*) — Sloane's Froglet (*Crinia sloanei*).	Total of 36 within the Inland Slopes IBRA subregion	Total of 14 within the Inland Slopes IBRA subregion
Inland Rail (Albury to Illabo) (Approved)	A total of 4.57 ha This includes IBRA subregions: 0.16 ha in Lower Slopes 4.41 ha in Inland Slopes	One TEC: 2.84 ha of White Box Yellow Box Blakely's Red Gum grassy woodland and derived native grassland (critically endangered)	One TEC: 0.50 ha of White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (critically endangered)	— Sloanes Froglet (*Crinia sloanei*) — Key's matchstick Grasshopper (*Keyacris scurra*) — Squirrel Glider (*Petaurus norfolcensis*) — Superb Parrot (*Polytelis swainsonii*).	A total of 139 This includes IBRA subregions: 3 in Lower Slopes 136 in Inland Slopes	A total of 99 This includes IBRA subregions: 8 in Lower Slopes 91 in Inland Slopes
Subtotals						
Related development, proposed and approved projects	A total of 9,266.61 ha This includes IBRA subregions: 7,692.61 ha in Murrumbidgee 382.66 ha in Inland Slopes None in Murray Fans	N/A	N/A	N/A	A total of 208,163 This includes IBRA subregions: 179,497 in Murrumbidgee 5,875 in Inland Slopes None in Murray Fans	A total of 387,792 This includes IBRA subregions: 177,966 in Murrumbidgee 37,128 in Inland Slopes None in Murray Fans

Project[3]	Known or estimated native vegetation impacts (ha)	TECs impacted		Species credit species impacted	Native vegetation offsets (ecosystem credits) total	Threatened species offsets (species credits) total
		BC Act	EPBC Act			
VNI West (NSW) (this project)						
This project	A total of 1,265.38 ha This includes IBRA subregions: Inland Slopes 30.03 ha Murrumbidgee 958.14 ha Murray Fans 277.21 ha	Six TECs: *Acacia melvillei* Shrubland in the Riverina and Murray-Darling Depression bioregions (9.58 ha) *Allocasuarina luehmannii* Woodland in the Riverina and Murray-Darling Depression Bioregions (2.03 ha) Inland Grey Box Woodlands in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions (0.59 ha) Myall Woodlands in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions (159.89 ha)	Six TECs: Buloke woodlands of the Riverina and Murray Darling Depression bioregions (2.03 ha) Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia (0.59 ha) Natural Grasslands of the Murray Valley Plains (81.04 ha) Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains (0.19 ha) Weeping Myall Woodlands (77.77 ha) White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (2.71 ha)	— Mossgiel Daisy (*Brachyscome papillosa*) — Spike Rush (*Eleocharis obicis*) — Chariot Wheels (*Maireana cheelii*) — Austral Pillwort (*Pilularia novae-hollandiae*) — Slender Darling-pea (*Swainsona murrayana*) — Bush-stone Curlew (*Burhinus grallarius*) — Pink Cockatoo (*Lophochroa leadbeateri*) — Plains-wanderer (*Pedionomus torquatus*) — Southern Bell Frog (*Litoria raniformis*).	A total of 33,258 This includes IBRA subregions: Inland Slopes 106 Murrumbidgee 29,112 Murray Fans 4040	A total of 55,068 This includes IBRA subregions: Inland Slopes 187 Murrumbidgee 42,415 Murray Fans 12,466

Project[3]	Known or estimated native vegetation impacts (ha)	TECs impacted		Species credit species impacted	Native vegetation offsets (ecosystem credits) total	Threatened species offsets (species credits) total
		BC Act	EPBC Act			
		Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions (35.23 ha) White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions (16.4 ha)				
Grand total						
Cumulative Total	**A total of 10,531.99**	**N/A**	**N/A**	**N/A**	**A total of 241,421**	**A total of 442,860**

O2.2 Cumulative impacts on groundwater dependent ecosystems

As outlined in the *Technical paper 10 – Groundwater impact assessment* (WSP 2025a) the majority of GDEs relevant to this project are located between the Murray River at the NSW/Victorian border and the town of Moulamein. There is a small risk to these GDEs from groundwater levels and quality changes that may occur as a result of construction activities such as excavations, piling of soils and spills which could lead to contamination. However, there is an overall low risk of groundwater level and water quality changes from the project as the majority of construction activities would be localised impacts with earthworks generally too shallow to intersect the water table. Controls would also be used to manage erosion and sediment controls and runoff impacts from the project. This assessment concluded that the project is generally considered to have a low risk of impact to GDEs and consequently is unlikely to significantly contribute to the cumulative impacts on GDEs.

The ecological impact to GDEs is covered in section 9.3.5.2 of the BDAR, including potential direct impacts to the GDE.

The potential cumulative impacts to groundwater dependent ecosystems (GDEs) are outlined in Table O.4.

The results from the review of available information indicates the following:

- The Atlas of GDEs (Bureau of Meteorology 2025) and relevant water sharing plans identifies many potential GDEs in and around these future relevant projects.
- All relevant future projects, including this project, are not anticipated to impact groundwater during construction, operation or decommissioning due to the limited amount of subsurface disturbance activities required during the installation and decommissioning of project infrastructure.

Considering the above, it is concluded that the project is unlikely to contribute to cumulative impacts on GDEs.

Table O.4 Potential cumulative impacts on relevant future projects on GDEs

Relevant future project	Impacts on groundwater dependent ecosystems
VNI West (Victoria)	Impacts on GDEs not yet assessed.
EnergyConnect (NSW – Eastern Section)	EnergyConnect (NSW – Eastern Section) would not impact on groundwater and it is considered unlikely to lead to any adverse impact on the groundwater availability or status for GDEs.
HumeLink	Proposed construction and operational activities associated with HumeLink are unlikely to pose a significant risk to groundwater dependent ecosystems given impacts to groundwater quality and flow would be negligible.
Junction Rivers Wind Farm (formerly Burrawong Wind Farm)	The Forest Creek within the subject land of Junction Rivers Wind Farm has been subject to clearing for the purpose of grazing activities and occurs in a modified state, including the presence of a dam. It is unlikely that Junction Rivers Wind Farm would result in a major change to the surface drainage, groundwater recharge or discharge of the subject land or surrounding areas.
Keri Keri Wind Farm	Impacts to GDEs are not anticipated.
Wilan Wind Farm	Impacts on GDEs not yet assessed.
Baldon Wind Farm	Impacts on GDEs considered highly unlikely to occur.
Tchelery Wind Farm	Impacts to GDEs are not anticipated.
Abercrombie Wind Farm	Impacts on GDEs not yet assessed.
Wanganella Wind Farm	Impacts on GDEs not yet assessed.
Pottinger Wind Farm	Impacts to GDEs are not anticipated.

Relevant future project	Impacts on groundwater dependent ecosystems
Pottinger Solar Farm	Impacts on GDEs not yet assessed.
Billabong Creek Environmental Water Regulators	No groundwater would be intercepted as a result of the Billabong Creek Environmental Water Regulators project. As such, impacts considered unlikely to occur.
Bullawah Wind Farm	Generally, impacts to groundwater resources, including GDEs, are very unlikely given the groundwater table is not at risk of being intercepted during construction or decommissioning of Bullawah Wind Farm.
Romani Battery Energy Storage System	Impacts to GDEs are not anticipated.
West Nyangay Solar Farm	Impacts on GDEs not yet assessed.
Conargo Wind Farm	Impacts on GDEs not yet assessed.
Dinawan Solar Farm	Overall, the Dinawan Solar Farm has been assessed to not have any material impact on groundwater flows, so impacts to GDEs are considered unlikely to occur.
Dinawan Wind Farm	No impacts to GDEs.
Argoon Wind Farm	Impacts on GDEs not yet assessed.
Belhaven Battery Energy Storage System	Impacts on GDEs not yet assessed.
Livingstone Solar Farm	Impacts on GDEs not yet assessed.
Mangoplah Battery Energy Storage System	Impacts to GDEs are not anticipated.
Yanco Delta Wind Farm	Based on the relatively deep and uniform regional water table depths, the potential GDEs and High Priority GDEs within the Project area of Yanco Delta Wind Farm are considered unlikely to be relying on the regional water table. Instead, if reliant on groundwater, these are interpreted to be associated with perched groundwater systems situated in marshy areas which are recharged by rainfall and floodwaters.
Gregadoo Solar Farm	No impacts to GDEs.
Inland Rail (Albury to Illabo)	The assessment concluded that the Inland Rail (Albury to Illabo) complies with Level 1 criteria under the *NSW Aquifer Interference Policy*, under which impacts to GDEs are considered acceptable.
VNI West (NSW)	
VNI West (NSW) (this project)	Five high priority terrestrial GDEs occur within the study area and are situated between the Murray River at the NSW/Victorian border and Moulamein. These GDEs are comprised of Semi-arid Woodland and Forested Wetland vegetation formations. No high priority aquatic GDEs were identified.

O2.3 Cumulative impacts on ecological functions

The potential cumulative impacts to ecological function, including wildlife connectivity and habitat corridors are outlined in Table O.5. The results from the review of available information indicate that:

- many of the relevant future projects occur on land where the connectivity of native vegetation and habitat corridors has been previously compromised by clearing for agricultural land uses
- the relevant future projects are likely to result in short term impacts resulting in species relocating outside of the development footprints. Once construction is completed, species are expected to move back into habitats adjacent to the relevant future project. Long term impacts could include permanent breaks in connectivity due to installation of fence lines and access roads across large intact blocks of habitat. Some of these project's designs have considered and/or implemented wildlife crossing structures (e.g. glider poles, canopy plantings, multi-use culverts) that may retain or improve wildlife connectivity in association with these projects
- 13 of these projects are identified as wind farms and are likely to involve disruptions to flight paths and migration patterns for some species from moving wind turbines. These project have undertaken, or likely will undertake detailed assessments into mitigating the potential for bird strikes with wind turbines. This has included reducing the number, location and design of the wind turbines in these projects
- the relevant future projects are likely to reduce the integrity of current corridors and connectivity.

VNI West (NSW) occurs in a landscape that has already been highly fragmented due to historical clearing and agricultural activities. However, some landscape connectivity remains, particularly as the project passes through some connectivity corridors including watercourses which are connected to state forests and conservation areas in the Murray Fans IBRA subregion. Connectivity impacts from this project largely relate to removal of canopy connectivity. These impacts are most likely to affect aerial species such as birds, bats and arboreal mammals. Bird and bat species are also most at risk of mortality impacts from towers and associated powerlines, though mortality impacts are likely to reduce over time as species adapt to the infrastructure.

Despite these impacts, the project would result in a highly permeable structure for biodiversity, and connectivity impacts are expected to be minimal for all species and reduce over time as biodiversity acclimatises to the presence of the towers and powerlines. The impacts to connectivity are expected to be permanent, though minor. It is expected that the long-term viability of existing habitat patches is likely to remain post-construction. The design and route planning process for the project would aim to minimise impacts to sensitive habitat areas, waterways and remnant tree stands. The consequence of the impacts would be minor and non-significant as a result of the design development process.

In conclusion, cumulative impacts to wildlife connectivity and habitat corridors from the project and relevant future projects have the potential to reduce the integrity of current corridors and connectivity. However, this impact is expected to be small in magnitude since the future relevant projects under consideration occur, like the project, on land where the connectivity of native vegetation and habitat corridors has been previously compromised by clearing for agricultural land uses. Additional indirect and prescribed impacts to bird and bat species have been identified and considered across these projects that have potential to result in mortality impacts due to the infrastructure (i.e. wind turbines, transmission towers and associated powerlines) in these projects.

Table O.5 Potential impacts of key relevant future projects on ecological function

Project	Impacts on ecological function
VNI West (Victoria)	Impacts on wildlife connectivity not assessed/publicly available.
EnergyConnect (NSW – Eastern Section)	EnergyConnect (NSW – Eastern Section) would result in a highly permeable structure for biodiversity and connectivity is expected to remain largely unaffected for all species. Connectivity, however, may be impacted to some degree, particularly for aerial species, however such impacts are not expected to be significant. Indirect impacts on native vegetation are considered unlikely due to the longer-term retention of shrub and ground stratum native vegetation retention to a height of between four and 10 metres in areas buffering direct permanent loss. Mitigation measures would ensure any residual indirect impact to native vegetation is managed during both the construction and operational phases of this project.
HumeLink	The consequence of the impacts of HumeLink to wildlife connectivity are minor. However, indirect impacts to avifauna and flying mammals may occur due to the potential for increased risk of collision with transmission lines and electric and magnetic fields associated with the new infrastructure. Impacts to terrestrial species that may be subject to open-space barrier are to be addressed within the Connectivity Strategy where they occur within proximity to the project.
Junction Rivers Wind Farm (formerly Burrawong Wind Farm)	Increased fragmentation within the finer scale of the subject land is expected as a result of the Junction Rivers Wind Farm through the removal of native vegetation. Connectivity as a result will be impacted but is considered minor at a large scale due to the presence of key connectivity corridors in the form of native vegetations and Travelling Stock Reserves. No indirect impacts are expected to occur as a result of the proposed wind farm to the Yanga National Park, Yanga Nature Reserve, or the Yanga State Conservation Area. A detailed risk assessment, evaluation of movement of waterbird species through the subject land has occurred. The results of this assessment have included rigorous avoidance, minimisation and mitigation measures to ensure connectivity remains within the broader landscape. This project states that it has limited potential to result in impacts to habitat connectivity for some species potentially flying through its wind farm to access habitats as part of migratory movements or long-range foraging. However, it notes that habitat connectivity is maintained surrounding the development footprint and the likelihood of regular migratory movements through the wind farm at RSA height is considered unlikely.
Keri Keri Wind Farm	No impacts to wildlife connectivity, however prescribed impacts including risk of turbine strikes have been anticipated, with collision risk modelling for bird and bat turbine strike undertaken to guide design amendments.
Wilan Wind Farm	Impacts on wildlife connectivity not assessed/publicly available, however its proximity to neighbouring wind farms may have a cumulative effect from potential turbine strikes.

Project	Impacts on ecological function
Baldon Wind Farm	Baldon Wind Farm has the potential to reduce connectivity through clearing. Existing movement opportunities for the majority of species within the Project Area will not be reduced by the linear and discrete nature of the wind farm project. The loss of vegetation associated with the development footprint is unlikely to have an impact that could cause a decline to threatened species. The key biodiversity impact for this project is the potential to have ongoing population impacts on birds or bats that are either excluded from the Development Footprint or injured by operational turbines. Extensive bird and bat utilisation data has been undertaken to ensure that turbine placements minimise potential impacts.
Tchelery Wind Farm	There is no evidence to suggest that a single corridor exists through the project site, in preference to the surrounding region, but there is likely a regional exchange of birds between significant drainage lines (Murrumbidgee/Lachlan Rivers to the north and Murray River to the south) and wetlands locally, particularly during those times when local wetlands are recharged and attracting coastal waterbird populations to inland areas. Prescribed impacts from wind turbine strikes were assessed for bird and bat species that utilize the project area for foraging. While potential loss of foraging habitat for raptors and aerial forages was predicted, bat foraging habitat is not expected to be impacted, due to the placement of the turbines more than 200m away from edges of wooded habitat, where bats forage.
Abercrombie Wind Farm	Impacts on wildlife connectivity not assessed/publicly available, however its proximity to neighbouring wind farms may have a cumulative effect from potential turbine strikes.
Wanganella Wind Farm	Impacts on wildlife connectivity not assessed/publicly available, however its proximity to neighbouring wind farms may have a cumulative effect from potential turbine strikes.
Pottinger Wind Farm	The project is expected to reduce the width of habitat connectivity areas but will not remove any key areas of connectivity for aquatic, arboreal or terrestrial species. Key connectivity through the subject land, to important wildlife corridors will be maintained, including woodland, waterways, shrubland and grassland. The project will not result in the loss of, or substantial impacts to key functional corridors within the landscape. It is expected that fauna species will continue to utilise the existing corridors within the subject land and broader landscape, with minor or negligible impact to movement patterns and/or population viability. The project has limited potential to result in impacts to habitat connectivity for some species potentially flying through the wind farm to access habitats as part of migratory movements or long-range foraging. However, habitat connectivity is maintained surrounding the disturbance footprint and the likelihood of regular migratory movements through the wind farm at RSA height is considered unlikely.
Pottinger Solar Farm	Impacts on wildlife connectivity not publicly available.
Billabong Creek Environmental Water Regulators	Vegetation clearing within the contractor activity zone and proposed clearing areas of the Billabong Creek Environmental Water Regulators project would reduce connectivity through the proposal footprint by decreasing shelter and creating physical barriers within these discrete areas. However, the project is unlikely to isolate any areas of habitat or sever any connecting links.

Project	Impacts on ecological function
Bullawah Wind Farm	Removal of native vegetation may impede movement of species such as Southern Bell Frog and Plains-wanderers between areas of suitable habitat within the Project Area of Bullawah Wind Farm. Effective avoidance measures are to be employed to reduce the impacts of habitat fragmentation. Further mitigation measures have been applied to this project based on its Prescribed Impact Assessment for Wind Turbine Strikes.
Romani Battery Energy Storage System	This project would occupy a small part of a very large patch of continuous non-woody vegetation. The continuity of this vegetation would not be compromised. No prescribed impacts are deemed to occur with this project.
West Nyangay Solar Farm	Impacts on wildlife connectivity not publicly available.
Conargo Wind Farm	Impacts on wildlife connectivity not assessed/publicly available, however its proximity to neighbouring wind farms may have a cumulative effect from potential turbine strikes.
Dinawan Solar Farm	Habitat connectivity is critical for maintaining healthy populations, as it promotes biological diversity through the exchange of genes. However, the subject land is largely cleared and fragmented in regard to woody vegetation and does not form part of a recognised wildlife corridor, however, does contain some important linkages to surrounding habitats. Mature woody vegetation within the broader locality is generally consigned to Black Box dominated riparian areas and patches of intact Weeping Myall woodland that have been prioritised for avoidance during detailed design.
Dinawan Wind Farm	The project may to reduce the width of habitat connectivity areas but will not remove any key areas of connectivity for aquatic, arboreal or terrestrial species. Key connectivity through the subject land, to external wildlife corridors will be maintained, including woodland, waterways, shrubland and grassland. The project will not result in the loss of, or substantial impacts to key functional corridors within the landscape. It is expected that fauna species will continue to utilise the existing corridors within the subject land and broader landscape, with minor or negligible impact to movement patterns and/or population viability. The project has limited potential to result in impacts to habitat connectivity for some species potentially flying through the wind farm to access habitats as part of migratory movements or long-range foraging. However, habitat connectivity is maintained surrounding the development corridor and the likelihood of regular migratory movements through the wind farm at RSA height is considered low.
Argoon Wind Farm	Impacts on wildlife connectivity not assessed/publicly available, however its proximity to neighbouring wind farms may have a cumulative effect from potential turbine strikes.
Belhaven Battery Energy Storage System	Impacts on wildlife connectivity not publicly available.
Livingstone Solar Farm	Impacts on wildlife connectivity not assessed/publicly available.
Mangoplah Battery Energy Storage System	Movement of both terrestrial and aerial species is unlikely to be substantially impeded by the proposal given whole patches of vegetation are not being removed.

Project	Impacts on ecological function
Yanco Delta Wind Farm	The Yanco Delta Wind Farm would increase levels of fragmentation within the region, it would not, however, occur to the extent where species or communities are significantly impacted. The project is not expected to have major impacts to the lifecycles of threatened and migratory species are there are more favourable migration and breeding locations in the region, including Murrumbidgee River, Murray River, Lake Urana and Lake Coolah. Blake strike collision may impact numerous bird and bat with a moderate to high-risk rating and affect their home range, their dispersal and genetic exchange in the landscape.
Gregadoo Solar Farm	No significant connectivity features in or adjacent to development site of Gregadoo Solar Farm. As such, impacts from development negligible. Roadside vegetation along Redbank and Boiling Down Roads, Western Grey Box tall grassy woodland in the south-east of the development site, and Blakely's Red Gum – Yellow Box tall grassy woodland along Boiling Down Creek, provide corridors of habitat connectivity for the Superb Parrot and Yellow-bellied Sheathtail bat. The development footprint intersects with this habitat in the 30 m wide easement for the transmission line across Boiling Down Creek and through the Western Grey Box woodland. There would also be some short-term, indirect disturbance associated with construction.
Inland Rail (Albury to Illabo)	The operation of the Inland Rail (Albury to Illabo) is likely to result in minor increases in localised fragmentation of the regional wildlife patches along the creek lines and road reserves. Due to the importance of connectivity, dispersal opportunities and habitat quality for species at a local scale, this impact has the potential to be negative to the dispersal of relatively sedentary species such as mammals, frogs and reptiles. The operation of the Inland Rail (Albury to Illabo) is considered unlikely to result in a large increase to landscape scale fragmentation and to further limit connectivity and movement corridors than what already exists in the proposal site, as it occurs within an already highly fragmented landscape with limited large patches of remnant vegetation. Overall, the potential for habitat connectivity impacts during operation is low.

O2.4 Cumulative impacts on protected lands

Protected areas are set aside for conservation and managed by the NSW National Parks and Wildlife Service, and include areas such as national parks, nature reserves, regional parks and state conservation areas. The cumulative impacts to protected and sensitive lands are outlined in Table O.6. The results from the review of available information indicate:

- the current project is adjacent to two protected lands: Murray Valley National Park and South West Woodland Nature Reserve
- several of the relevant future projects occur within or adjacent to protected lands (EnergyConnect (NSW Eastern), HumeLink, Junction Rivers Wind Farm, Keri Keri Wind farm, Wilan Wind Farm, Bullawah Wind Farm
- these project designs have been altered to avoid and minimise impacts on protected lands where possible.

Table O.6 Potential impacts of relevant future projects on protected lands

Project	Impacts on protected lands
VNI West (Victoria)	Impacts on protected lands not yet assessed.
EnergyConnect (NSW – Eastern Section)	Direct impacts on Yanga State Conservation Area.
HumeLink	No direct impacts on protected lands, however several national parks and reserves located within the vicinity of the project – Tarlo River National Park and Minjary National Park within 10 m of the project footprint.
Junction Rivers Wind Farm (formerly Burrawong Wind Farm)	Potential indirect impacts on Yanga National Park
Keri Keri Wind Farm	Potential impacts to Yanga State Conservation Area – mainly erosion and sedimentation from surface water run-off, bushfire risk and introduction of invasive/noxious species.
Wilan Wind Farm	Impacts on protected lands not yet assessed, however issued SEARs mention potential direct and indirect impacts to Yanga State Conservation Area and Yanga Nature Reserve.
Baldon Wind Farm	No direct impacts on protected lands.
Tchelery Wind Farm	No impacts on protected lands.
Abercrombie Wind Farm	Impacts on protected lands not yet assessed.
Wanganella Wind Farm	Impacts on protected lands not yet assessed.
Pottinger Wind Farm	No impacts on protected lands.
Pottinger Solar Farm	Impacts on protected lands not yet assessed.
Billabong Creek Environmental Water Regulators	No impacts on protected lands.
Bullawah Wind Farm	The project adjoins the Oolambeyan National Park, which was consequently considered in modifications to the design and reduced the Project Area and removed infrastructure that had potential to impact waterways which traversed both the National Park boundary. The closest turbines exceed the recommended buffer (300 m) from the National Park by 150 metres.
Romani Battery Energy Storage System	No impacts on protected lands.
West Nyangay Solar Farm	Impacts on protected lands not yet assessed.
Conargo Wind Farm	Impacts on protected lands not yet assessed.
Dinawan Solar Farm	No impacts on protected lands.
Dinawan Wind Farm	No impacts on protected lands.
Argoon Wind Farm	Impacts on protected lands not yet assessed.
Belhaven Battery Energy Storage System	Impacts on protected lands not yet assessed.
Livingstone Solar Farm	Impacts on protected lands not yet assessed.

Project	Impacts on protected lands
Mangoplah Battery Energy Storage System	No impacts on protected lands.
Yanco Delta Wind Farm	No impacts on protected lands.
Gregadoo Solar Farm	No impacts on protected lands.
Inland Rail (Albury to Illabo)	No impacts on protected lands.
VNI West (NSW)	
VNI West (NSW) (this project)	Potential impacts of fragmentation and degradation to Murray Valley National Park and South West Woodland Nature Reserve due to clearing of vegetation immediately adjacent to parcels of protected land. While clearing isn't likely to occur directly in these areas, there is the potential for edge effects and changes to connectivity to these protected areas which may lead to an indirect impact.

O3 Conclusion

The assessment of cumulative impacts, the incremental effect of multiple sources of impact (past, present and future), provides an opportunity to consider this project within a strategic context. The accumulating impacts of multiple projects, continuing agricultural activities, and development and maintenance of infrastructure will likely result in continued loss of biodiversity.

The cumulative vegetation removal impacts of the future projects (including the current project) considered in this cumulative assessment amount to an estimated 10,531.99 hectares of remnant vegetation removal. The cumulative ecosystem credit requirements equate to 241,421 and species credits are 442,860.

Relevant future projects, including this project, are not anticipated to impact groundwater during construction, operation or decommissioning due to the limited amount of subsurface disturbance activities required during the installation and decommissioning of project infrastructure. This project would be unlikely to contribute to the cumulative impacts on GDEs.

This project would have minor impacts to connectivity and would be unlikely to significantly contribute to the cumulative impacts to wildlife connectivity and habitat corridors.

The project is located adjacent to two protected lands (Murray Valley National Park and South West Woodland Nature Reserve) and is likely to have local prescribed impacts on these areas. These two protected areas would not be impacted, however, by any of the future relevant projects under consideration and as such, cumulative impacts on protected lands are not anticipated.

Appendix P

Remote access

Remote assessment of biodiversity values for VNI West memo

To:	Department of Climate Change, Energy, the Environment and Water
From:	Alex Cockerill
Subject:	**Application for Remote Assessment of biodiversity values – VNI West**
Our ref:	AppP_Remote access
Date:	**5 June 2026**

P1. Introduction

WSP have been engaged by Transgrid to undertake biodiversity assessments in accordance with the BAM for the proposed Victoria-New South Wales Interconnector (VNI) West (NSW) amended project (referred to as 'the amended project'). The amended project was declared a Critical State Significance Infrastructure (CSSI) under Section 5.13 of the *Environmental Planning and Assessment Act, 1979 (EP&A Act)* on 19 June 2024 and has had Secretary's Environmental Assessment Requirements (SEARs) issued. To date WSP has prepared the Environmental Impact Statement (EIS) and associated *Technical Paper 1 - Biodiversity Development Assessment Report (BDAR)* in accordance with the requirements of the SEARs. The exhibition BDAR adopted assumed presence for threatened entities on properties with restricted access due to the absence of targeted species surveys during optimal survey periods.

The current stage of the EIS is the preparation of an Amendment Report and Submission Report following the exhibition of the EIS. As part of this next phase of works, WSP has applied the *Remote assessment of biodiversity values: Biodiversity Assessment Method guide* (DCCEEW, 2025) (the guide) and appended this memo to the amendment BDAR.

This memo aims to provide information to support the request to apply the guide and seeks approval from the Department.

Transgrid's submission to the BOS helpdesk (email dated May 22, 2025) and consultation with the regional planning team at Conservation Programs, Heritage and Regulations (CPHR) (May-June 2025) have provided preliminary in principle support to apply the guide in relation to the private properties with no land access agreements in place. The response from the BOS Helpdesk on 18 July 2025, indicated ongoing consultation with the Department was required for application of the guide. On 25 August 2025, additional information was supplied to the Department for review with further discussions occurring on 15 September 2025 and 13 November 2025. Further amendments to this memo were undertaken in early 2026 as part of the assessment changes in the amendment BDAR.

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WSP acknowledges that every project we work on takes place on First Peoples lands.
We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

WSP Australia Pty Limited ABN 80 078 004 798

This memo includes an assessment of environmental characteristics of the restricted areas through available relevant desktop resources and provides a comparison of these areas with surrogate sites within the amended project's footprint. The information considered includes:

- similarity in IBRA subregions, plant community types (PCTs), broad vegetation condition states, land use history, soils, landscape position and mean annual rainfall
- records of threatened species, including records from BioNet Atlas (DCCEEW, 2026) within the local area including populations identified during field verification survey for the project, and
- similarity in native vegetation in the same broad conditions states as well as patch size and habitat connectivity for fauna species.

A review of vegetation mapping, threatened ecological communities (TECs) and relevant candidate species listed under the *Biodiversity Conservation Act 2016 (BC Act)* and *Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act)* within the restricted-access holdings has been undertaken in accordance with section 3.2.1 and section 3.2.3 of the guide and is presented below.

A surrogate site is an accessible area that has been selected for the assessment of biodiversity values in accordance with the BAM through the collection of on-ground data that is considered representative of the restricted-access holding. In accordance with the guide, the surrogate site must have similar features to the restricted-access holding including landscape position, soil type, vegetation type and condition and be within the same IBRA subregion as the restricted-access holding.

A summary of the proposed surrogate survey information used to inform assumptions with regard to species in the assessment area, including:

- where surrogate site/s are proposed to determine presence
- proximity to inaccessible area
- survey approach used in the surrogate site to determine the species presence in accordance with section 5.3 of the BAM
- limitations in relation to the application of the surrogate data to estimate presence of the species in the inaccessible areas, and
- spatial data prepared in accordance with Appendix D of the BAM Stage 2 Operations Manual.

The application of the guide is only proposed for restricted-access holdings within the Murrumbidgee and Murray Fans IBRA subregions.

P2. Sites proposed for application of the guide

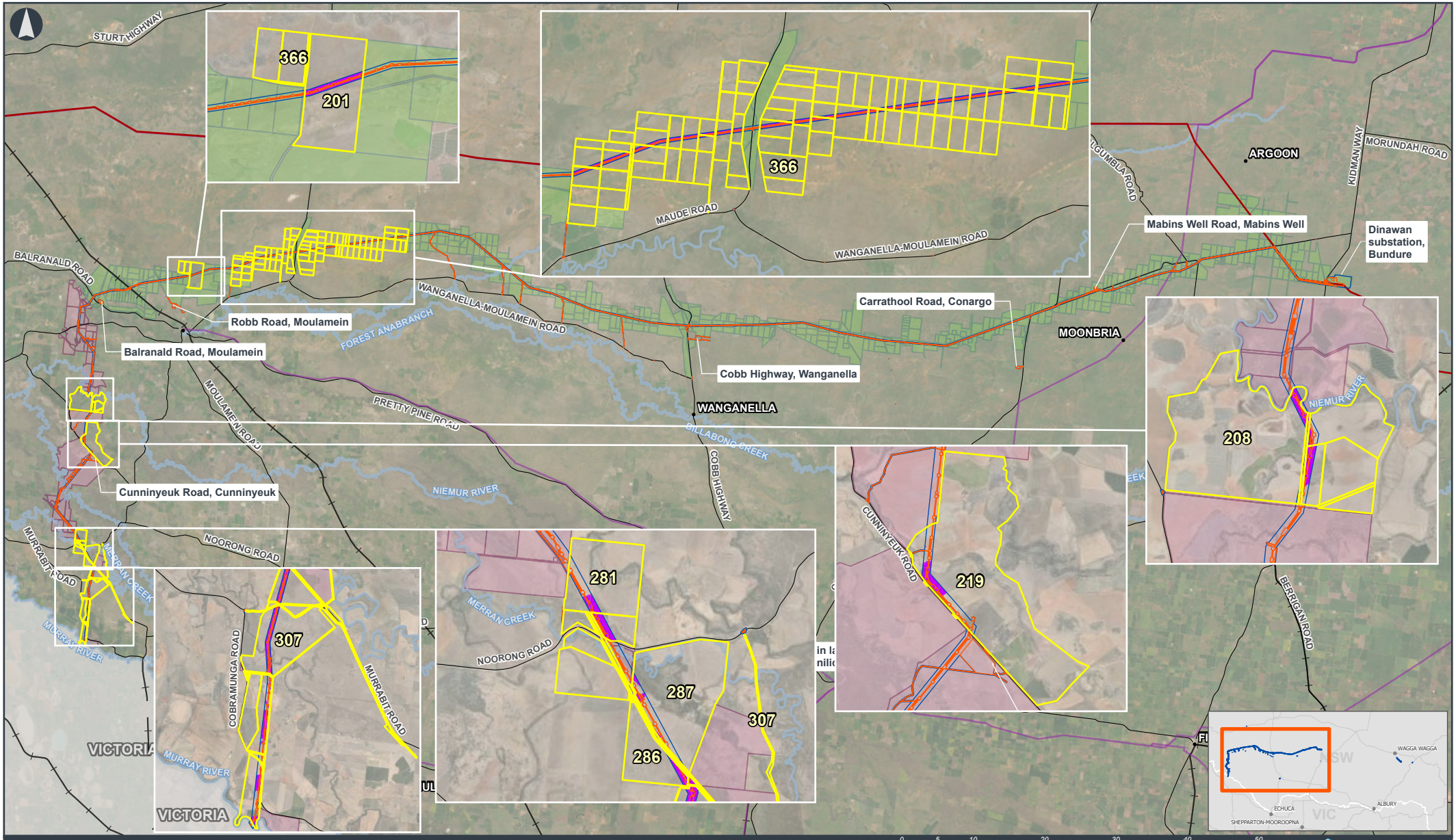
The guide has been applied to private land holdings where consent to enter applications have been restricted, including where access was revoked during critical survey periods for threatened species. Eight restricted-access holdings have been identified for application of the guide. Table P2.1 outlines the properties proportion in regard to the total amended project footprint and the justification for inclusion in the assessment, while Figure P2.1 provides visual representation of each holding.

Table P2.1 Restricted-access holdings proportion in regard to the amended project footprint and justification for the application of the guide

Holding #	Area (ha)	% of the amended project footprint	IBRA Sub-region	Justification for inclusion in application of the guide		
				Vegetation mapping	Candidate threatened flora species	Candidate threatened fauna species
201	38.7	0.64%	Murrumbidgee	Land access was permitted for a brief period in 2025 that allowed for flora survey effort in the form of: — vegetation mapping. As such, the guide has not been applied to vegetation mapping within this holding.	Access was revoked during critical survey periods for threatened flora species. The guide has been applied to candidate flora species assumed present within this holding.	Land access restrictions inhibited all ecology survey effort within this holding, and the guide has been applied to candidate fauna species assumed present within this holding.
208	54.0	0.89%	Murray Fans	Land access restrictions inhibited all ecology survey effort within this holding. Where possible, survey effort was undertaken via public access and other private land holdings where access was permitted. However, survey information was extremely limited, and the guide has been applied to vegetation mapping.	Land access restrictions inhibited all ecology survey effort within this holding, and the guide has been applied to candidate flora species assumed present within this holding.	Land access restrictions inhibited all ecology survey effort within this holding, and the guide has been applied to candidate fauna species assumed present within this holding.
219	64.6	1.07%	Murray Fans	Land access restrictions inhibited all ecology survey effort within this holding. Where possible, survey effort was undertaken via public access and other private land holdings where access was permitted. However, survey information was extremely limited, and the guide has been applied to vegetation mapping.	Land access restrictions inhibited all ecology survey effort within this holding, and the guide has been applied to candidate flora species assumed present within this holding.	Land access restrictions inhibited all ecology survey effort within this holding, and the guide has been applied to candidate fauna species assumed present within this holding.

Holding #	Area (ha)	% of the amended project footprint	IBRA Sub-region	Justification for inclusion in application of the guide		
				Vegetation mapping	Candidate threatened flora species	Candidate threatened fauna species
281	37.4	0.62%	Murray Fans	Land access restrictions inhibited all ecology survey effort within this holding. However, survey effort in the form of vegetation mapping was completed via public access and other private land holdings where access was permitted for the entirety of impacted land within this holding. Therefore, the guide has not been applied to vegetation mapping within this holding.	Land access restrictions inhibited all targeted threatened flora survey effort within this holding, and the guide has been applied to candidate flora species assumed present within this holding.	Land access restrictions inhibited all targeted threatened fauna survey effort within this holding, and the guide has been applied to candidate fauna species assumed present within this holding.
286	16.8	0.28%	Murray Fans	Land access restrictions inhibited all ecology survey effort within this holding. Where possible, survey effort was undertaken via other private land holdings where access was permitted. However, survey information was extremely limited, and the guide has been applied to vegetation mapping.	Land access restrictions inhibited all ecology survey effort within this holding, and the guide has been applied to candidate flora species assumed present within this holding.	Land access restrictions inhibited all ecology survey effort within this holding, and the guide has been applied to candidate fauna species assumed present within this holding.
287	34.4	0.57%	Murray Fans	Land access restrictions inhibited all ecology survey effort within this holding. Where possible, survey effort was undertaken via other private land holdings where access was permitted. However, survey information was extremely limited, and the guide has been applied to vegetation mapping.	Land access restrictions inhibited all ecology survey effort within this holding, and the guide has been applied to candidate flora species assumed present within this holding.	Land access restrictions inhibited all ecology survey effort within this holding, and the guide has been applied to candidate fauna species assumed present within this holding.

Holding #	Area (ha)	% of the amended project footprint	IBRA Sub-region	Justification for inclusion in application of the guide		
				Vegetation mapping	Candidate threatened flora species	Candidate threatened fauna species
307	260.7	4.30%	Murray Fans	Land access was granted for a brief period in early 2025 that allowed for flora survey effort in the form of: — vegetation mapping — BAM VI plots and — assessment of scattered trees. As such, the guide has not been applied to vegetation mapping or scattered trees within this holding.	Land access was granted for a brief period in early 2025 that allowed for limited threatened flora species survey effort, which was restricted to one species being, *Eucalyptus leucoxylon* subsp. *pruinosa.* During all other periods, land access was withheld, and the guide has been applied to all other candidate threatened flora species.	Land access was granted for a brief period in early 2025 that allowed for fauna survey effort in the form of: — hollow bearing tree survey effort — nocturnal spotlighting for Koalas and Grey Snake — call playback for Southern Bell Frog and — habitat assessments for Squirrel Gliders and Brush-tailed Phascogale. The guide has been applied to remaining candidate fauna species assumed present within this holding.
366	484.9	8.01%	Murrumbidgee	Land access restrictions inhibited all ecology survey effort within this holding. Where possible, survey effort was undertaken via public land and other private land holdings where access was permitted. However, survey information was extremely limited, and the guide has been applied to vegetation mapping.	Land access restrictions inhibited all ecology survey effort within this holding, and the guide has been applied to candidate flora species assumed present within this holding.	Land access restrictions inhibited all ecology survey effort within this holding, and the guide has been applied to candidate fauna species assumed present within this holding.



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VNI West – BDAR

Figure P2.1
Restricted access holdings

Legend

- Rail line
- Main road
- Named waterway
- Existing transmission line
- Approved Project EnergyConnect
- Ameneded project footprint
- Subject land
- Property with restricted access
- Assumed habitat in restricted access holding

Area subject to Surrogate survey

IBRA Subregion
- Murray Fans
- Murrumbidgee

Data sources: NSW EPI, DELWP, WSP, EnergyConnect

P2.1 Suitable surrogate sites

Section 3.2.1 of the guide outlines parameters in which the assessor must use to identify suitable surrogate sites. As the basis of application of the guide, suitable surrogate sites were identified and include lands that:

- are directly adjacent to and/or within reasonable distance to the restricted-access holdings which generally included all patches of suitably surveyed vegetation within the amended project footprint
- are restricted to the appropriate IBRA sub-region associated with each restricted-access holding
- are likely to contain the same plant community type in the same broad condition state
- have a similar land-use history, and
- are considered to have the same or similar soil type, landscape position and mean annual rainfall.

Where surrogate sites were identified for threatened species survey, additional considerations outlined in section 3.2.2 of the guide were applied and include:

- an assessment of patch size and habitat connectivity between potential suitable habitats within the restricted-access holding and identified suitable habitat within the surrogate site
- any habitat constraints and geographic limitations relevant to the candidate species, and
- the homogeneousness of the landscape.

For the application of the guide to the amended project, all areas within the amended project footprint that fall outside the identified restricted-access holdings have been assessed as part of the surrogate sites. However, the use of surrogate sites has been limited to holdings within the same IBRA subregions, meaning that survey effort undertaken within a surrogate site in the Murrumbidgee IBRA subregion has not been applied to restricted-access holdings within the Murray Fans IBRA subregion.

Within the Murrumbidgee IBRA subregion, the maximum distance between a restricted-access holding and a surrogate site is approximately 130 km. The guide states that the surrogate sites must be directly/adjacent to and/or within a reasonable distance to the restricted-access holding. While the physical maximum distance between the restricted-access holding and the furthest surrogate site is large, the general homogeneousness of landscape and habitat features across the Hay Plain means that survey effort undertaken for candidate species across the entire amended project footprint should be applicable to the restricted-access holdings given that both areas contain vegetation assigned to the same PCT and condition class. Candidate species that have not been applied to the entire amended project footprint due to habitat or geographic constraints have been given additional considerations where species have been removed from consideration if suitable surrogate sites within the species constraints do not exist. Further details about the application of surrogate sites to each threatened flora species is provided below in section P4.

All surrogate sites within the Murray Fans IBRA subregion fall within a relatively reasonable distance to the restricted-access holdings and are considered suitable for application under the guide.

Furthermore, additional assessment of characteristics for surrogate sites and restricted-access holdings considered in this memo are provided below in section P4.

P2.2 Characteristics of the restricted-access holdings and surrogate sites proposed for application of the guide

Biotic and abiotic characteristics were considered to ensure that surrogate sites provide accurate representations of the restricted-access holdings. An assessment of these factors is provided below in section P2.2.1–P2.2.6.

P2.2.1 Native vegetation and broad condition states

Native vegetation and broad condition states within the surrogate sites have been assessed during field verification survey effort undertaken for the drafting of the amendment BDAR, and within the restricted-access holdings where limited access has been available including surveys undertaken from public lands and neighbouring holdings with approved land access agreements. Several restricted-access holdings have been mapped in their entirety during field verification surveys due to a brief period of approved access, and one additional holding has been mapped in its entirety from publicly accessible land.

Vegetation was found to consist of several vegetation types including Acacia shrublands, pine woodlands, chenopod shrublands, natural grasslands, Black Box woodlands and River Red Gum forests. The condition of these vegetation types varied but were generally consistent throughout the amended project footprint, where:

- Acacia shrublands dominated by either *Acacia pendula* or *Acacia melvillei* were recorded in various broad condition states ranging from intact vegetation in moderate-good condition to vegetation in a stable derived native grassland condition. Acacia shrublands are generally restricted to the Murrumbidgee IBRA subregion.
- Pine woodlands dominated by either *Callitris glaucophylla* and/or *Callitris gracilis* subsp. *murrayensis* where generally recorded to be in a thinned or derived native grassland or derived native tall shrubland condition. Vegetation was generally degraded within these communities, and no intact patches were recorded within the surrogate sites. Pine woodlands were identified within both the Murrumbidgee and Murray Fans IBRA subregion.
- Chenopod shrublands were the most commonly recorded vegetation type within the amended project footprint and were consistently recorded to be in moderate-good condition.
- Several types of natural grasslands were identified within surrogate sites located on the eastern side of the amended project footprint. All associated vegetation was determined to be in moderate-good condition.
- Extensive Black Box woodlands were identified within surrogate sites within the Murrumbidgee and Murray Fans IBRA subregion and included intact vegetation in moderate-good condition and vegetation occurring in a stable derived natural grassland condition.
- Patches of River Red Gum Forest were identified along waterways in the Murray Fans and Murrumbidgee IBRA subregion in moderate-good condition.

Further discussion about native vegetation types and broad condition states within the surrogate sites and restricted-access holdings is provided below in section P3. Extensive details of native vegetation within the amended project footprint, and therefore the surrogate sites, is provided in section 4 of the BDAR.

P2.2.2 Land-use history

Land-use history within the amended project footprint was consistent across the surrogate sites within each subregion, where:

- Within the Murrumbidgee IBRA subregion, most land within the amended project footprint was subject to agricultural practices including the grazing of livestock. Areas of intensive agriculture (i.e. cropping) were limited. Historic land-use practices has led to the degradation of all vegetation types identified within this subregion with a marked reduction in canopy cover where Acacia shrublands, pine woodlands and Black Box woodlands have been identified.

- Within the Murray Fans IBRA subregion, most land within the amended project footprint was subject to agricultural practices including the grazing of livestock and areas of intensive agriculture. There is a general degradation of vegetation where agricultural practices have been limited to the grazing of livestock, with noted areas of reduced canopy, mid and ground cover due to overgrazing on some holdings. Extensive areas of intensive agriculture in the form of cropping have been identified within this subregion. Areas subject to historic cropping practices have been found to generally be recolonised with native species, while areas subject to active cropping are considered to hold no biodiversity values and have been excluded from the application of the guide.

Further discussion of land-use history in relation to the surrogate sites and application to restricted-access holdings is provided in section P3.2. Extensive details about land-use history and its impacts to vegetation within the amended project footprint, and therefore the surrogate sites, is provided in section 4.1 of the BDAR.

P2.2.3 NSW (Mitchell) Landscapes

NSW (Mitchell) landscapes are a broad scale land classification system based on geology, geomorphology and soil to identify ecological characteristics where vegetation occurring on the same NSW Mitchell landscape is considered to share similar characteristic features. A summary of the NSW (Mitchell) landscapes within the amended project footprint and surrogate sites for each IBRA subregion is provided in Table P2.2 and Figure P2.2.

Table P2.2 Mitchel landscape summary

IBRA subregion	Holding number	Mitchell landscape	Area within amended project footprint of the restricted property (ha)	Area within surrogate sites (ha)
Murrumbidgee	201	Murrumbidgee Scalded Plains	38.66	2464.04
	366	Murrumbidgee Scalded Plains	242.18	2463.95
		Murrumbidgee Depression Plains	243.17	38.91
Murray Fans	208	Murray Channels and Floodplains	54.03	692.34
	219	Murray Scalded Plains	63.27	32.32
		Mallee Cliffs Sandplains	1.33	67.54
	281	Murray Channels and Floodplains	37.45	692.34
	286	Murray Channels and Floodplains	2.22	692.34
		Murray Depression Plains	14.54	0.00
	287	Murray Channels and Floodplains	24.15	692.34
		Murray Depression Plains	10.23	0.00
	307	Murray Channels and Floodplains	243.48	692.34
		Murray Depression Plains	17.20	0.00

P2.2.4 Soil morphology

Soil morphology has been utilised to determine the suitability of surrogate sites given vegetation types within the Hay Plain are predominantly determined by the underlying soil type. A summary of the soil morphologies within the amended project footprint within restricted-access properties was determined using the Australian Soil Classification (ASC) soil type map for NSW and is presented in Table P2.3 and Figure P2.3.

Table P2.3 Soil morphology summary

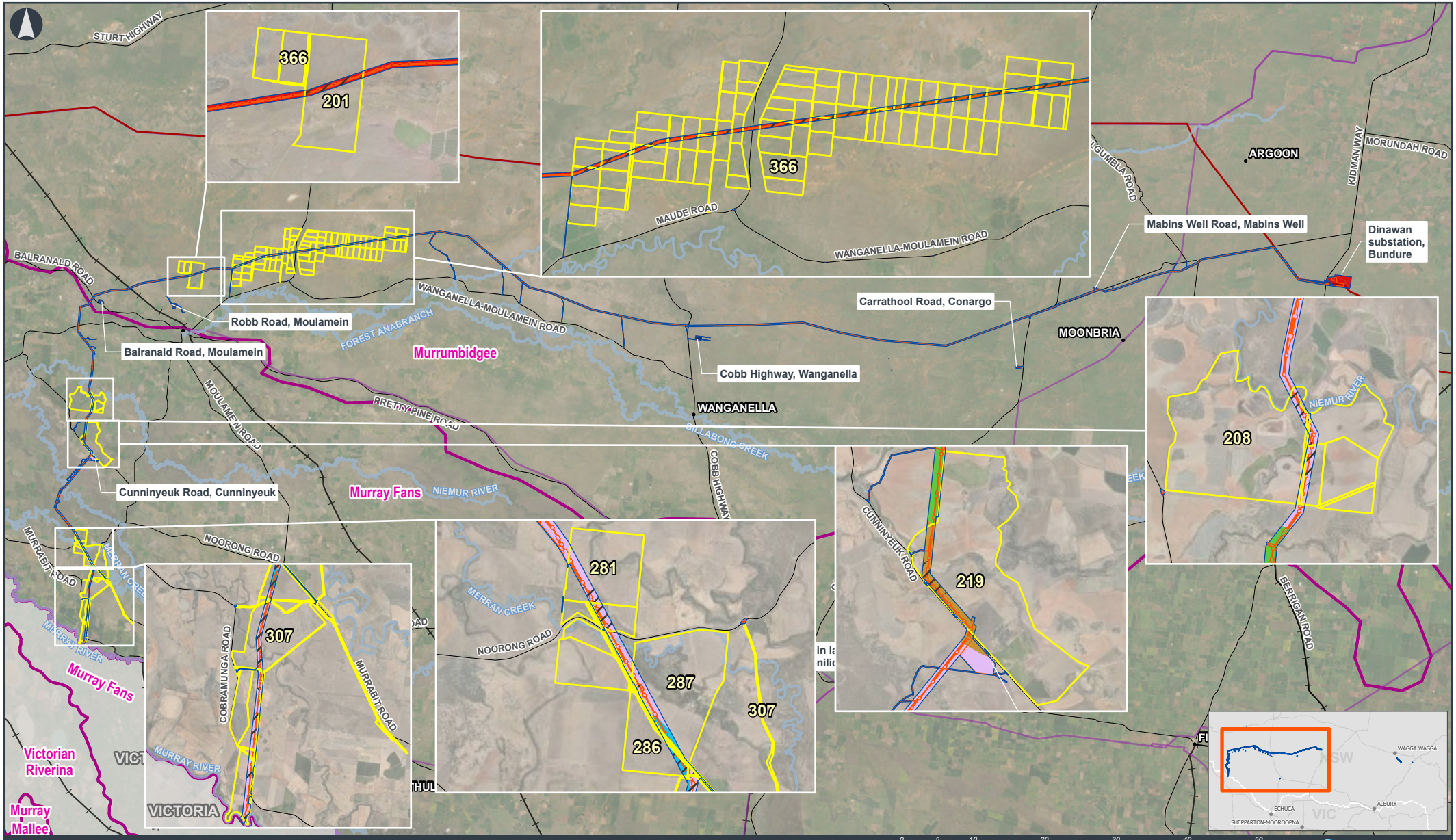
IBRA subregion	Holding number	ASC order	Area within the amended project footprint of the restricted property (ha)	Area within surrogate sites (ha)
Murrumbidgee	201	Vertosols	38.66	3625.52
	366	Rudosols	64.04	318.89
		Vertosols	421.32	3625.52
Murray Fans	208	Vertosols	54.03	771.28
	219	Vertosols	64.60	771.28
	281	Vertosols	37.45	771.28
	286	Vertosols	16.76	771.28
	287	Vertosols	34.38	771.28
	307	Rudosols	18.52	26.08
		Vertosols	241.83	771.28

P2.2.5 Landscape position

The surrogate sites and remote access holdings traverse several landscape features including aeolian sand dunes and alluvial plains and channels. Given the Hay Plains characteristic lack of elevation, these features are generally limited to minor changes including differences of less than one meter. A desktop review of the surrogate sites and subsequent comparison to likely landscape features within the remote access holdings was undertaken as part of the application of the guide, where Mitchell landscapes, ASC soil type, site hydrology including mapped hydrolines and aerial imagery was utilised to determine the likely landscape position within each site. This desktop review determined that there was adequate vegetation that shared similar landscape positions to the restricted-access holdings to adequately apply WSP desktop-based vegetation mapping. Additional information regarding landscape position of each desktop mapped restricted-access holding is provided below in section P3.

P2.2.6 Mean annual rainfall

The Riverina IBRA bioregion, which includes the Murrumbidgee and Murray Fans IBRA subregions, is considered to be semi-arid winter-dominated rainfall area with an east-west rainfall gradient where higher rainfall averages are experienced in the south-east and lower rainfall averages in the north-west of the region. A review of 30-year averages for sites in the east (Deniliquin – weather station 074258) and west (Swan Hill – weather station 077094) of the amended project footprint has indicated the rainfall gradient of approximately 60 mm per annum (BOM, 2026). However, the surrogate sites and restricted-access holdings are still considered to have similar mean annual rainfall.



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VNI West – BDAR

Figure P2.2
Mitchell Landscapes map within the restricted access holdings

Legend

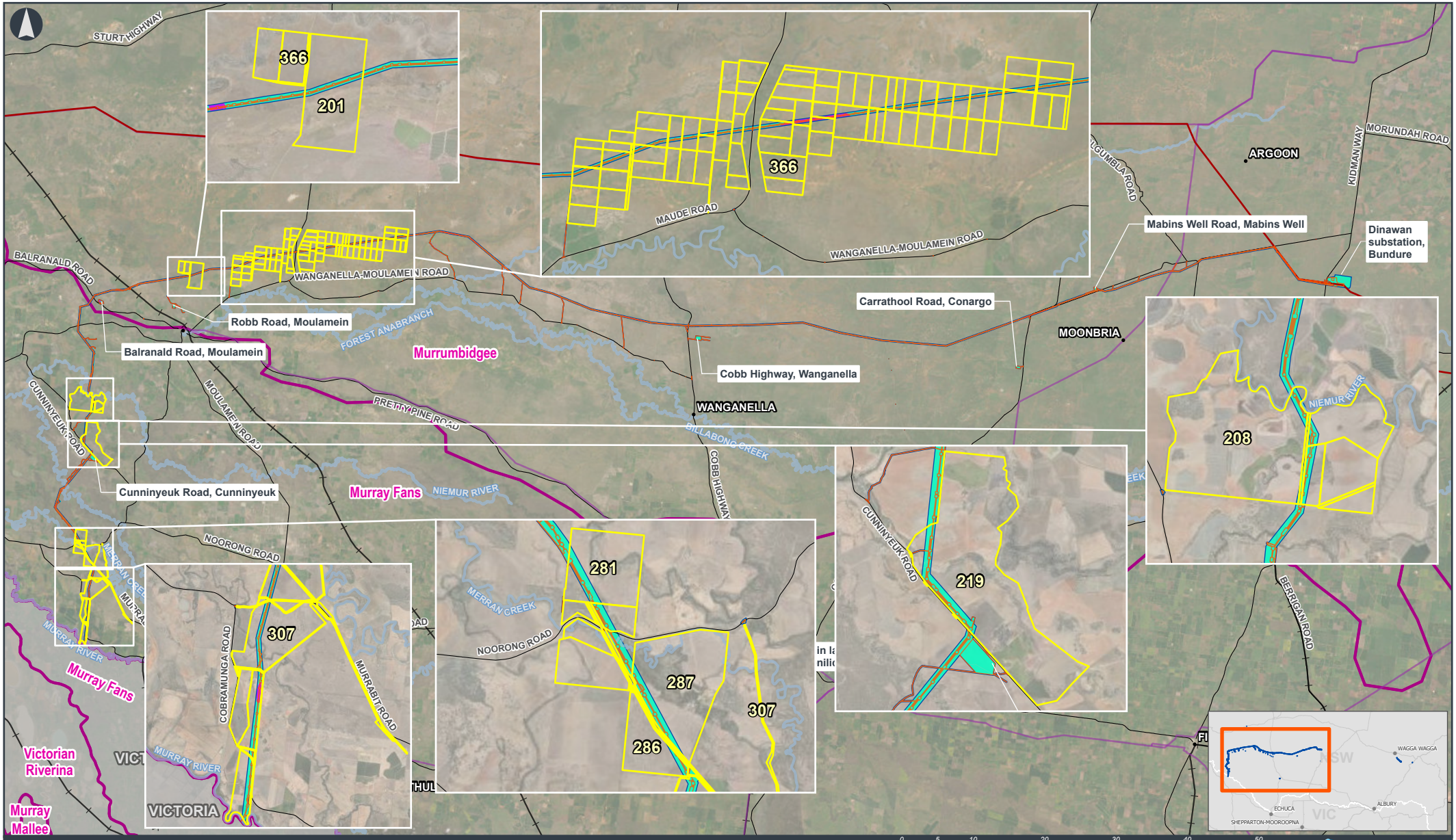
- Rail line
- Main road
- Existing transmission line
- Approved Project EnergyConnect
- Subject land
- Ameneded project footprint
- IBRA Subegion
- Property with restricted access
- Assumed habitat in restricted access holding

Mitchell Landscapes

- Mallee Cliffs Sandplains
- Murray Channels and Floodplains
- Murray Depression Plains
- Murray Scalded Plains
- Murray Source-bordering Dunes
- Murrumbidgee Channels and Floodplains
- Murrumbidgee Depression Plains
- Murrumbidgee Scalded Plains
- Murrumbidgee Source-bordering Dunes

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Data sources: NSW EPI, DELWP, WSP, EnergyConnect



VNI West – BDAR

Figure P2.3
Australian Soil Classification (ASC) soil type map within the restricted access holdings

Legend

- Rail line
- Main road
- Named waterway
- Existing transmission line
- Approved Project EnergyConnect
- Amended project footprint
- Subject land
- Property with restricted access
- IBRA Subegion

ASC Soil Type

- Calcarosols (CA)
- Chromosols (CH)
- Rudosols (RU)
- Vertosols (VE)
- Water

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Data sources: NSW EPI, DELWP, WSP, EnergyConnect

P3. Assessing native vegetation, vegetation integrity and threatened ecological communities

P3.1 Desktop assessment

Section 4.1 of the guide outlines methodology where surrogate sites can be utilised to assess native vegetation within areas of remote assessment. As such, in areas of restricted-access, the following information has been utilised in determining the vegetation extent and condition likely to be present in the subject land:

- NSW State Vegetation Type Map release C2.0M2.1 (accessed July 2025) (NSW DCCEEW, 2020)
- aerial imagery provided on the ArcGIS online World Imagery map server (accessed July 2025) (ESRI, 2025) and on Google Earth Pro (accessed July 2025) (Google Earth Pro, 2025)
- historic imagery provided on NSW Government Historic Imagery Search and Discovery spatial viewer (NSW SS, 2025)
- draft Native Vegetation Regulatory (NVR) mapping (NSW OEH, 2024)
- Australian Soil Classification (ASC) Soil Type map (DPIE, 2021)
- NSW (Mitchell) Landscapes (NSW DCCEEW, 2016)
- Hydro line and Hydro areas identified in Six maps clip and ship package (NSW SS, 2025a) (NSW SS 2025b) (NSW ss 2025c)
- field verified vegetation from surrogate sites within the Murray fans and Murrumbidgee IBRA sub-region
- field verification surveys undertaken from roadsides limited to areas that could be mapped accurately by visual survey and applying the rapid point assessment method
- vegetation integrity plot data acquired in areas of surrogate land within the project subject land to determine the Plant Community Type and vegetation condition state.

P3.1.1 Size of the surrogate land and restricted-access holdings within the amended project footprint

A comparison of the total size of the surrogate land and the extent of each restricted-access holdings within the amended project footprint was completed to ensure suitable survey effort within surrogate lands was undertaken. A comparison of each area of restricted-access and the applicable surrogate sites is provided below in Table P3.1.

Table P3.1 Comparison of restricted-access holdings against areas of surrogacy

IBRA subregion	Restricted-access holding	Area (ha) – restricted-access holdings	Area (ha) – surrogate sites
Murrumbidgee	H201[1]	38.09	3817.58
	H366	482.73	
Murray Fans	H208	36.64	644.17
	H219	20.72	
	H281	22.43	
	H286	16.19	
	H287	5.24	
	H307[1]	167.02	

1. Holdings subject to select periods of access that allowed WSP field verification of vegetation mapping to occur.

P3.2 Vegetation mapping

P3.2.1 PCT overview

Based on the above assessment of vegetation within the restricted-access holdings and surrogate sites, vegetation mapping has been applied by WSP for all restricted-access holdings where PCT and broad condition states have been identified. Survey effort methods undertaken within the surrogate sites to inform the vegetation mapping is provided in section 2.2 of the BDAR with overall survey effort shown on BDAR Figure 15.7, and survey results within the surrogate sites provided in BDAR section 4 and BDAR figure 15.8. BAM VI plot survey effort required for each vegetation zone within the restricted-access holdings and the applied BAM VI plots is provided in Appendix A of this memo while the outcomes of this assessment are summarised in Table P3.2 and Figure P3.1 below. As the BAM-C cases for the project were already drafted at the time the guide was published, no additional BAM-C cases were created to show specific impacts for the restricted-access holdings, including the impacts to native vegetation. Instead, impacts have been presented as part of the overarching BAM-C case for each respective IBRA subregion.

Table P3.2 Plant Community Types present within the subject land for the restricted-access holdings and surrogate sites

IBRA subregion	Holding	PCT	Condition class	Area (ha) - restricted-access holdings	Area (ha) - surrogate sites	VI score
Murrumbidgee	H201 (WSP field verified)	PCT 23 – Yarran tall open shrubland of the sandplains and plains of the semi-arid (warm) and arid climate zones	Derived	1.42	29.47	33.2
		PCT 157 – Bladder Saltbush shrubland on alluvial plains in the semi-arid (warm) zone including Riverina Bioregion	Moderate-good	0.22	412.38	90
		PCT 160 – Nitre Goosefoot shrubland wetland on clays of the inland floodplains	Moderate-good	0.49	84.44	88.7
		PCT 163 – Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones	Moderate-good	35.79	222.29	97.7
		PCT 164 – Cotton Bush open shrubland of the semi-arid (warm) zone	Moderate-good	0.17	978.46	86.9
	H366	PCT 15 – Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Moderate-good	0.23	168.36	70.6
		PCT 17 – Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Moderate-good	12.29	39.20	84.7
		PCT 46 – Curly Windmill Grass – spear grass – wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion	Moderate-good	70.25	199.49	91.4
		PCT 157 – Bladder Saltbush shrubland on alluvial plains in the semi-arid (warm) zone including Riverina Bioregion	Moderate-good	19.55	412.38	90

IBRA subregion	Holding	PCT	Condition class	Area (ha) - restricted-access holdings	Area (ha) - surrogate sites	VI score
		PCT 160 – Nitre Goosefoot shrubland wetland on clays of the inland floodplains	Moderate-good	9.04	84.44	88.7
		PCT 163 – Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones	Moderate-good	1.64	222.29	97.7
		PCT 164 – Cotton Bush open shrubland of the semi-arid (warm) zone	Moderate-good	368.98	978.46	86.9
		PCT 166 – Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW	Moderate-good	0.33	0.00	100
Murray Fans	H208	PCT 10 – River Red Gum – Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Thinned	1.85	37.18	33.5
		PCT 13 – Black Box – Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Derived – No Offset	4.20	180.45	12.6
			Moderate-good	30.59	177.77	56.2
	H219	PCT 13 – Black Box – Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Derived – No Offset	17.22	180.45	12.6
			Moderate-good	3.27	177.77	56.2
		PCT 163 – Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones	Moderate-good	0.23	71.97	83.2
	H281	PCT 10 – River Red Gum – Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Thinned	1.66	37.18	33.5
		PCT 13 – Black Box – Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Derived – No Offset	0.06	180.45	12.6
			Moderate-good	20.72	177.77	56.2
	H286	PCT 13 – Black Box – Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Derived – No Offset	4.53	180.45	12.6
			Moderate-good	8.17	177.77	56.2
		PCT 28 – White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone	Derived	3.47	0.82	6.1

IBRA subregion	Holding	PCT	Condition class	Area (ha) - restricted-access holdings	Area (ha) - surrogate sites	VI score
		PCT 216 – Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion	Moderate-good	0.02	2.57	75.3
	H287	PCT 7 River Red Gum – Warrego Grass – herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion	Moderate-good	0.05	10.03	74.7
		PCT 10 – River Red Gum – Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Thinned	1.49	37.18	33.5
		PCT 13 – Black Box – Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Derived – No Offset	1.92	180.45	12.6
			Moderate-good	1.78	177.77	56.2
	H307 (WSP field verified)	PCT 7 – River Red Gum – Warrego Grass – herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion	Moderate-good	3.24	10.03	74.7
		PCT 10 – River Red Gum – Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Derived – No Offset	60.40	12.27	4.7
			Thinned	26.55	37.18	33.5
		PCT 13 – Black Box – Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Derived – No Offset	56.07	180.45	12.6
			Moderate-good	16.89	177.77	56.2
		PCT 28 – White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone	Derived	2.36	0.82	6.1
			Derived – Tall Shrubland	1.52	0.68	37.5

1. No survey effort for this PCT and condition class has been undertaken within the surrogate sites. Vegetation has been assumed to meet benchmark condition. Further detailed provided in section 4.5 of the BDAR.

P3.2.2 Holding 201

Land access for this holding was granted for a brief period in early 2025. During this time vegetation mapping was completed during field verification survey effort. As such, the guide was not be applied to vegetation mapping within this holding. WSP verified vegetation mapping within this holding is provided on Figure P3.1 with vegetation integrity outcomes discussed in section P3.3 and Appendix A. Additional information regarding WSP field verified vegetation mapping is presented in section 2.2 and Chapter 4 of the BDAR.

P3.2.3 Holding 208

This restricted-access holding is within the Murray Fans IBRA subregion and forms part of a broad alluvial floodplain complex dominated by *Eucalyptus largiflorens* (Black Box) woodlands. Current world imagery provided on Arc GIS online (ESRI, 2025) and Google Earth Pro (2025) identify the holding to be a mixture of remnant woodland and cleared intensive agricultural areas. Table P3.3 provides and analysis of available data sources used during desktop vegetation mapping.

Table P3.3 Summary of information used to determine desktop vegetation mapping on holding 208

Attribute	Discussion
Mitchell Landscape	Murray Channels and Floodplains are shown on Figure P2.2.
ASC soil type	The entire holding has been identified as Vertosols. Soil type is provided on Figure P2.3.
Hydrology	An ephemeral channel runs north-south through the centre of the holding which would likely fill in times of higher rainfall. The Niemur River runs east-west in the north section of the holding. Multiple irrigation channels of various sizes run throughout the western side of the holding but would not impact vegetation within the subject land. Site hydrology is provided on Figure P3.1.
SVTM within the subject land	PCT 2, 10, 13 and 44. Vegetation mapping based on SVTM is provided in Figure P3.1.
Category 1 lands within the subject land	**NVR map** Two areas of potential Category 1 lands identified in the NVR map which have been identified on Figure P3.1.
	Historic imagery Historic imagery identifies land clearing occurred prior to 1991. Evidence provided in Photo P3.1.
	Confirmed in current imagery or field verification survey Current aerial imagery from multiple data sources identifies two areas of intensive agriculture (i.e. cropping) in the south and east of the restricted-access holding. Field verification surveys undertaken from publicly accessible areas has identified recent cropping has occurred in the south of the restricted-access holding. Photographic evidence is provided on Photo P3.2.
Furthest point from WSP survey	WSP field verification surveys have been undertaken directly north and south of the restricted-access holding. The longest distance from WSP field verification survey within the holding is approximately 1.5 km. BAM VI plots applicable to this holding have been outlined in Appendix A.

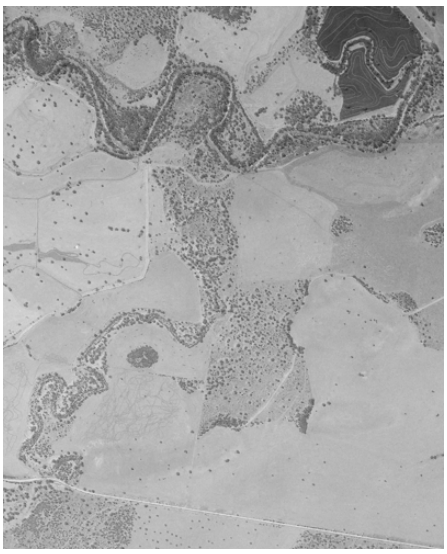


Photo P3.1 1991 historic imagery



Photo P3.2 Evidence of intensive agriculture

Areas where vegetation mapping could be completed from public land or private land with access agreements have been field verified. Polygons that have been field verified and form contiguous patches with vegetation subject to access restrictions have been expanded to include the entirety of the patch including areas of Category 1 lands where clear evidence of cropping is available in the form of current and historic aerial imagery.

Vegetation extrapolation is required for a large portion of this site due to limited areas of accessibility. In the south of the site, Category 1 lands and polygons of PCT 13 are extended throughout given the clear similarity of aerial imagery to field verified vegetation. In the centre of the site, vegetation is assumed to meet the characteristic requirements of PCT 13 due to the similarities between landscape position and soil type, that being vegetation forms part of a large alluvial plain that would be subject to inundation during times of higher-than-average flows (including times of dry floods from up-stream inputs) on heavy grey clays, with surrogate sites within the Murray Fans IBRA region. This includes surrogate sites that are directly north and south of the restricted-access holding. The assignment of this PCT is also supported by the SVTM which applies PCT 13 to these patches. In the north of the site, where vegetation lines the banks of the Niemur River, there is a high likelihood of the presence of *Eucalyptus camaldulensis* based on vegetation field verified on surrogate sites in similar landscape position and proximity to watercourses. Given this and that PCT 10 has been identified by SVTM to be present on the northern side of the river during field verification of the surrogate sites, vegetation on the bank of the Niemur River has been assigned to PCT 10. This includes areas where canopy size and density on aerial imagery is slightly different to broader floodplain vegetation which is a characteristic of *Eucalyptus camaldulensis*. All native vegetation within this holding is assumed to be in moderate-good condition.

Within areas identified as Category 1 lands by the draft NVR mapping, where canopy species have been identified in aerial imagery and meet the definition of a ‘patch’ as defined by the BAM, vegetation has been assumed to be PCT 13 given prevalence of this community throughout the region and surrogate sites. Vegetation condition has been assumed to meet moderate-good condition class as the guide specifies that vegetation is assumed to not be degraded, however, this is generally considered to be an overestimate of vegetation integrity. Where canopy species have been identified in areas of Category 1 lands subject to access restrictions and do not meet the requirement of ‘patch’ as defined by BAM the scattered tree module has been applied with all individuals being assumed as *Eucalyptus largiflorens* that meet the class 3 requirements and contain hollows.

A summary of vegetation mapping undertaken through desktop assessment is provided in Figure P3.1.

P3.2.4 Holding 219

This restricted-access holding is within the Murray Fans IBRA subregion and forms part of a broad alluvial floodplain complex dominated by *Eucalyptus largiflorens* (Black Box) woodlands. Current world imagery provided on Arc GIS online (ESRI, 2025) and Google Earth Pro (2025) identify the holding to be a mixture of remnant woodland, derived native grasslands and cleared intensive agricultural areas. Table P3.4 provides and analysis of available data sources used during desktop vegetation mapping.

Table P3.4 Summary of information used to determine desktop vegetation mapping on holding 219

Attribute	Discussion
Mitchell Landscape	Murray Scalded Plains and Mallee Cliffs Sandplains is provided on Figure P2.2.
ASC soil type	The entire holding has been identified as Vertosols. Soil type is provided on Figure P2.3.
Hydrology	Several ephemeral waterways have been identified within the holding, including a small ephemeral channel in the southwest of the site that is unlikely to have natural flow due to land use history and Magpie Creek in the northeast. Magpie Creek is considered to have a semi-natural flow and has been identified by field verification survey to support Black Box woodlands. Site hydrology is provided on Figure P3.1.
SVTM within the subject land	PCT 0, 13, 15, 19 and 44. Vegetation mapping based on SVTM is provided in Figure P3.1.
Category 1 lands within the subject land	**NVR map** Two areas of potential Category 1 lands identified in the NVR map which have been identified on Figure P3.1.
	Historic imagery Historic imagery from 1976 supports the draft NVR map. Evidence provided in Photo P3.3.
	Confirmed in current imagery or field verification survey Current aerial imagery from multiple data sources identifies two areas of intensive agriculture (i.e. cropping) in the south and north of the restricted-access holding. Field verification surveys undertaken from publicly accessible areas has identified recent cropping has occurred in the south of the restricted-access holding. Photographic evidence is provided on Photo P3.4.
Furthest point from WSP survey	WSP field verification surveys have been undertaken along Cunninyeuk road which runs parallel to the holding along the southern border of the site. Additional field verification has occurred on private land subject to an access agreement directly north of the site. The longest distance from WSP field verification survey within the holding is approximately 700 m. BAM VI plots applicable to this holding have been outlined in Appendix A.

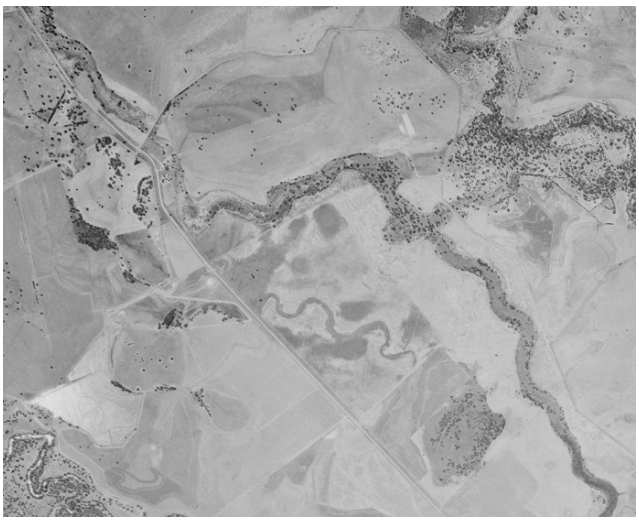


Photo P3.3 1976 historic imagery



Photo P3.4 Evidence of intensive agriculture

Where the site runs parallel to Cunninyeuk Road vegetation mapping was undertaken from publicly accessible lands (i.e. roadside). Native vegetation is largely comprised of derived native grasslands with occasional patches of remnant canopy limited to *Eucalyptus largiflorens* (Black Box). As such, PCT 13 has been applied to this area as it shares a similar landscape position, soil type and characteristic species composition as surrounding vegetation on surrogate sites in that it occurs as part of a large alluvial plain on heavy grey clays that is semi-regularly inundated and contains *Duma florulenta* (Lignum) in the understorey. The application of PCT 13 in derived condition throughout this area varies from the SVTM application of PCT 44 which is considered to not meet the characteristics of this site as described previously. Furthermore, the application of PCT 44 throughout this area by SVTM is generally considered a misapplication of this PCT and vegetation is more likely to be derived from woodland vegetation, which is extensive in the region and common on surrogate sites within the Murray Fans IBRA subregion, rather than naturally treeless as historic logging and land clearing is common in this area.

Vegetation associated with Magpie Creek where the creek intersects Cunninyeuk road was identified to be PCT 13 in moderate-good condition. Where vegetation is contiguous, vegetation mapping of PCT 13 has been extended into areas not subject to field verification due to access restrictions. The application of PCT 13 varies from the SVTM application of PCT 15. PCT 13 is considered more suitable for vegetation in this area due to the dominance of PCT 13 within surrogate sites and presence of *Duma florulenta* (Lignum) in the understorey at roadside locations.

The holding also has large areas of cleared land that are considered to meet the definition of Category 1 lands. Along Cunninyeuk Road areas of Category 1 lands have been identified and supported through photographic evidence collected as part of rapid flora survey points, current aerial imagery and historic imagery. Where field verification surveys could not be undertaken due to land access restrictions, Category 1 lands have been identified using current and historical imagery and through the use of surrogate sites where Category 1 lands have been field verified in close proximity and evidence of cropping is contiguous into areas not subject to survey. Category 1 lands in the restricted-access holding is also supported by SVTM application of PCT 0. Where canopy species have been retained in areas of Category 1 lands subject to access restrictions, ‘patches’ have been identified to most likely align with PCT 13 based on surrogate sites within the area. Vegetation condition has been assumed to meet moderate-good condition class as the guide specifies that vegetation is assumed to not be degraded, however, this is generally considered to be an overestimate of vegetation integrity. Where canopy species have been identified in areas of Category 1 lands subject to access restrictions and do not meet the requirement of ‘patch’ as defined by BAM the scattered tree module has been applied with all individuals being assumed as *Eucalyptus largiflorens* that meet the class 3 requirements and contain hollows.

A summary of vegetation mapping undertaken through desktop assessment is provided in Figure P3.1.

P3.2.5 Holding 281

WSP field verified vegetation mapping for this holding was undertaken from adjoining public land and private land holdings where access was permitted for the entirety of impacted land within this holding. As such, the guide was not applied to vegetation mapping within this holding. WSP verified vegetation mapping within this holding is provided on Figure P3.1 with vegetation integrity outcomes discussed in section P3.3 and Appendix A. Additional information regarding WSP field verified vegetation mapping is presented in section 2.2 and Chapter 4 of the BDAR.

P3.2.6 Holding 286

This restricted-access holding is within the Murray Fans IBRA subregion and vegetation is generally homogenous with surrounding surrogate sites in that the area forms a large floodplain woodland typically dominated by *Eucalyptus largiflorens* which grades into *Eucalyptus camaldulensis* closer to water courses/areas subject to more regular inundation. Several small remnant source-bordering sandhills remain but are largely degraded and generally lack canopy species. Current world imagery provided on Arc GIS online (ESRI, 2025) and Google Earth Pro (2025) identify the holding to be a mixture of remnant woodland, derived native grasslands and cleared intensive agricultural areas. Table P3.5 provides and analysis of available data sources used during desktop vegetation mapping.

Table P3.5 Summary of information used to determine desktop vegetation mapping on holding 286

Attribute	Discussion
Mitchell Landscape	Murray Channels and Floodplains and Murray Depression Plains are provided on Figure P2.2.
ASC soil type	The entire holding has been identified as Vertosols. Soil type is provided on Figure P2.3.
Hydrology	None present within this holding.
SVTM within the subject land	PCT 0, 13, 15, 19, 44 and 163. Vegetation mapping based on SVTM is provided in Figure P3.1.
Category 1 lands within the subject land	**NVR map** None present within this holding
	Historic imagery Not reviewed. No evidence of intensive agriculture.
	Confirmed in current imagery or field verification survey No evidence of intensive agriculture.
Furthest point from WSP survey	WSP field verification surveys have been undertaken on private land subject to an access agreement south of the restricted-access holding. The longest distance from WSP field verification survey within the holding is approximately one km. BAM VI plots applicable to this holding have been outlined in Appendix A.

Most vegetation within the holding has been assigned to PCT 13 which was identified to be the dominant vegetation type on the surrogate site to the south of the restricted-access holding. PCT 13 identified within the restricted-access holding was assigned to moderate-good condition and vegetation is assumed to be intact except where aerial imagery clearly shows the removal of canopy species. Where aerial imagery shows canopy removal vegetation has been assigned to derived condition. Areas where PCT 13 have been applied vary from SVTM application of PCT 15, 163 and 44. PCT 13 is generally considered to be the dominant vegetation community within surrogate sites in this area and is likely a better fit than PCT 15. PCT 163 and PCT 44 have generally only been applied by SVTM in areas where WSP extrapolated mapping has identified derived condition vegetation. Given the dominance of woodland vegetation throughout the region and surrogate sites, areas lacking canopy species are more likely derived from woodland communities than naturally treeless as historic logging and land clearing is common in this area.

There was one instance within the restricted-access holding where SVTM indicated PCT 19. Within this area there is evidence, based on aerial imagery, of a potential low sandhill which shows the correct colouration typical of sandhills in this region, including evidence of redder soils where overgrazing / degradation has occurred and soil can be clearly seen. Within the broader region, areas similar to this within the surrogate sites have been assigned to PCT 28 due to their landscape position, soil type and associated characteristic species. As such, vegetation within this area of the restricted-access holding has been assigned to PCT 28. Lastly, the area appears to be subject to historic clearing and continued grazing pressures that have resulted in vegetation taking the form of a derived natural grassland. As such, vegetation has been assigned to derived condition class.

A summary of vegetation mapping undertaken through desktop assessment is provided in Figure P3.1.

P3.2.7 Holding 287

This restricted-access holding is within the Murray Fans IBRA subregion and vegetation is generally homogenous with surrounding surrogate sites in that the area forms a large floodplain woodland typically dominated by *Eucalyptus largiflorens* which grades into *Eucalyptus camaldulensis* closer to water courses/areas subject to more regular inundation. Current world imagery provided on Arc GIS online (ESRI, 2025) and Google Earth Pro (2025) identify the holding to be a mixture of remnant woodland, derived native grasslands and cleared intensive agricultural areas. Table P3.6 provides and analysis of available data sources used during desktop vegetation mapping.

Table P3.6 Summary of information used to determine desktop vegetation mapping on holding 287

Attribute	Discussion
Mitchell Landscape	Murray Channels and Floodplains and Murray Depression Plains are provided on Figure P2.2.
ASC soil type	The entire holding has been identified as Vertosols. Soil type is provided on Figure P2.3.
Hydrology	Single ephemeral creek is in the northwest section of the holding and a larger creek has been identified to the east of the subject land. Both ephemeral waterways run into Merran Creek which is northwest of the site and is subject to regular inundation. Site hydrology is provided on Figure P3.1.
SVTM within the subject land	PCT 0, 10, 13 and 44. Vegetation mapping based on SVTM is provided in Figure P3.1.
Category 1 lands within the subject land	**NVR map** Two areas of potential Category 1 lands identified in the NVR map which have been identified on Figure P3.1.
	Historic imagery Historic imagery from 1976 supports the draft NVR map. Evidence provided in Photo P3.5.
	Confirmed in current imagery or field verification survey Current aerial imagery from multiple data sources identifies two areas of intensive agriculture (i.e. cropping) within the restricted-access holding. Evidence of clearing for agriculture identified on surrogate site directly adjacent to restricted-access holding (Photo P3.6) which seems contiguous on aerial imagery with the restricted-access holding.
Furthest point from WSP survey	WSP field verification surveys have been undertaken on private land subject to an access agreement directly north and south of the site. The longest distance from WSP field verification survey within the holding is approximately 1.6 km. BAM VI plots applicable to this holding have been outlined in Appendix A.



Photo P3.5 1976 historic imagery



Photo P3.6 Evidence of intensive agriculture on surrogate site directly adjacent to the restricted-access holding

Within the restricted-access holding, vegetation has largely been subject to clearing and intensive agriculture (i.e. cropping) which can be seen on aerial imagery from multiple sources including historical imagery taken in 1976. As such, areas clearly subject to cropping will be included at Category 1 exempt land. The application of Category 1 lands in these areas are generally supported by SVTM application of PCT 0. Within areas of Category 1 lands, patches of vegetation (i.e. 3 or more trees within 50 m) will be assigned to PCT 13 which has been identified on surrogate sites to the north and south of the restricted-access holding and by SVTM in a similar landscape position, inundation regime and soil type. All patches of PCT 13 will be assumed to be in moderate-good condition within Category 1 lands given the guide specifies vegetation must not be considered to be degraded and contain native understorey species. However, this is considered a highly conservative approach and generally overestimates vegetation integrity of the patches. Where canopy species have been identified in aerial imagery and do not meet the definition of a patch scattered tree module will be applied, where under a conservative approach, all trees will be assumed to be Eucalyptus largiflorens that meet Class 3 benchmarks and contain hollows.

Where vegetation to the north of the restricted-access holding has been identified as PCT 7 or 10 within the surrogate site, the vegetation polygon will be extended to all contiguous vegetation within the same landscape position based on proximity to the larger watercourse identified by the hydrology layer. All vegetation associated with PCT 7 or 10 within the restricted-access holding will be considered to be in moderate-good condition.

Along the southwestern side of the restricted-access holding, vegetation has been assigned to PCT 13 given the similar landscape position, soil type and inundation regime to surrogate sites which are dominated by this community. All vegetation has been assumed to be in moderate-good condition, except where canopy vegetation has clearly been removed and vegetation exists in a stable derived state. These areas will be assigned to derived condition class. Additionally, the application of PCT 13 is supported by SVTM which identifies all woodland patches in this area as PCT 13. However, where WSP extrapolated vegetation mapping has applied PCT 13 in a derived condition state, SVTM has applied PCT 44. The application of PCT 44 throughout this area by SVTM is generally considered a misapplication of this PCT and vegetation is more likely to be derived from woodland vegetation which is extensive in the region rather than naturally treeless as historic logging and land clearing is common in this area. No areas of derived PCT 7 or 10 have been identified as PCT 13 is considered a better fit for all vegetation not adjacent to the identified watercourse.

A summary of vegetation mapping undertaken through desktop assessment is provided in Figure P3.1.

P3.2.8 Holding 307

Land access for this holding was granted for a period in late 2024- until mid 2025. During this time vegetation mapping was completed during field verification survey effort. As such, the guide was not applied to vegetation mapping within this holding. WSP verified vegetation mapping within this holding is provided on Figure P3.1 with vegetation integrity outcomes discussed in section P3.3 and Appendix A. Additional information regarding WSP field verified vegetation mapping is presented in section 2.2 and Chapter 4 of the BDAR.

P3.2.9 Holding 366

Native vegetation within this restricted-access holding is highly likely to be dominated by chenopod shrublands and is considered generally homogenous with surrounding surrogate sites. Given the extensive area of land not subject to survey and limited accessibility of public lands, SVTM identified PCTs have been adopted for this holding. All vegetation has been assigned to the highest associated condition class from surrogate sites as the holding is generally considered subject to the same grazing, clearing and climatic variables as local surrogate sites. BAM VI plots applicable to this holding have been outlined in Appendix A. Where a PCT has been identified within the SVTM but not within WSP field verified vegetation, the condition class has been updated to moderate-good and VI will be set at benchmark condition.

P3.3 Vegetation integrity

Vegetation integrity within the restricted-access holdings will be determined through the application of plot-based survey in accordance with BAM section 4.2.1 undertaken at surrogate sites (refer to Appendix A of this memo and section 4 of the BDAR). Where aerial imagery indicates vegetation has been subject to clearing activities, a derived condition class will be assumed, and vegetation integrity will be determined through the use of plot-based survey from a like condition state. Where a PCT has been identified within the SVTM but not within WSP field verified vegetation, the condition class will be updated to reflect the moderate-good condition class and VI will be set at benchmark condition.

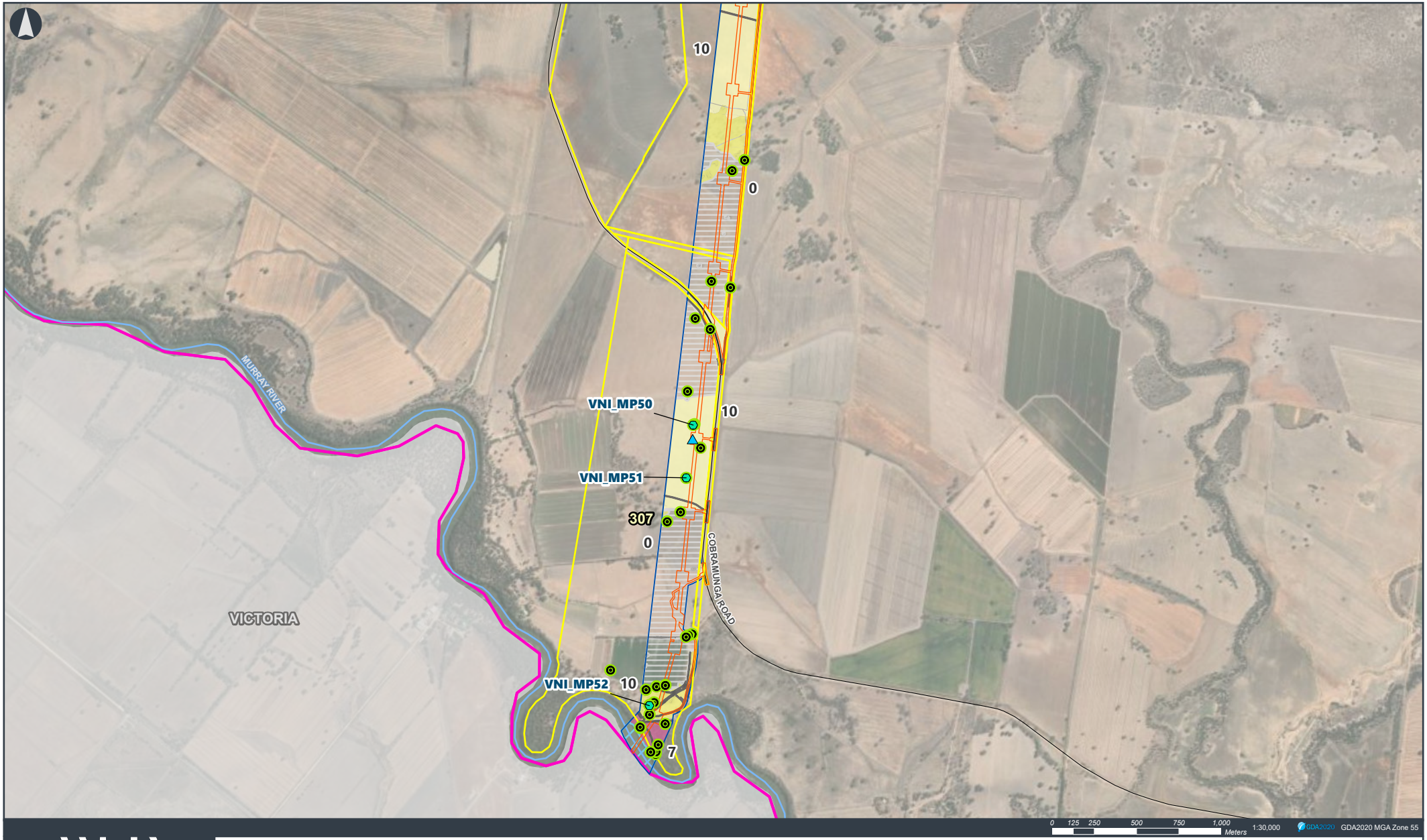
P3.4 Threatened ecological communities

Several vegetation types associated with TECs listed under the BC and EPBC Act have been identified within the restricted-access holdings. The guide states that within a restricted-access area, a TEC must be assumed wherever an association is identified in the BioNet Vegetation Classification database, unless evidence is available that demonstrates the vegetation is not a TEC. A review of all applicable vegetation types against associated TECs as outlined in the BioNet Vegetation Classification database within the surrogate sites was undertaken as part of BDAR drafting and is presented in section 4.3 and 6.2.1 of the BDAR. Within the restricted-access holdings, three vegetation types were identified to have associated TECs. Of those, all three are considered to meet the minimum requirements and listing criteria with the surrogate sites. As such, all associated vegetation within the restricted-access holdings is considered to form part of the TECs.

PCTs and associated TECs are outlined in Table P3.7 and Figure P3.1.

Table P3.7 Threatened ecological communities within the restricted-access holdings

IBRA subregion	Holding	PCT	Condition	BC Act listing	EPBC Act listing
Murrumbidgee	H201	PCT 23 – Yarran tall open shrubland of the sandplains and plains of the semi-arid (warm) and arid climate zones	Derived	*Acacia melvillei* Shrubland in the Riverina and Murray-Darling Depression bioregions – Endangered	Not listed
	H366	PCT 28 – White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone	SVTM	Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregion – Endangered	Not listed
		PCT 46 – Curly Windmill Grass – spear grass – wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion	Moderate-good	Not listed	Natural Grasslands of the Murray Valley Plains – Critically Endangered
			SVTM		
Murray Fans	H286	PCT 28 – White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone	Derived	Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregion – Endangered	Not listed
			Derived – Tall Shrubland		



wsp

VNI West – BDAR

Figure P3.1
Native vegetation and NVR within restricted-access holdings
Page 1 of 11

Legend

- Main road
- Named waterway
- Amended project footprint
- Subject land
- Property with restricted access
- IBRA Subegion
- Flora BAM survey
- Cat 1 assessment
- Rapid flora survey (EIS 2025)

Verified plant community types

Native vegetation
- 10,Derived - No Offset
- 10,Thinned
- 7,Moderate-good

Non-native vegetation
- 0,Irrigation drain
- 0,Miscellaneous ecosystems - Category 1 lands
- 0,Miscellaneous ecosystems - Category 2 lands assessed under the scattered tree module
- 0,Ornamental plantings (Windbreaks)
- 0,Road
- 0,Track - Minor
- 0,Waterbody (Farm Dam)
- 0,Waterbody (River)

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Data sources: NSW EPI, DELWP, WSP, EnergyConnect



VNI West – BDAR

Figure P3.1
Native vegetation and NVR within restricted-access holdings
Page 2 of 11

Legend

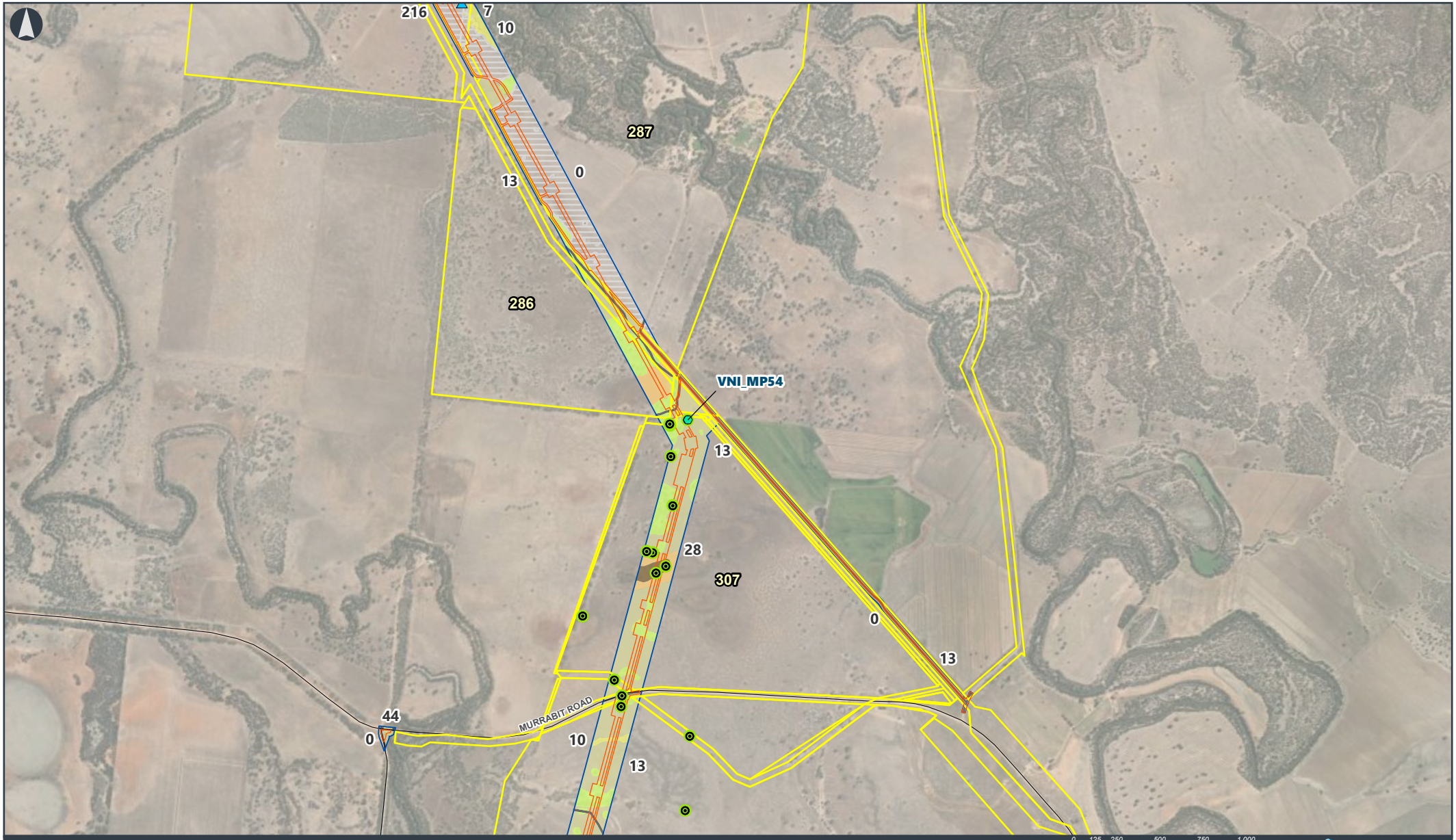
- Main road
- Amended project footprint
- Subject land
- Property with restricted access
- IBRA Subegion
- Flora BAM survey
- Rapid flora survey (EIS 2025)

Verified plant community types

Native vegetation
- 10,Derived - No Offset
- 10,Thinned
- 13,Derived - No Offset
- 13,Moderate-good

Non-native vegetation
- 0,Irrigation drain
- 0,Miscellaneous ecosystems - Category 1 lands
- 0,Road
- 0,Track - Minor
- 0,Waterbody (Farm Dam)

Data sources: NSW EPI, DELWP, WSP, EnergyConnect



VNI West – BDAR

Figure P3.1
Native vegetation and NVR within restricted-access holdings
Page 3 of 11

Legend

- Main road
- Amended project footprint
- Subject land
- Property with restricted access
- IBRA Subegion
- Flora BAM survey
- Cat 1 assessment
- Rapid flora survey (EIS 2025)

Verified plant community types

Native vegetation
- 10,SVTM
- 10,Thinned
- 13,Derived - No Offset
- 13,Moderate-good
- 216,Moderate-good
- 28,Derived
- 28,Derived - Tall Shrubland
- 44,SVTM
- 7,Moderate-good

Non-native vegetation
- 0,Irrigation drain
- 0,Miscellaneous ecosystems - Category 1 lands
- 0,Miscellaneous ecosystems - Highly disturbed areas with no or limited native vegetation
- 0,Road
- 0,SVTM
- 0,Track - Minor

Data sources: NSW EPI, DELWP, WSP, EnergyConnect



VNI West – BDAR

Figure P3.1
Native vegetation and NVR within restricted-access holdings
Page 4 of 11

Legend

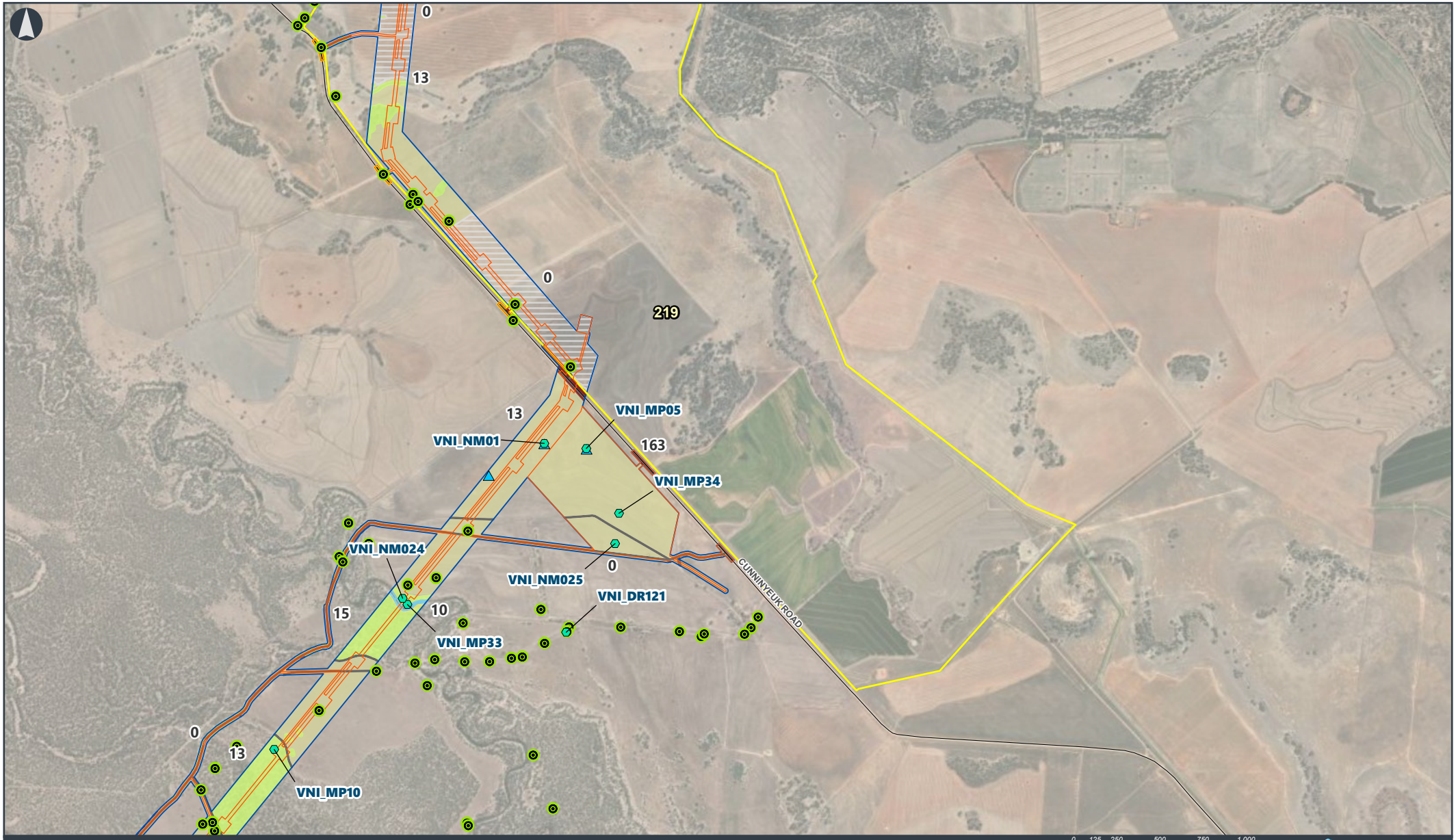
- Main road
- Amended project footprint
- Subject land
- Property with restricted access
- IBRA Subegion
- Flora BAM survey
- Cat 1 assessment
- Rapid flora survey (EIS 2025)

Verified plant community types

Native vegetation
- 10,SVTM
- 10,Thinned
- 11,Moderate-good
- 13,Derived - No Offset
- 13,Moderate-good
- 17,Moderate-good
- 216,Moderate-good
- 237,Moderate-good
- 44,SVTM
- 7,Moderate-good

Non-native vegetation
- 0,Irrigation drain
- 0,Miscellaneous ecosystems - Category 1 lands
- 0,Miscellaneous ecosystems - Category 2 lands assessed under the scattered tree module
- 0,Miscellaneous ecosystems - Highly disturbed areas with no or limited native vegetation
- 0,Road
- 0,SVTM
- 0,Track - Major
- 0,Track - Minor

Data sources: NSW EPI, DELWP, WSP, EnergyConnect



VNI West – BDAR

Figure P3.1
Native vegetation and NVR within restricted-access holdings
Page 5 of 11

Legend

- Main road
- Amended project footprint
- Subject land
- Property with restricted access
- IBRA Subegion
- Flora BAM survey
- Cat 1 assessment
- Rapid flora survey (EIS 2025)

Verified plant community types

Native vegetation
- 10,Thinned
- 13,Derived - No Offset
- 13,Moderate-good
- 15,Derived - No Offset
- 15,Moderate-good
- 15,Thinned
- 163,Moderate-good

Non-native vegetation
- 0,Irrigation drain
- 0,Miscellaneous ecosystems - Category 1 lands
- 0,Pre-existing Infrastructure
- 0,Road
- 0,Track - Minor
- 0,Waterbody (Farm Dam)
- 0,Waterbody (River)

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Data sources: NSW EPI, DELWP, WSP, EnergyConnect



VNI West – BDAR

Figure P3.1
Native vegetation and NVR within restricted-access holdings
Page 6 of 11

Legend

- Main road
- Amended project footprint
- Subject land
- Property with restricted access
- IBRA Subegion
- Flora BAM survey
- Cat 1 assessment
- Rapid flora survey (EIS 2025)

Verified plant community types

Native vegetation
- 10,Thinned
- 13,Derived - No Offset
- 13,Moderate-good
- 13,Native plantings

Non-native vegetation
- 0,Irrigation drain
- 0,Miscellaneous ecosystems - Category 1 lands
- 0,Miscellaneous ecosystems - Category 2 lands assessed under the scattered tree module
- 0,Pre-existing Infrastructure
- 0,Road
- 0,Track - Minor
- 0,Waterbody (Creekline)

Data sources: NSW EPI, DELWP, WSP, EnergyConnect



VNI West – BDAR

Figure P3.1
Native vegetation and NVR within restricted-access holdings
Page 7 of 11

Legend

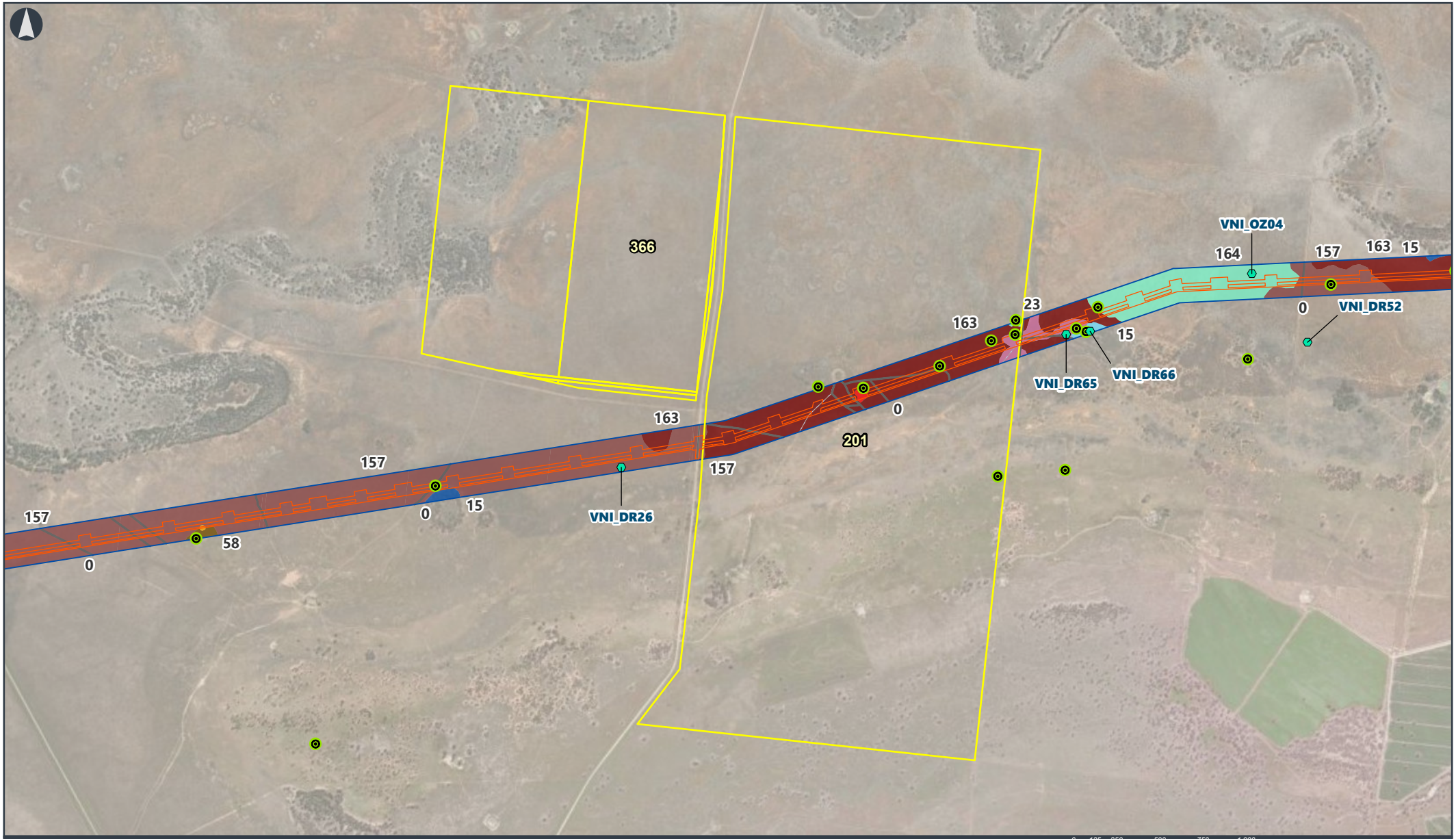
- Main road
- Named waterway
- Amended project footprint
- Subject land
- Property with restricted access
- IBRA Subegion
- Rapid flora survey (EIS 2025)

Verified plant community types

Native vegetation
- 10,Thinned
- 13,Derived - No Offset
- 13,Moderate-good
- 17,Moderate-good
- 170,Derived
- 170,Thinned
- 20,Thinned
- 216,Moderate-good

Non-native vegetation
- 0,Irrigation drain
- 0,Miscellaneous ecosystems - Category 1 lands
- 0,Miscellaneous ecosystems - Category 2 lands assessed under the scattered tree module
- 0,Miscellaneous ecosystems - Highly disturbed areas with no or limited native vegetation
- 0,Road
- 0,Track - Minor
- 0,Waterbody (Creekline)
- 0,Waterbody (River)

Data sources: NSW EPI, DELWP, WSP, EnergyConnect



VNI West – BDAR

Figure P3.1
Native vegetation and NVR within restricted-access holdings
Page 8 of 11

Legend

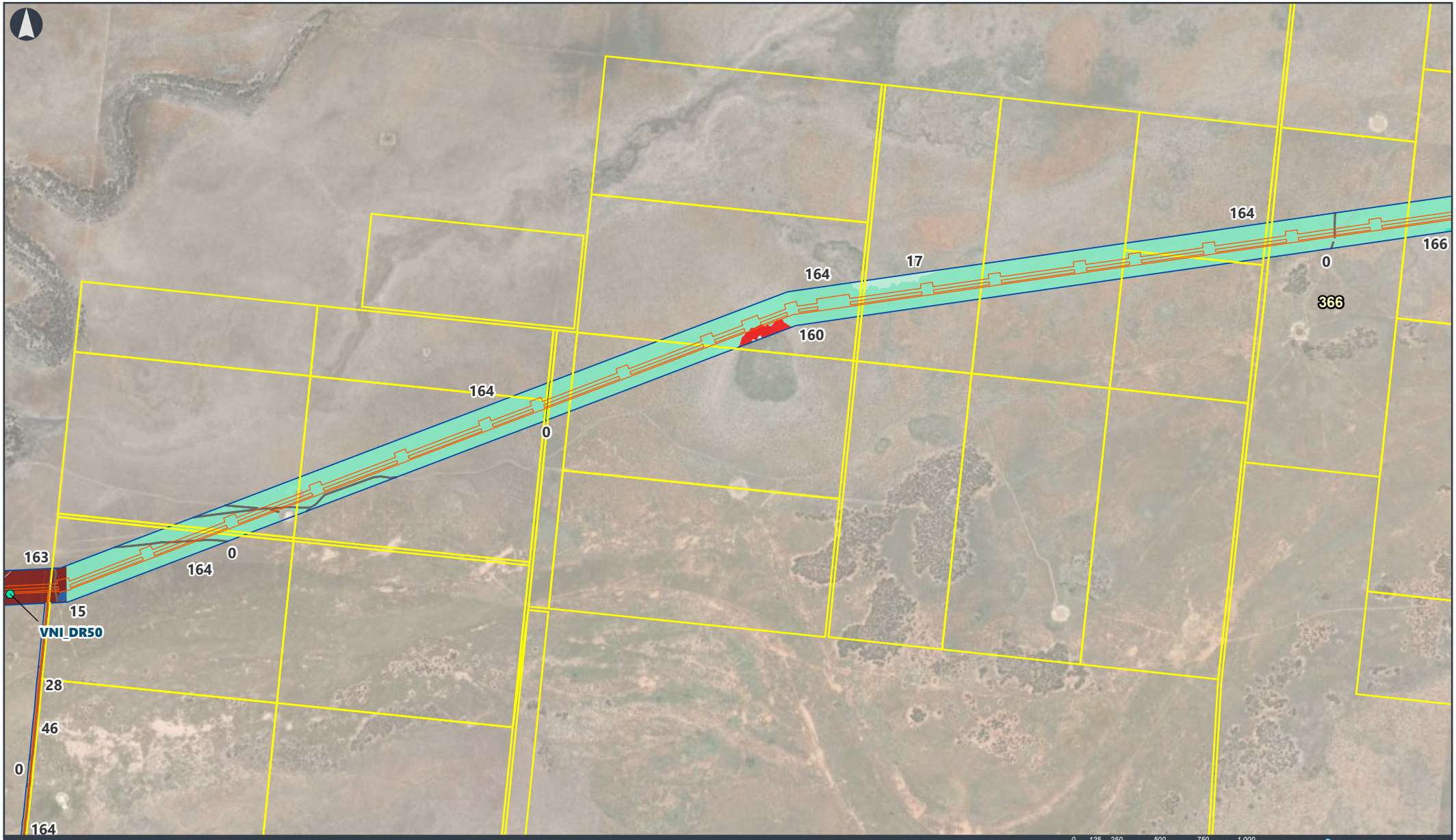
- Amended project footprint
- Subject land
- Property with restricted access
- IBRA Subegion
- Flora BAM survey
- Rapid flora survey (EIS 2025)

Verified plant community types

Native vegetation
- 15,Derived
- 15,Moderate-good
- 157,Moderate-good
- 160,Moderate-good
- 163,Moderate-good
- 164,Moderate-good
- 23,Derived
- 58,Derived
- 58,Thinned

Non-native vegetation
- 0,Irrigation drain
- 0,Road
- 0,Track - Minor

Data sources: NSW EPI, DELWP, WSP, EnergyConnect



VNI West – BDAR

Figure P3.1
Native vegetation and NVR within restricted-access holdings
Page 9 of 11

Legend

- Amended project footprint
- Subject land
- Property with restricted access
- IBRA Subegion
- Flora BAM survey

Verified plant community types

Native vegetation

- 15,Moderate-good
- 160,Moderate-good
- 163,Moderate-good
- 163,SVTM
- 164,Moderate-good
- 164,SVTM
- 166,Moderate-good
- 17,Moderate-good
- 28,SVTM
- 46,SVTM

Non-native vegetation

- 0,Irrigation drain
- 0,SVTM
- 0,Track - Major
- 0,Track - Minor
- 0,Waterbody (Farm Dam)

Data sources: NSW EPI, DELWP, WSP, EnergyConnect



VNI West – BDAR

Figure P3.1
Native vegetation and NVR within restricted-access holdings
Page 10 of 11

Legend

- Main road
- Amended project footprint
- Subject land
- Property with restricted access
- IBRA Subegion
- Rapid flora survey (EIS 2025)

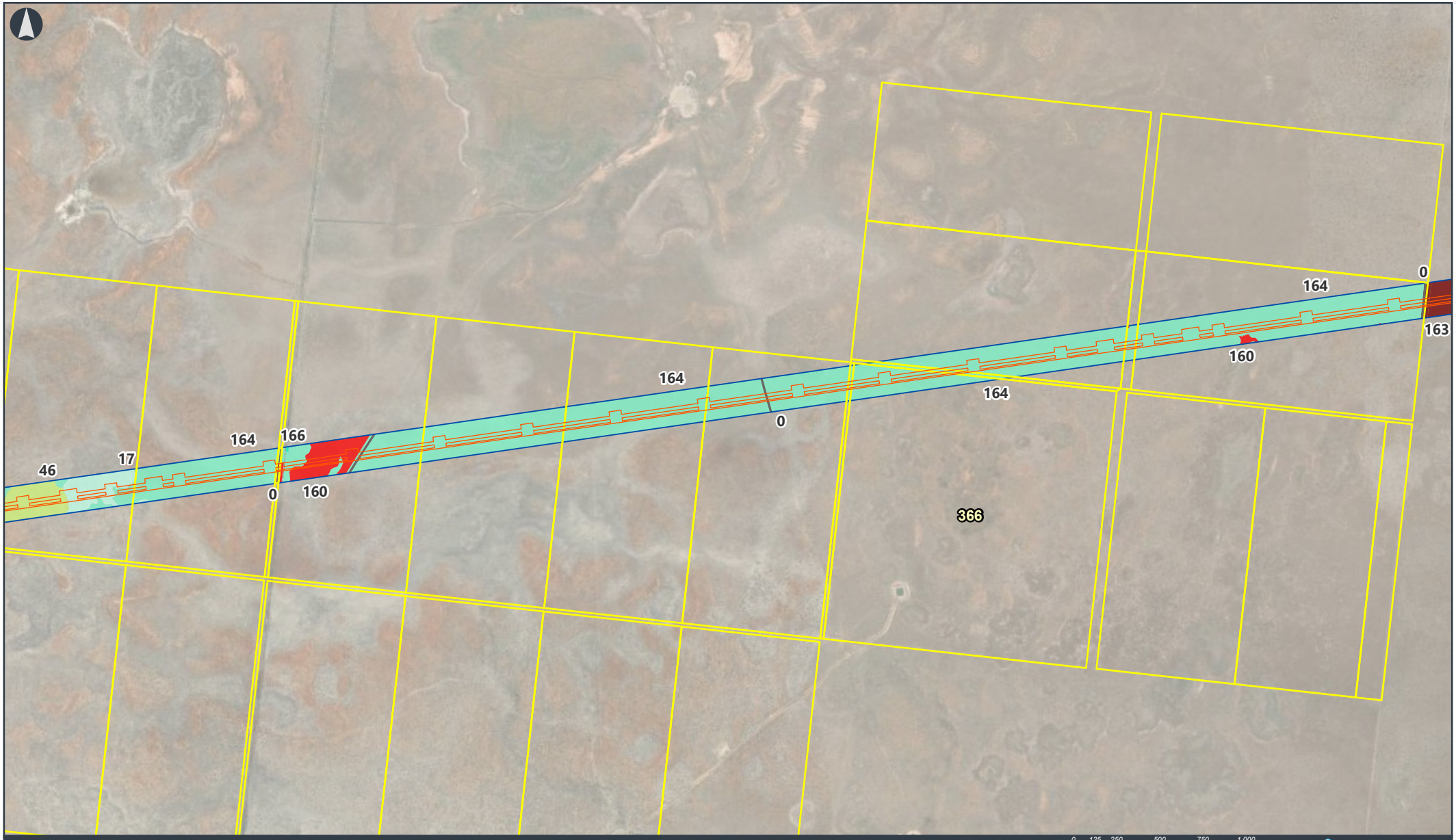
Verified plant community types

Native vegetation
- 157,Moderate-good
- 164,Moderate-good
- 166,Moderate-good
- 17,Moderate-good
- 46,Moderate-good

Non-native vegetation
- 0,Irrigation drain
- 0,Road
- 0,Track - Minor

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Data sources: NSW EPI, DELWP, WSP, EnergyConnect



VNI West – BDAR

Figure P3.1
Native vegetation and NVR within restricted-access holdings
Page 11 of 11

Legend

- Amended project footprint
- Subject land
- Property with restricted access
- IBRA Subegion

Verified plant community types

Native vegetation
- 160,Moderate-good
- 163,Moderate-good
- 164,Moderate-good
- 166,Moderate-good
- 17,Moderate-good
- 46,Moderate-good

Non-native vegetation
- 0,Irrigation drain
- 0,Track - Minor

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Data sources: NSW EPI, DELWP, WSP, EnergyConnect

P4. Assessing the habitat suitability and presence of threatened species

Candidate flora and fauna species that have been identified in section 5 of the BDAR, which have not been recorded in surrogate lands following extensive field survey, will be considered for application of the guide. Assessment of habitat suitability for threatened species on restricted-access holdings will include an assessment of:

- the threatened entities with a likelihood to occur on the restricted-access holdings
- the PCTs present on each restricted-access property according to WSP generated mapping (as described above)
- the presence of factors such as NSW (Mitchell) landscapes and Soil ASC Order
- any listed habitat and geographic constraints where relevant (discussed in section 5 of the BDAR)
- existing threatened species records including WSP verified records from survey effort undertaken for the project and BioNet Atlas records (DCCEEW 2026), and
- survey extent undertaken on suitable surrogate sites, especially in areas where the landscape is considered to be homogenous.

Section 4.2 of the guide outlines the steps required to determine the presence of relevant habitat constraints and microhabitats within the restricted-access holdings. Habitat constraints relevant to the project include the presence of:

- Candidate flora species
  - semi-permanent and ephemeral wetlands including table drains and farm dams
  - alluvial plains and plains
  - sandy rises and loamy clay flats on the floodplains of the Murray River and its tributaries in the Riverina IBRA bioregion
  - heavy grey clay soils and claypans or shallow depressions.
- Candidate fauna species
  - hollow-bearing trees
  - fallen or dead timbers, including logs, and
  - mistletoe density.

Where habitat constraints cannot be confidently confirmed remotely, species will be assumed present. This includes epiphytes, fallen/standing dead timber, including logs, hollow-bearing trees and native ground cover as outlined by section 4.2 of the guide. Additionally, all microhabitats, as described by section 2.5.3.7 of the BDAR, are assumed present for all relevant threatened flora species given the difficulty of identifying these features remotely.

P4.1 Existing threatened species records

A review of existing threatened flora species records, including WSP verified records from surrogate sites and BioNet records was undertaken with the results presented in Table P4.1, Figure P4.1 and Figure P4.2. Threatened flora species identified to occur within surrogate sites or within five kilometres of an impacted area within a remote access holding are considered likely to occur within the restricted area and assumed species presence has been retained.

Table P4.1 Existing threatened flora species records and associated restricted-access holdings

Scientific name	Common name	BC Act	SAII	EPBC Act	Existing records and retained assumed presence
Austrostipa metatoris	–	V	No	V	Species has not been recorded from surrogate sites within the Murray Fans IBRA subregion. Species has been recorded within 5 km of the following holdings: — H208 (10 records) — H219 (7 records). No suitable habitat types (PCTs) have been identified on H208 or H219.
Austrostipa wakoolica	–	E	No	E	Species has not been recorded from surrogate sites in either the Murrumbidgee or Murray Fans IBRA subregion. Species has been recorded within 5 km of the following holdings: — H208 (6 records) — H219 (2 records) — H281 (6 records) — H286 (6 records) — H287 (6 records). No suitable habitat types (PCTs) have been identified on H208, H219, H281 or H287. Assumed presence for *A. wakoolica* will be retained on H286 due to suitable habitat being identified and the species being recorded within 5 km of the site.
Brachyscome papillosa	Mossgiel Daisy	V	No	V	Species has been recorded from surrogate sites within the Murrumbidgee IBRA subregion. Species has been recorded within 5 km of the following holdings: — H201 (2 records) — H366 (221 records). Assumed species presence polygons will be retained for all restricted-access holdings within the Murrumbidgee IBRA subregion including H201 and H366 due to suitable habitat being identified, the species being recorded within surrogate sites and the species being recorded within 5 km of the site.
Eleocharis obicis	Spike Rush	V	No	V	Species has been recorded from surrogate sites in the Murray Fans and Murrumbidgee IBRA subregion. As such, assumed presence of *E. obicis* will be retained for all suitable habitat within the restricted-access holdings for both subregions.
Eucalyptus leucoxylon subsp. *pruinosa*	Yellow Gum	V	No	-	Species has been recorded from surrogate sites in the Murray Fans IBRA subregion. As such, assumed presence for *E. leucoxylon* subsp. *pruinosa* will be retained for all suitable habitat within the restricted-access holdings for the Murray Fans IBRA subregion.

Scientific name	Common name	BC Act	SAII	EPBC Act	Existing records and retained assumed presence
Lepidium monoplocoides	Winged Peppercress	E	No	E	Species has been recorded from surrogate sites in the Murrumbidgee IBRA subregion. As such, assumed presence for *L. monoplocoides* will be retained for all suitable habitat within the restricted-access holdings for the Murrumbidgee IBRA subregion.
Pilularia novae-hollandiae	Austral Pillwort	E	No	–	Species has been recorded from surrogate sites in the Murrumbidgee IBRA subregion. As such, assumed presence *P. novae-hollandiae* will be retained for all suitable habitat within the restricted-access holdings for the Murrumbidgee IBRA subregion.
Maireana cheelii	Chariot Wheels	V	No	V	Species has been recorded from surrogate sites in the Murrumbidgee and Murray Fans IBRA subregion. As such, assumed presence for *M. cheelii* will be retained for all suitable habitat within the restricted-access holdings for the Murrumbidgee and Murray Fans IBRA subregion.
Swainsona murrayana	Slender Darling-pea	V	No	V	Species has been recorded from surrogate sites in the Murrumbidgee IBRA subregion. Species has been recorded within 5 km of the following holdings: — H366 (4 records). Assumed presence for *S. murrayana* will be retained for all restricted-access holdings for the Murrumbidgee IBRA subregion.
Litoria raniformis	Southern Bell Frog	E	No	V	Species has been recorded from surrogate sites in the Murrumbidgee and Murray Fans IBRA subregion. Additionally, species has been recorded within 5 km of the following holdings: — H201 (3 records) — H208 (1 record) — H219 (1 record) — H307 (397 records) — H366 (2 records). Assumed presence for Southern Bell Frog will be retained for all restricted-access holdings for the Murrumbidgee and Murray Fans IBRA subregion.

Scientific name	Common name	BC Act	SAII	EPBC Act	Existing records and retained assumed presence
Burhinus grallarius	Bush Stone-curlew	E	No	–	Species has been recorded from surrogate sites in the Murray Fans IBRA subregion. Species has been recorded within 5 km of the following holdings: — H208 (1 record) — H281 (1 record) — H286 (1 record) — H287 (1 record) — H307 (1 record). Assumed presence for Bush Stone-curlew will be retained for all restricted-access holdings for the Murray Fans IBRA subregion.
Haliaeetus leucogaster	White Bellied Sea Eagle	V	No	–	Species has been recorded from surrogate sites in the Murray Fans IBRA subregion. Assumed presence for White-bellied Sea Eagle will be retained for all restricted-access holdings for the Murray Fans IBRA subregion.
Hieraaetus morphnoides	Little Eagle	V	No	–	Species has been recorded from surrogate sites in the Murrumbidgee IBRA subregion. Species has been recorded within 5 km of the following holdings: — H201 (1 record). Assumed presence for Little Eagle will be retained for all restricted-access holdings for the Murrumbidgee IBRA subregion.
Lophochroa leadbeateri	Pink Cockatoo	V	No	E	Species has been recorded from surrogate sites in the Murrumbidgee IBRA subregion. Species has been recorded within 5 km of the following holdings: — H366 (3 records). Assumed presence for Pink Cockatoo will be retained for all restricted-access holdings for the Murrumbidgee IBRA subregion.
Myotis macropus	Southern Myotis	V	No	–	Species has been recorded from surrogate sites in the Murrumbidgee and Murray Fans IBRA subregion. Assumed presence for Southern Myotis will be retained for all restricted-access holdings for the Murrumbidgee and Murray Fans IBRA subregions.

P4.2 Presence of abiotic factors, habitat constraints and geographic constraints

Abiotic factors, including NSW (Mitchell) landscape and soil type, and listed habitat and geographic constraints have been reviewed for each restricted-access holding and applicable surrogate sites. Further discussion of abiotic factors, habitat constraints and geographic constraints by species is provided in section 5.2.1 and 5.2.2 of the BDAR. All geographic constraints applied within the BDAR have been retained for application for restricted-access holdings. Abiotic factors applicable to limit species habitat within the surrogate lands include:

- restriction of suitable habitat for *Convolvulus tedmoorei* to areas identified as self-mulching grey clays as determined by the ASC soil type map.

All other abiotic factors and habitat constraints are considered present within the restricted-access holdings due to presence within surrogate sites or difficulty of assessment remotely.

P4.3 Species proposed for exclusion through surrogate survey

A total of 11 candidate flora species are proposed to be excluded from presence within restricted-access holdings of the subject land based on targeted survey within the surrogate sites (Table P4.2). A total of four fauna species are proposed to be excluded from restricted areas of the amended project footprint based on targeted survey within the surrogate sites (Table P4.3). All other candidate species have been retained as assumed present within the restricted-access holdings. Areas of associated habitat for the species proposed for exclusion under the guide, were generated based on potential habitat types (PCTs) and constraints outlined in Chapter 5 of the BDAR.

Table P4.2 Threatened flora species excluded under the under the guide

Scientific name	Common name	BC Act	SAII	EPBC Act	Assumed habitat within restricted-access holding (ha)
Austrostipa metatoris	-	V	No	V	10.63 ha in the Murray Fans subregion
Austrostipa wakoolica	-	E	No	E	12.29 ha in the Murrumbidgee subregion 7.35 ha in the Murray Fans subregion
Calotis moorei	Burr-daisy	E	Yes	E	40.96 ha in the Murrumbidgee subregion
Convolvulus tedmoorei	Bindweed	E	Yes	-	41.59 ha in the Murrumbidgee subregion
Lepidium monoplocoides	Winged Peppercress	E	No	E	81.65 ha in the Murray Fans subregion
Leptorhynchos orientalis	Lanky Buttons	E	No	-	70.25 ha in the Murrumbidgee subregion
Pilularia novae-hollandiae	Austral Pillwort	E	No	-	81.42 ha in the Murray Fans subregion
Sclerolaena napiformis	Turnip Copperburr	E	No	E	70.25 ha in the Murrumbidgee subregion
Solanum karsense	Menindee Nightshade	V	No	V	21.82 ha in the Murrumbidgee subregion
Swainsona plagiotropis	Red Darling-pea	V	No	V	70.25 ha in the Murrumbidgee subregion
Swainsona sericea	Silky Swainson-pea	V	No	–	71.67 ha in the Murrumbidgee subregion 7.35 ha in the Murray Fans subregion

Table P4.3 Threatened fauna species excluded under the under the guide

Scientific name	Common name	BC Act	SAII	EPBC Act	Assumed habitat within restricted-access holding (ha)
Ardeotis australis	Australian Bustard	E	No	–	516.12 ha within the amended project footprint
Ninox connivens	Barking Owl	V	No	–	260.88 ha within the amended project footprint
Tyto novaehollandiae	Masked Owl	V	No	–	260.65 ha within the amended project footprint
Hemiaspis damelii	Grey Snake	E	No	E	390.76 ha within the amended project footprint

P4.4 Survey undertaken on surrogate sites

P4.4.1 Candidate threatened flora species survey

Extensive targeted candidate threatened flora surveys have been undertaken throughout the surrogate sites in like for like PCTs and condition classes to the assumed habitats associated with species within these restricted-access holdings.

Field survey techniques for targeted seasonal surveys are presented within section 2.5 of the BDAR and were in general accordance with *Surveying threatened plants and their habitats: NSW guide for the Biodiversity Assessment Method* (DPIE 2020). Survey effort types include:

- two-phase grid-based systematic survey
- parallel field traverses
- microhabitat searches, and
- trackside and opportunistic survey effort.

Targeted threatened flora survey effort undertaken in surrogate sites, including areas directly adjacent and contiguous with the restricted areas have been assessed for adequacy for each species proposed under the guide. A summary of the surrogate survey area for each candidate species retained for exclusion through the guide by IBRA subregion is provided in Table P4.4 and Table P4.5. Survey effort within the surrogate sites has been restricted to surveys that were undertaken in corresponding species seasonal requirements in like for like habitats as outlined in section 5 of the BDAR.

Table P4.4 Percentage survey in surrogate sites for excluded flora in restricted-access holdings (Murrumbidgee IBRA subregion)

Scientific name	PCT	Condition	Assumed habitat within restricted area (Ha)	Like for like habitat subject to adequate survey within surrogate sites (Ha)	Total percentage of habitat within surrogate areas subject to survey (%)
Austrostipa wakoolica	17	Moderate-good	12.29	13.09	51.58
	TOTAL		**12.29**	**13.09**	**51.58**
Calotis moorei	23	Derived	1.42	37.83	96.38
	157	Moderate-good	19.77	407.63	95.37
	TOTAL		**40.96**	**445.46**	**91.58**
Convolvulus tedmoorei	17	Moderate-good	12.29	32.02	72.26
	157	Moderate-good	19.77	395.71	95.24
	160	Moderate-good	9.53	77.99	89.11
	TOTAL		**41.59**	**505.72**	**92.40**
Leptorhynchos orientalis	46	Moderate-good	70.25	199.40	73.95
	TOTAL		**70.25**	**199.40**	**73.95**
Sclerolaena napiformis	46	Moderate-good	70.25	199.40	73.95
	TOTAL		**70.25**	**199.40**	**73.95**
Solanum karsense	17	Moderate-good	12.29	n/a	n/a
	160	Moderate-good	9.53	n/a	n/a
	TOTAL		**21.82**	**n/a**	n/a
Swainsona plagiotropis	46	Moderate-good	70.25	199.40	73.95
	TOTAL		**70.25**	**199.40**	**73.95**
Swainsona sericea	23	Derived	1.42	37.83	96.38
	46	Moderate-good	70.25	199.40	73.95
	TOTAL		**71.67**	**237.23**	**76.80**

1. Inclusive of all vegetation conditions associated with the PCT within the surrogate sites
2. Not indicative of actual suitable habitat due to species being restricted by geographic constraint of "West of Maude"

Table P4.5 Percentage survey in surrogate sites for excluded flora in restricted-access holdings (Murray Fans IBRA subregion)

Scientific name	PCT	Condition	Assumed habitat within restricted area (ha)	Like for like habitat subject to adequate survey within surrogate sites (ha)	Total percentage of habitat within surrogate areas subject to survey (%)
Austrostipa metatoris	7	Moderate-good	3.28	8.24	71.53
	28	Derived	5.83	0.82	12.37
	28	Derived – Tall Shrubland	1.52	0.68	30.78
	TOTAL		**10.63**	**9.74**	**47.82**
Austrostipa wakoolica	28	Derived	5.83	0.82	12.37
	28	Derived – Tall Shrubland	1.52	0.68	30.78
	TOTAL		**7.35**	**1.50**	**16.94**
Lepidium monoplocoides	13	Moderate-good	81.42	266.77	76.62
	163	Moderate-good	0.23	71.34	99.68
	TOTAL		**81.65**	**338.10**	**80.55**
Pilularia novae-hollandiae	13	Moderate-good	81.42	266.77	76.62
	TOTAL		**81.42**	**266.77**	**76.62**
Swainsona sericea	28	Derived	5.83	0.82	12.37
	28	Derived – Tall Shrubland	1.52	0.68	30.78
	TOTAL		**7.35**	**1.50**	**16.94**

1. Inclusive of all vegetation conditions associated with the PCT within the surrogate sites

One species, *Solanum karsense*, has been identified to not be suitable for the application of the guide due to a lack of survey effort within surrogate sites and assumed presence has been retained within the restricted-access holdings. While survey effort undertaken within the surrogate sites demonstrates a significant representative of coverage for all other species retained for exclusion under the guide, with all species having greater than 50% (most are >70%) of the like for like habitat surveyed within Murrumbidgee IBRA subregion.

Most species within the Murray Fans IBRA subregion have had 50% of the like for like habitat surveyed within surrogate sites. Two species, *Austrostipa wakoolica* and *Swainsona sericea* have limited like for like habitat surveyed within this subregion. However, large areas of like for like habitat within the Murrumbidgee IBRA subregion has been adequately surveyed and the survey effort undertaken within this subregion is considered sufficient for these species to be excluded under the guide within the Murray Fans.

Assumed species presence for all other candidate threatened flora species outlined in Table P4.4 and Table P4.5 have been assessed as having adequate survey effort within surrogate sites and are not considered to occur within areas of restricted-access where assumed presence has been retained in Table P4.1.

Where assumed species presence polygons for these species have been removed from assessment, no credit liability will be generated by these species within restricted-access holdings. As the BAM-C cases for the project were already drafted prior to the publishing of the guide, no additional BAM-C have been produced to reflect the restricted-access holdings specifically.

P4.4.2 Candidate threatened fauna species survey

Extensive targeted candidate threatened fauna surveys have been undertaken throughout the surrogate sites in like for like PCTs to the assumed habitats associated with species within these restricted-access holdings.

Field survey techniques for targeted seasonal survey are presented within section 2.6 of the BDAR and are generally in accordance with the field survey guidelines outlined in section 2.6.3.1 of the BDAR. Survey effort types for species excluded under the guide includes:

- diurnal bird survey
- broadcast surveys (i.e. call playback), and
- spotlighting.

Targeted threatened fauna survey effort undertaken in surrogate sites, including areas directly adjacent and contiguous with the restricted-access holdings have been assessed for adequacy for each species proposed under the guide. A summary of the like for like habitat within the surrogate sites for each candidate species is provided in Table P4.6.

Table P4.6 Percentage survey in surrogate sites for excluded fauna in restricted-access holdings

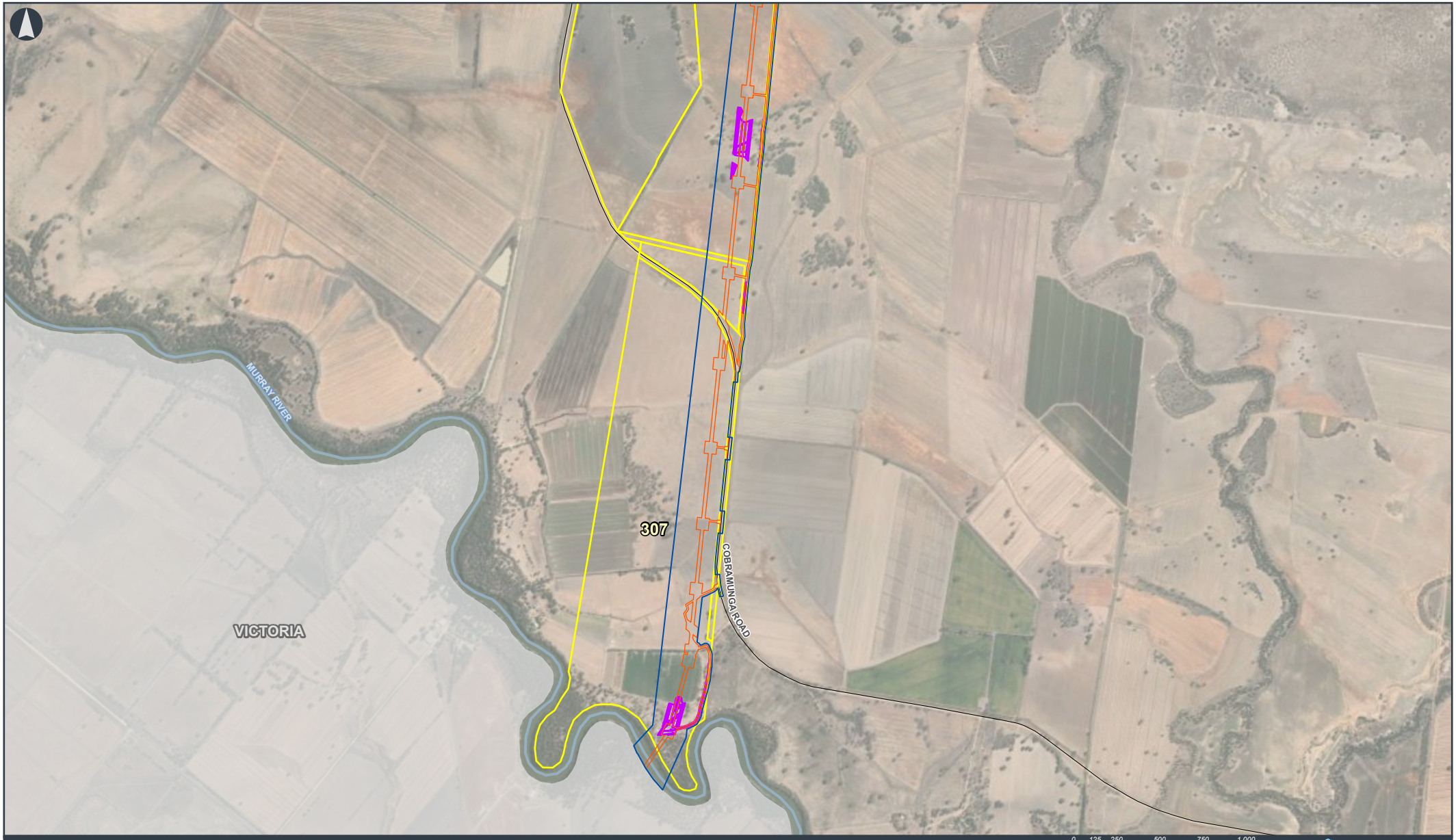
Common name	PCT	Assumed habitat within restricted area (ha)	Like for like habitat within surrogate sites (ha)	Total percentage of habitat within surrogate areas subject to survey (%)
Australian Bustard	15	0.23	299.44	99.9
	23	1.42	38.03	96.4
	28	7.35	135.19	94.8
	46	70.25	217.65	75.6
	157	19.77	413.14	95.4
	160	9.68	87.89	90.1
	163	37.65	313.19	89.3
	164	369.40	1046.08	73.9
	166	0.33	0.00	0
	216	0.02	35.61	99.9
Total		**516.12**	**2586.21**	**83.4**
Barking Owl	7	3.28	10.03	75.3
	10	91.94	50.25	35.3
	13	165.42	374.28	69.4
	15	0.23	299.44	99.9
Total		**260.88**	**733.99**	**73.8**

Common name	PCT	Assumed habitat within restricted area (ha)	Like for like habitat within surrogate sites (ha)	Total percentage of habitat within surrogate areas subject to survey (%)
Masked Owl	7	3.28	10.03	75.3
	10	91.94	50.25	35.3
	13	165.42	374.28	69.3
Total		**260.65**	**434.55**	**62.5**
Grey Snake	7	3.28	10.03	75.3
	10	91.94	50.25	35.3
	13	165.42	374.28	69.3
	15	0.23	299.44	99.9
	17	12.29	41.87	77.3
	46	70.25	217.65	75.6
	160	9.68	87.89	90.1
	166	37.65	313.19	89.3
Total		**390.76**	**1394.59**	**78.1**

1. Inclusive of all vegetation conditions associated with the PCT within the surrogate sites where the species is not reliant on specific habitat features not present within that condition class (i.e. habitat in derived condition has not been included as like for like habitat for species that require hollows).

The surrogate surveys demonstrate significant representative coverage of each species habitat within the amended project footprint, with all species having greater than 60% of the representative like for like habitats surveyed. As such, assumed species presence for all candidate species presented in Table P4.6 have been assessed as having adequate survey effort within surrogate sites and are not considered to occur within areas of restricted-access.

Assumed species presence polygons for these species have been removed from assessment and no credit liability will be generated by these species within restricted-access holdings. As the BAM-C cases for the project were already drafted prior to the publishing of the guide, no additional BAM-C have been produced to reflect the restricted-access holdings specifically.



wsp

VNI West – BDAR

Figure P4.1
Candidate threatened flora species within the restricted access holdings
Page 1 of 11

Legend

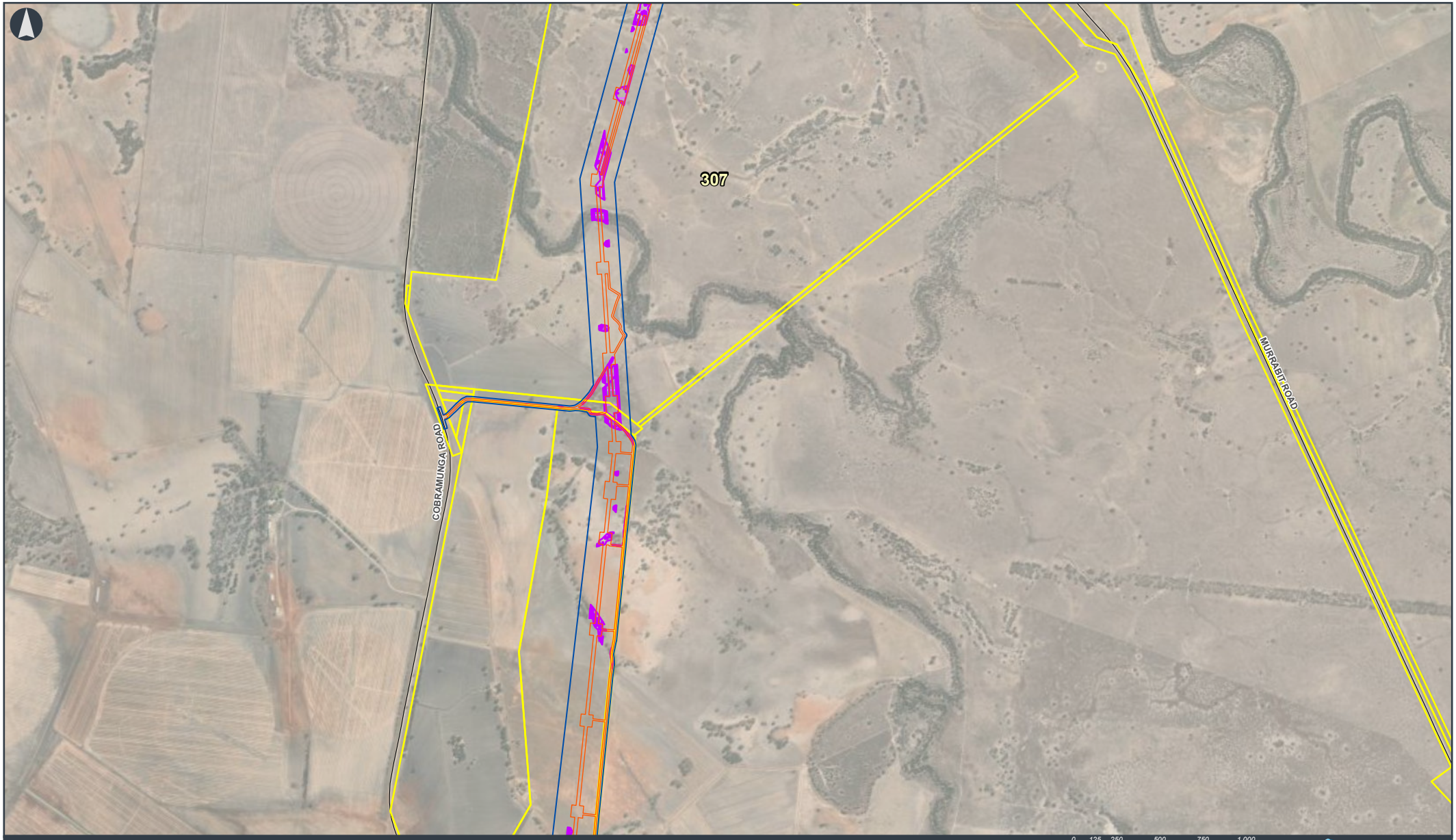
- Main road
- Named waterway
- Amended project footprint
- Subject land
- Property with restricted access

Assumed flora species polygons

- *Eleocharis obicis*

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Data sources: NSW EPI, DELWP, WSP, EnergyConnect



VNI West – BDAR

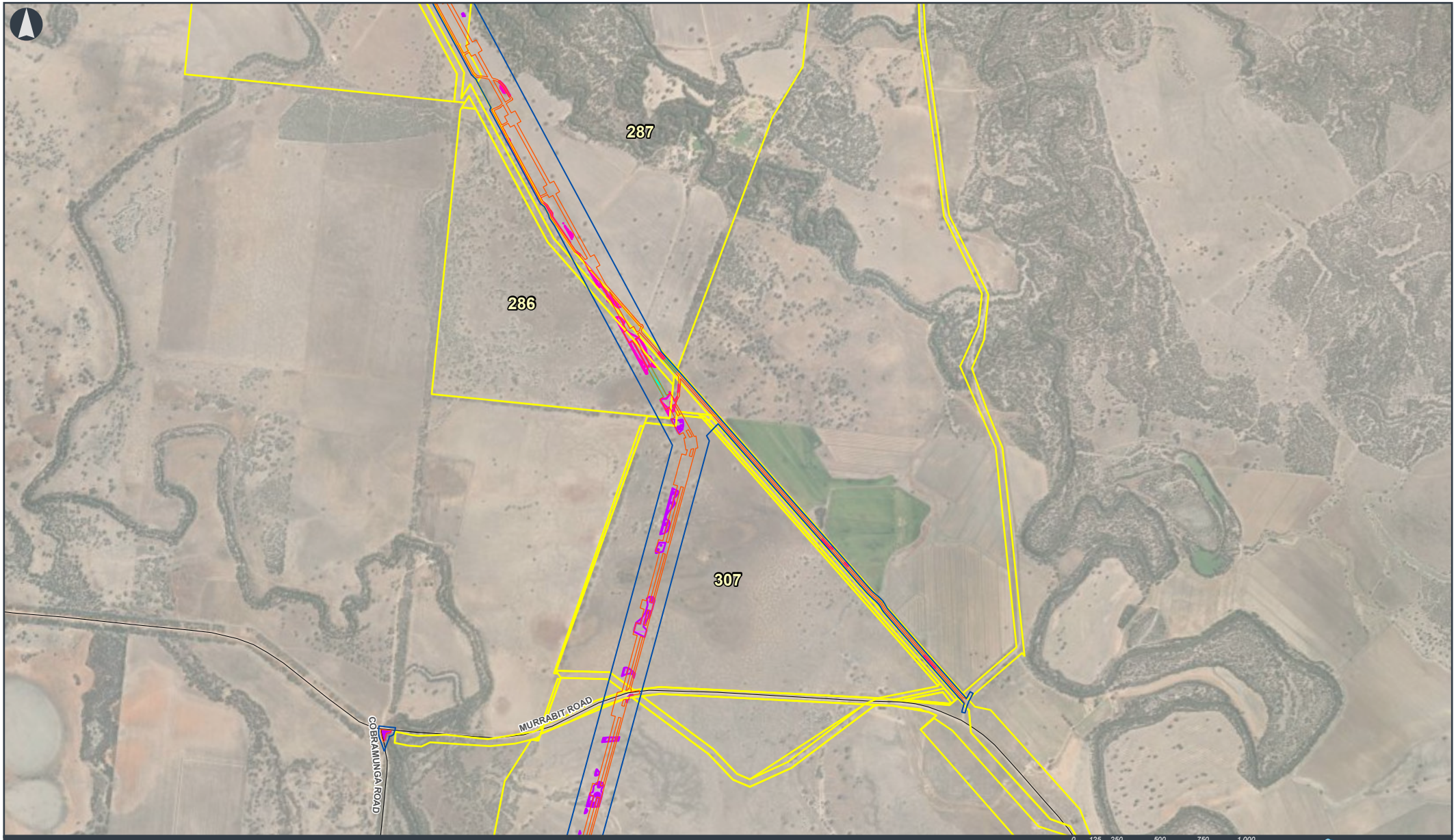
Figure P4.1
Candidate threatened flora species within the restricted access holdings
Page 2 of 11

Legend

- Main road
- Amended project footprint
- Subject land
- Property with restricted access

Assumed flora species polygons

- *Eleocharis obicis*



VNI West – BDAR

Figure P4.1
Candidate threatened flora species within the restricted access holdings
Page 3 of 11

Legend

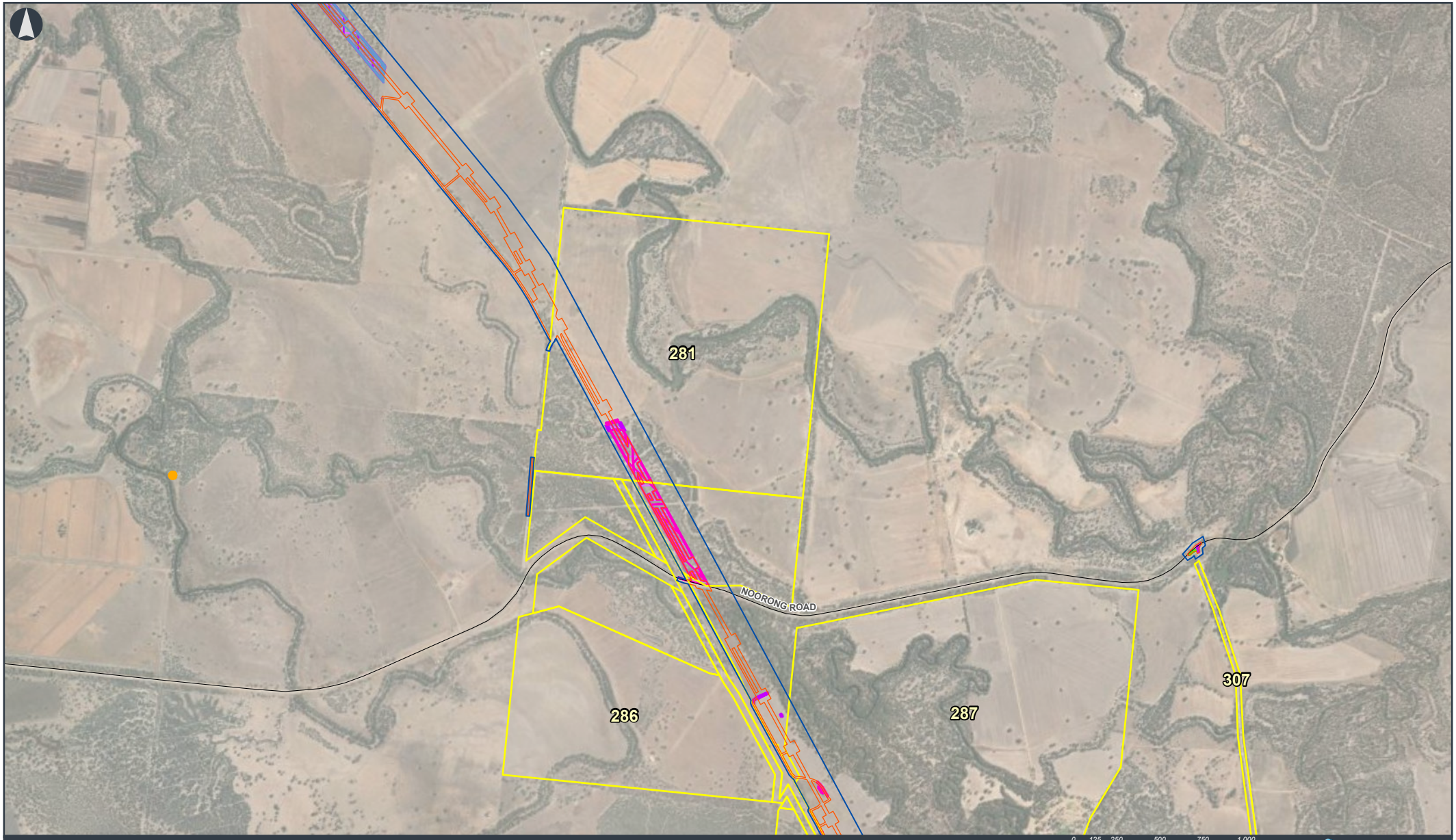
- Main road
- Named waterway
- Amended project footprint
- Subject land
- Property with restricted access

Assumed flora species polygons

- *Austrostipa wakoolica*
- *Eleocharis obicis*
- *Eucalyptus leucoxylon subsp. pruinosa*
- *Lepidium monoplocoides*
- *Pilularia novae-hollandiae*

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Data sources: NSW EPI, DELWP, WSP, EnergyConnect



VNI West – BDAR

Figure P4.1
Candidate threatened flora species within the restricted access holdings
Page 4 of 11

Legend

- Main road
- Amended project footprint
- Subject land
- Property with restricted access

BioNet flora records

- *Austrostipa wakoolica*

Assumed flora species polygons

- *Eleocharis obicis*
- *Eucalyptus leucoxylon subsp. pruinosa*
- *Lepidium monoplocoides*
- *Maireana cheelii*
- *Pilularia novae-hollandiae*
- *Prasophyllum sp. moama*
- *Pterostylis despectans*
- *Swainsona sericea*

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Data sources: NSW EPI, DELWP, WSP, EnergyConnect



VNI West – BDAR

Figure P4.1
Candidate threatened flora species within the restricted access holdings
Page 5 of 11

Legend

- Main road
- Amended project footprint
- Subject land
- Property with restricted access

Assumed flora species polygons

- *Eleocharis obicis*
- *Eucalyptus leucoxylon subsp. pruinosa*
- *Lepidium monoplocoides*
- *Pilularia novae-hollandiae*

Data sources: NSW EPI, DELWP, WSP, EnergyConnect



VNI West – BDAR

Figure P4.1
Candidate threatened flora species within the restricted access holdings
Page 6 of 11

Legend

- Main road
- Amended project footprint
- Subject land
- Property with restricted access

BioNet flora records

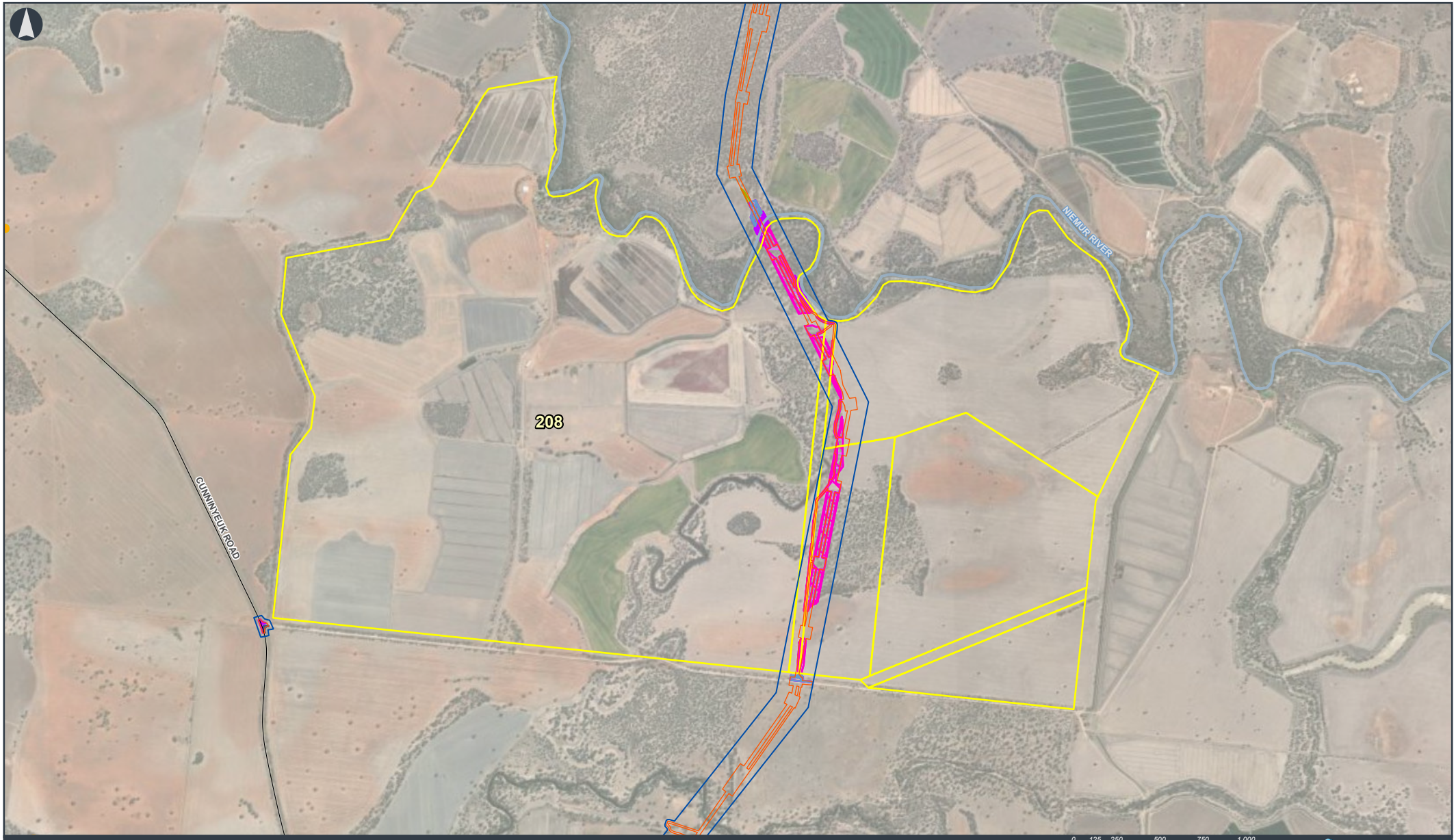
- *Austrostipa metatoris*

Assumed flora species polygons

- *Eleocharis obicis*
- *Eucalyptus leucoxylon subsp. pruinosa*
- *Lepidium monoplocoides*
- *Pilularia novae-hollandiae*

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Data sources: NSW EPI, DELWP, WSP, EnergyConnect



VNI West – BDAR

Figure P4.1
Candidate threatened flora species within the restricted access holdings
Page 7 of 11

Legend

- Main road
- Named waterway
- Amended project footprint
- Subject land
- Property with restricted access

BioNet flora records

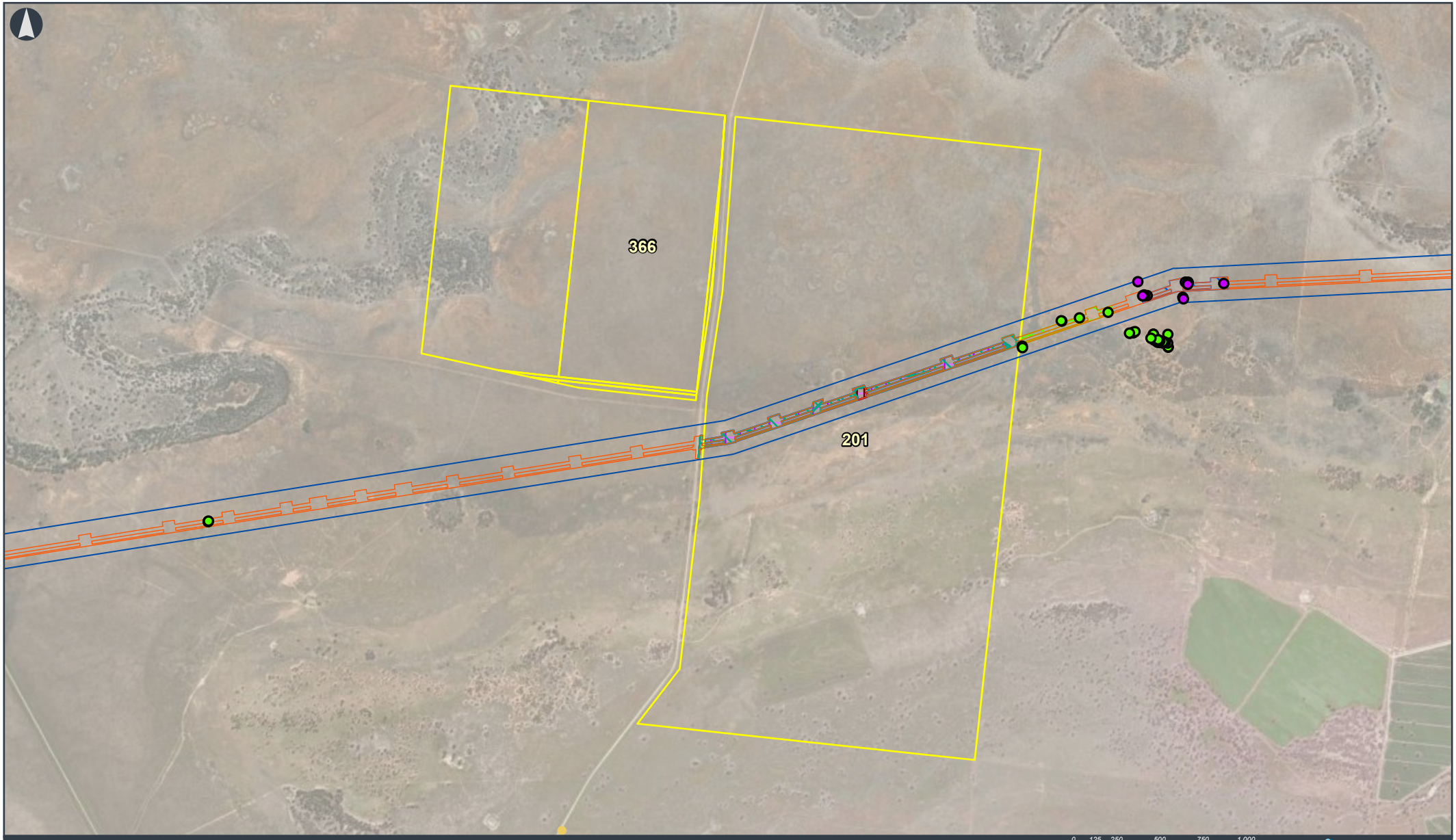
- *Austrostipa metatoris*
- *Austrostipa wakoolica*

Assumed flora species polygons

- *Amphibromus fluitans*
- *Austrostipa metatoris*
- *Austrostipa wakoolica*
- *Eleocharis obicis*
- *Eucalyptus leucoxylon subsp. pruinosa*
- *Lepidium monoplocoides*
- *Pilularia novae-hollandiae*
- *Pterostylis despectans*

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Data sources: NSW EPI, DELWP, WSP, EnergyConnect



VNI West – BDAR

Figure P4.1
Candidate threatened flora species within the restricted access holdings
Page 8 of 11

Legend

- Amended project footprint
- Subject land
- Property with restricted access

BioNet flora records

- *Brachyscome papillosa*

Threatened flora species (WSP)

- *Brachyscome papillosa*
- *Lepidium monoplocoides*
- *Maireana cheelii*

Confirmed flora species polygons

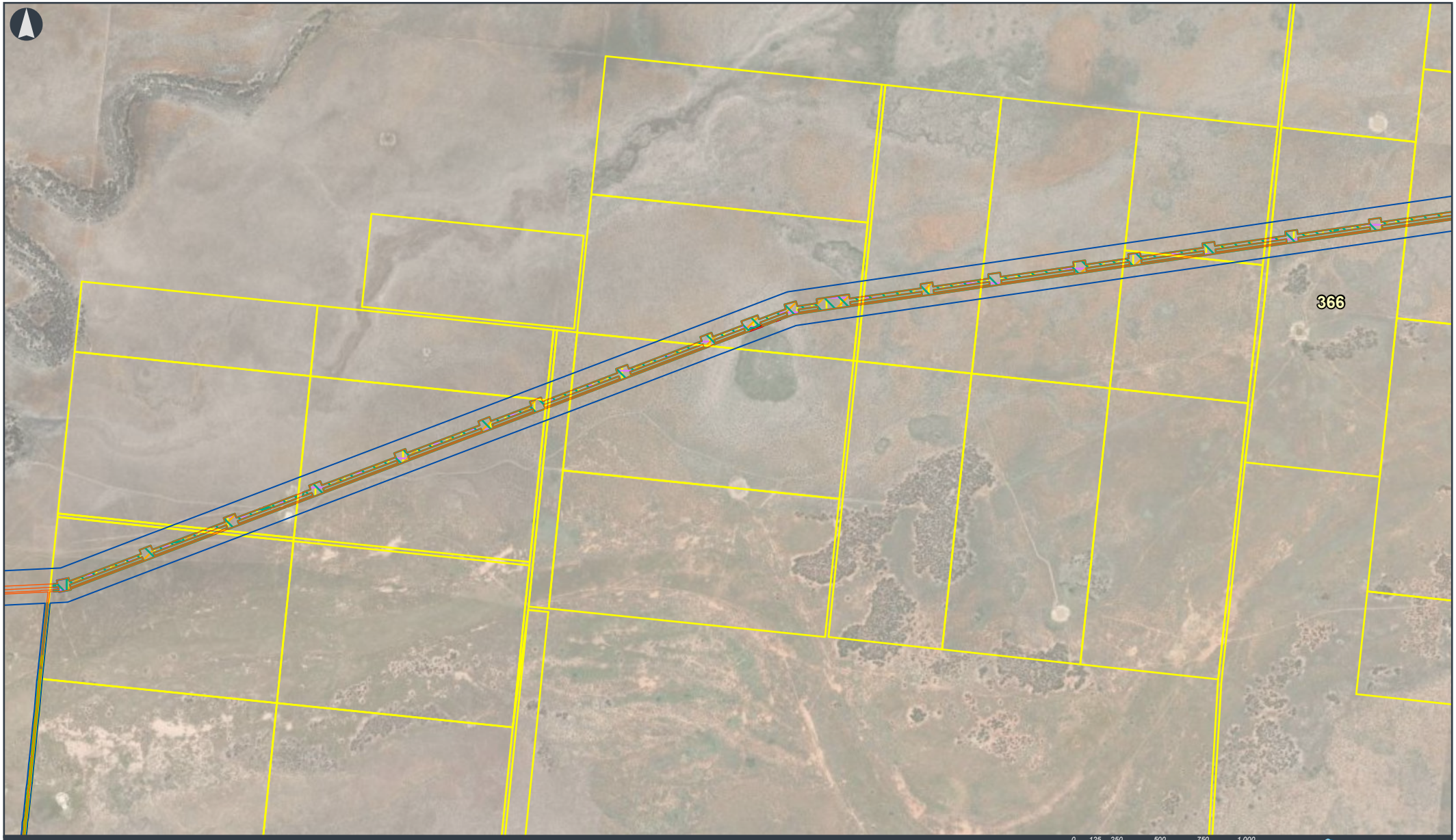
- *Brachyscome papillosa*
- *Maireana cheelii*

Assumed flora species polygons

- *Brachyscome papillosa*
- *Calotis moorei*
- *Convolvulus tedmoorei*
- *Eleocharis obicis*
- *Lepidium monoplocoides*
- *Maireana cheelii*
- *Solanum karsense*
- *Swainsona murrayana*
- *Swainsona sericea*

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Data sources: NSW EPI, DELWP, WSP, EnergyConnect



VNI West – BDAR

Figure P4.1
Candidate threatened flora species within the restricted access holdings
Page 9 of 11

Legend

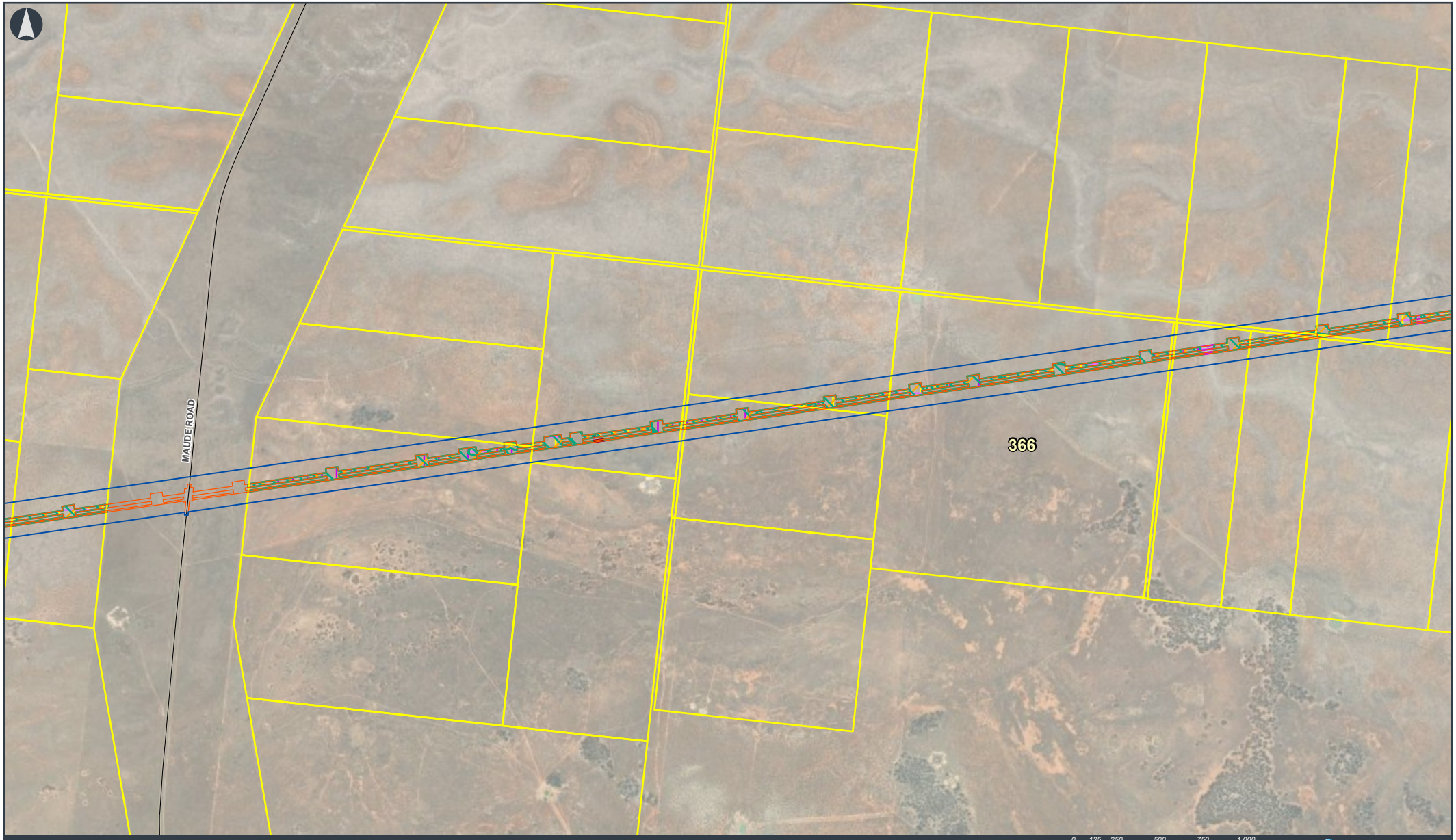
- Amended project footprint
- Subject land
- Property with restricted access

Assumed flora species polygons

- *Austrostipa wakoolica*
- *Brachyscome papillosa*
- *Eleocharis obicis*
- *Lepidium monoplocoides*
- *Leptorhynchos orientalis*
- *Maireana cheelii*
- *Sclerolaena napiformis*
- *Solanum karsense*
- *Swainsona murrayana*
- *Swainsona plagiotropis*
- *Swainsona sericea*

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Data sources: NSW EPI, DELWP, WSP, EnergyConnect



wsp

VNI West – BDAR

Figure P4.1
Candidate threatened flora species within the restricted access holdings
Page 10 of 11

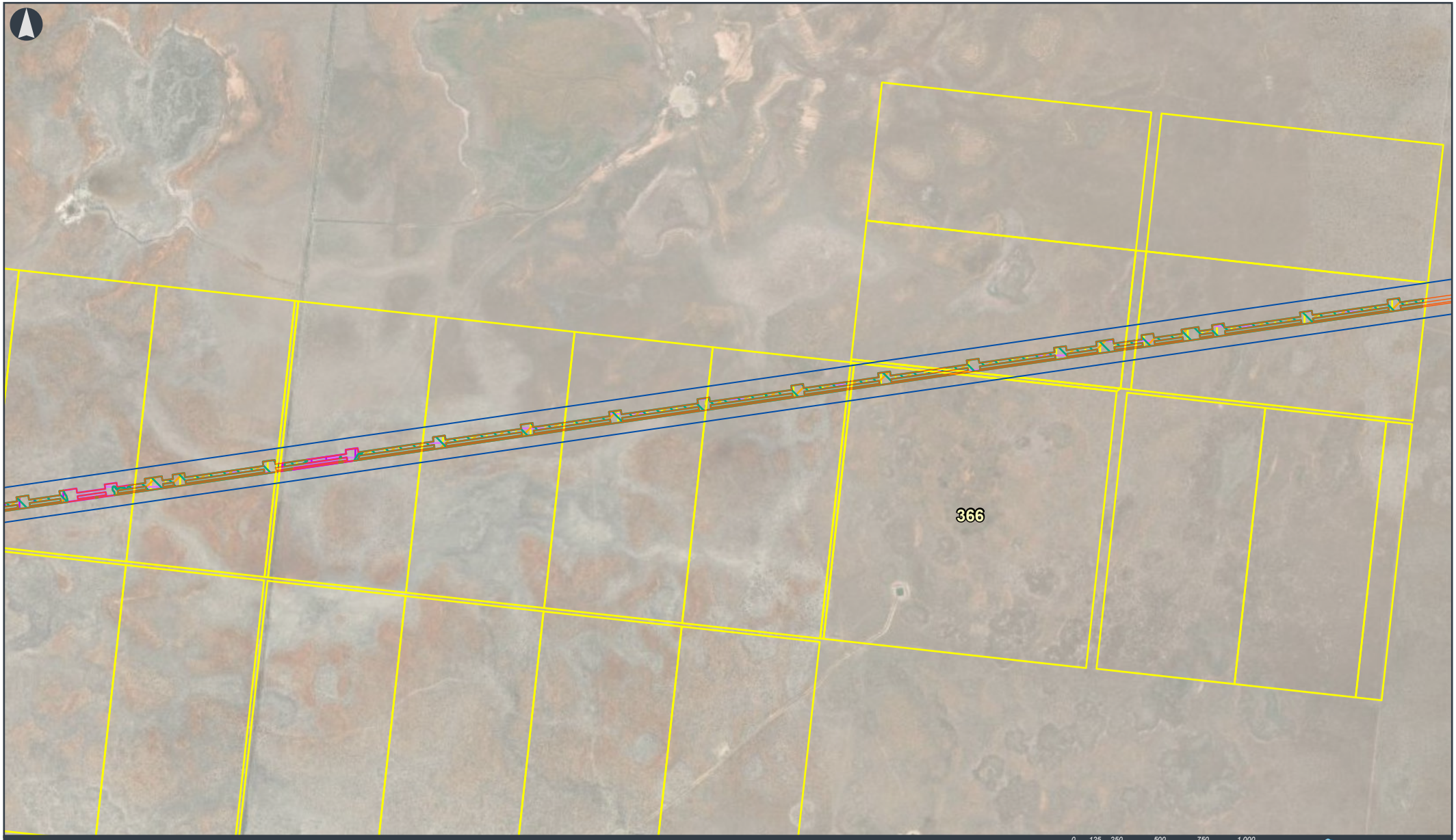
Legend

- Main road
- Amended project footprint
- Subject land
- Property with restricted access

Assumed flora species polygons

- *Brachyscome papillosa*
- *Eleocharis obicis*
- *Lepidium monoplocoides*
- *Leptorhynchos orientalis*
- *Maireana cheelii*
- *Sclerolaena napiformis*
- *Solanum karsense*
- *Swainsona murrayana*
- *Swainsona plagiotropis*
- *Swainsona sericea*

Data sources: NSW EPI, DELWP, WSP, EnergyConnect



VNI West – BDAR

Figure P4.1
Candidate threatened flora species within the restricted access holdings
Page 11 of 11

Legend

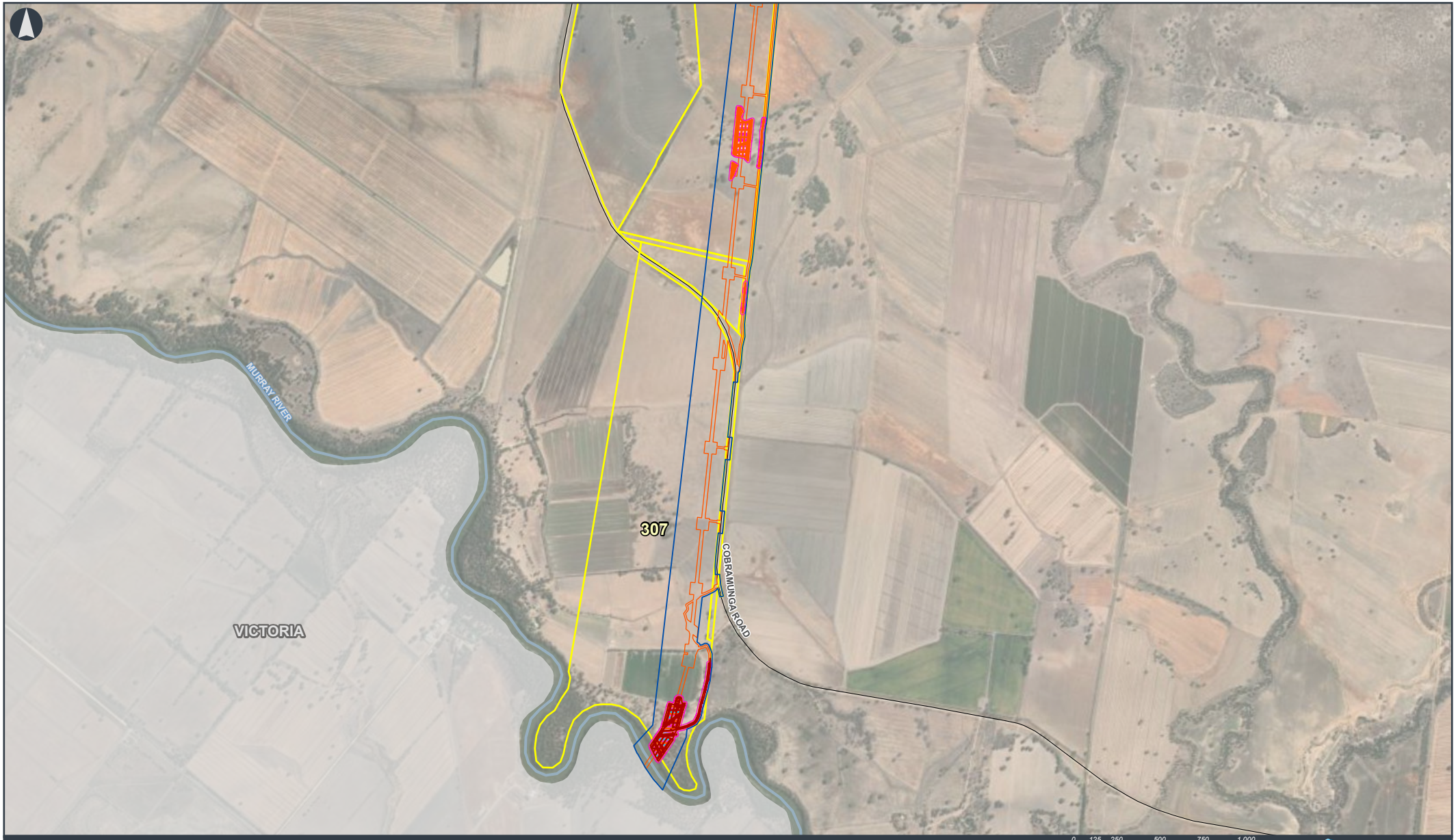
- Amended project footprint
- Subject land
- Property with restricted access

Assumed flora species polygons

- *Brachyscome papillosa*
- *Eleocharis obicis*
- *Lepidium monoplocoides*
- *Maireana cheelii*
- *Swainsona murrayana*

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Data sources: NSW EPI, DELWP, WSP, EnergyConnect



VNI West – BDAR

Figure P4.2
Candidate threatened fauna species within the restricted access holdings
Page 1 of 11

Legend

- Main road
- Named waterway
- Amended project footprint
- Subject land
- Property with restricted access

Assumed fauna species polygons

- Black-breasted Buzzard
- Koala
- Little Eagle
- Pink Cockatoo
- Southern Myotis
- Square-tailed Kite
- White-bellied sea eagle

Data sources: NSW EPI, DELWP, WSP, EnergyConnect



wsp

VNI West – BDAR

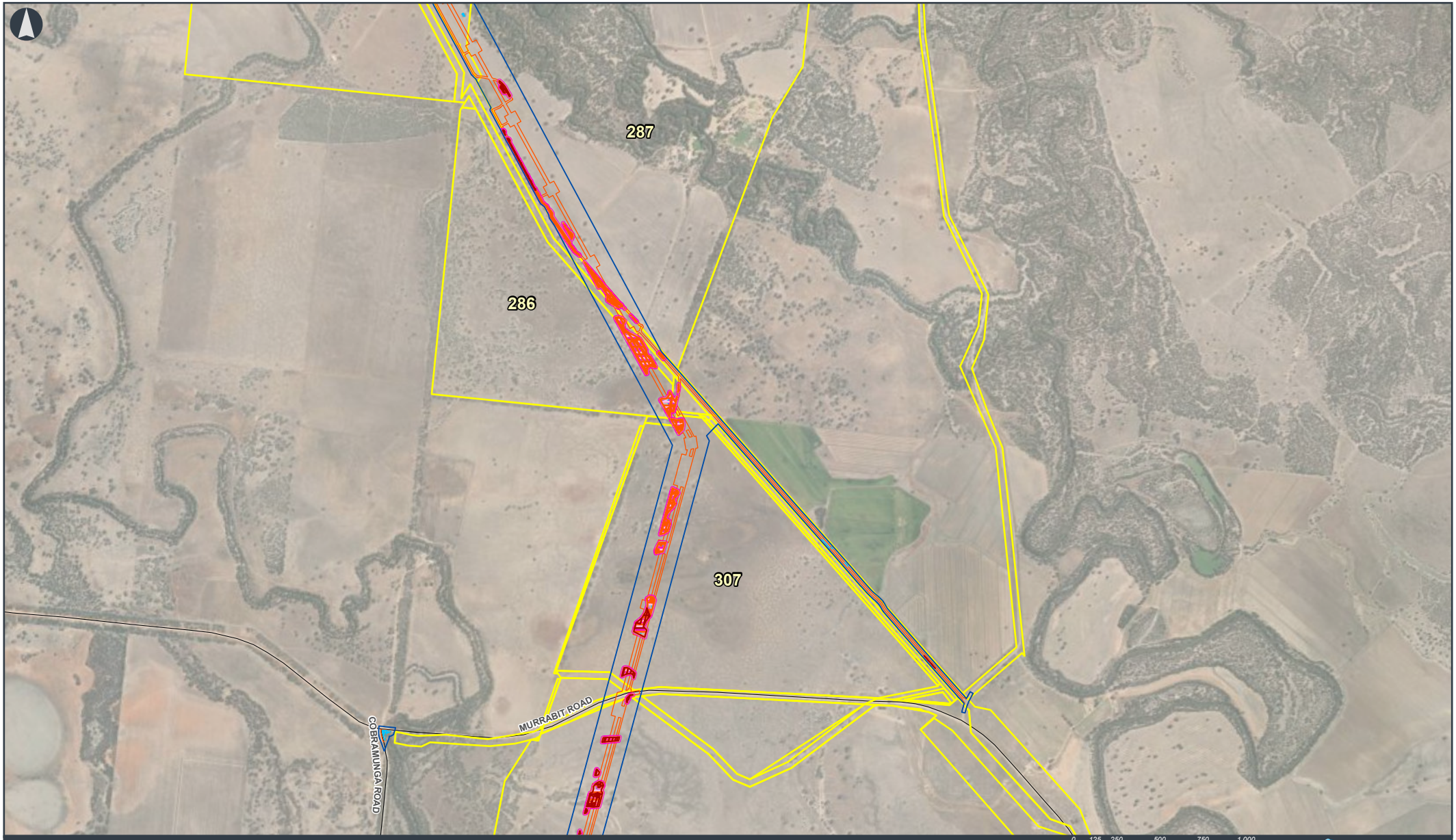
Figure P4.2
Candidate threatened fauna species within the restricted access holdings
Page 2 of 11

Legend

- Main road
- Amended project footprint
- Subject land
- Property with restricted access

Assumed fauna species polygons

- Black-breasted Buzzard
- Koala
- Little Eagle
- Pink Cockatoo
- Square-tailed Kite
- White-bellied sea eagle



VNI West – BDAR

Figure P4.2
Candidate threatened fauna species within the restricted access holdings
Page 3 of 11

Legend

- Main road
- Named waterway
- Amended project footprint
- Subject land
- Property with restricted access

Assumed fauna species polygons

- Bush Stone-curlew
- Koala
- Little Eagle
- Pink Cockatoo
- Square-tailed Kite
- White-bellied sea eagle

Data sources: NSW EPI, DELWP, WSP, EnergyConnect



VNI West – BDAR

Figure P4.2
Candidate threatened fauna species within the restricted access holdings
Page 4 of 11

Legend

- Main road
- Amended project footprint
- Subject land
- Property with restricted access

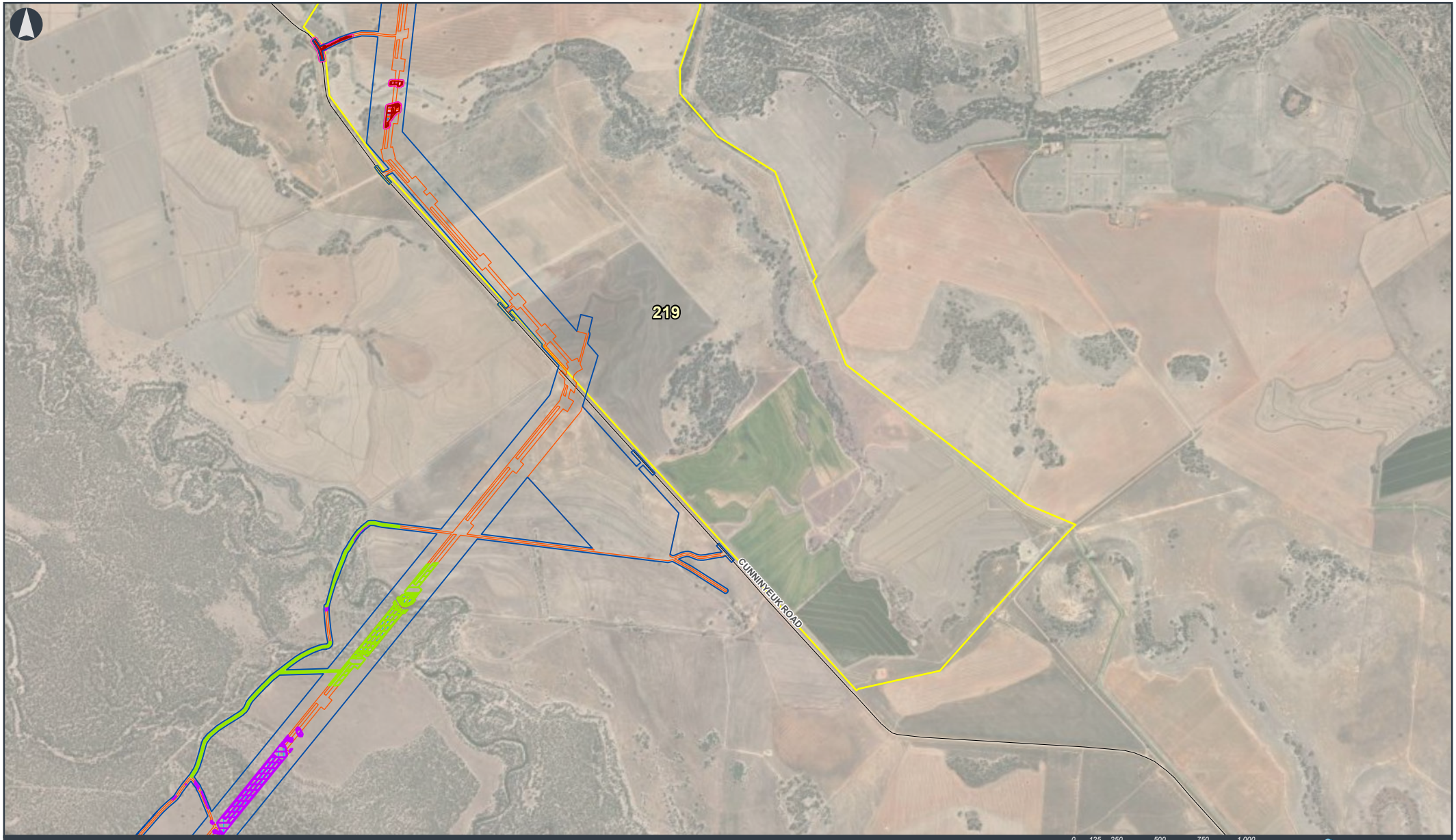
Confirmed fauna species polygons

- Bush Stone-curlew
- Southern Myotis

Assumed fauna species polygons

- Bush Stone-curlew
- Koala
- Little Eagle
- Pink Cockatoo
- Sloane's froglet
- Southern Bell Frog
- Square-tailed Kite
- White-bellied sea eagle

Data sources: NSW EPI, DELWP, WSP, EnergyConnect



VNI West – BDAR

Figure P4.2
Candidate threatened fauna species within the restricted access holdings
Page 5 of 11

Legend

- Main road
- Amended project footprint
- Subject land
- Property with restricted access

Confirmed fauna species polygons

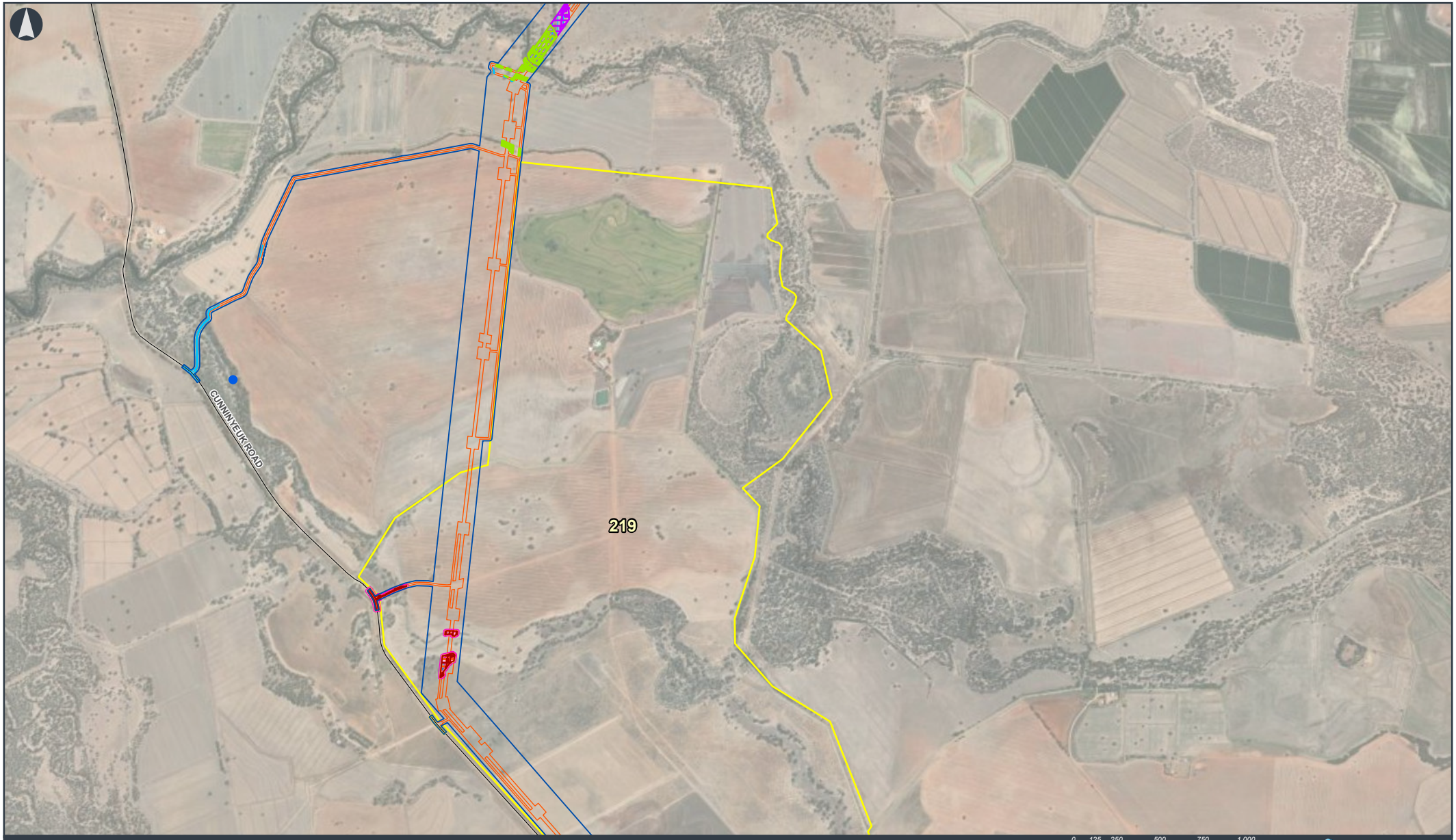
- Bush Stone-curlew
- Southern Bell Frog

Assumed fauna species polygons

- Black-breasted Buzzard
- Koala
- Little Eagle
- Pink Cockatoo
- Square-tailed Kite
- White-bellied sea eagle

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Data sources: NSW EPI, DELWP, WSP, EnergyConnect



VNI West – BDAR

Figure P4.2
Candidate threatened fauna species within the restricted access holdings
Page 6 of 11

Legend

- Main road
- Amended project footprint
- Subject land
- Property with restricted access

BioNet fauna records

- Southern Bell Frog

Confirmed fauna species polygons

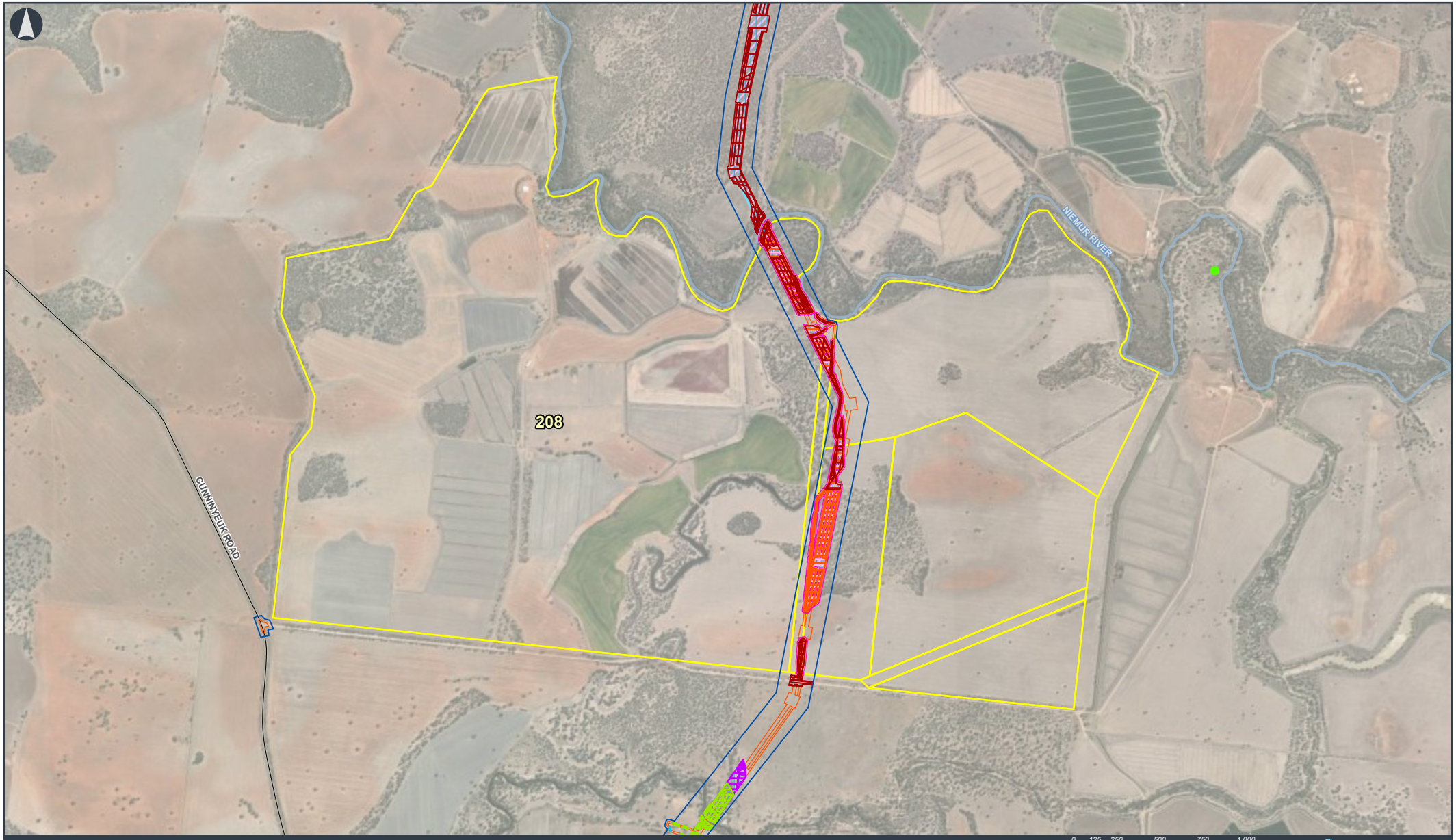
- Bush Stone-curlew
- Southern Bell Frog

Assumed fauna species polygons

- Black-breasted Buzzard
- Koala
- Little Eagle
- Pink Cockatoo
- Square-tailed Kite
- White-bellied sea eagle

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Data sources: NSW EPI, DELWP, WSP, EnergyConnect



VNI West – BDAR

Figure P4.2
Candidate threatened fauna species within the restricted access holdings
Page 7 of 11

Legend

- Main road
- Named waterway
- Amended project footprint
- Subject land
- Property with restricted access

BioNet fauna records

- Bush Stone-curlew

Confirmed fauna species polygons

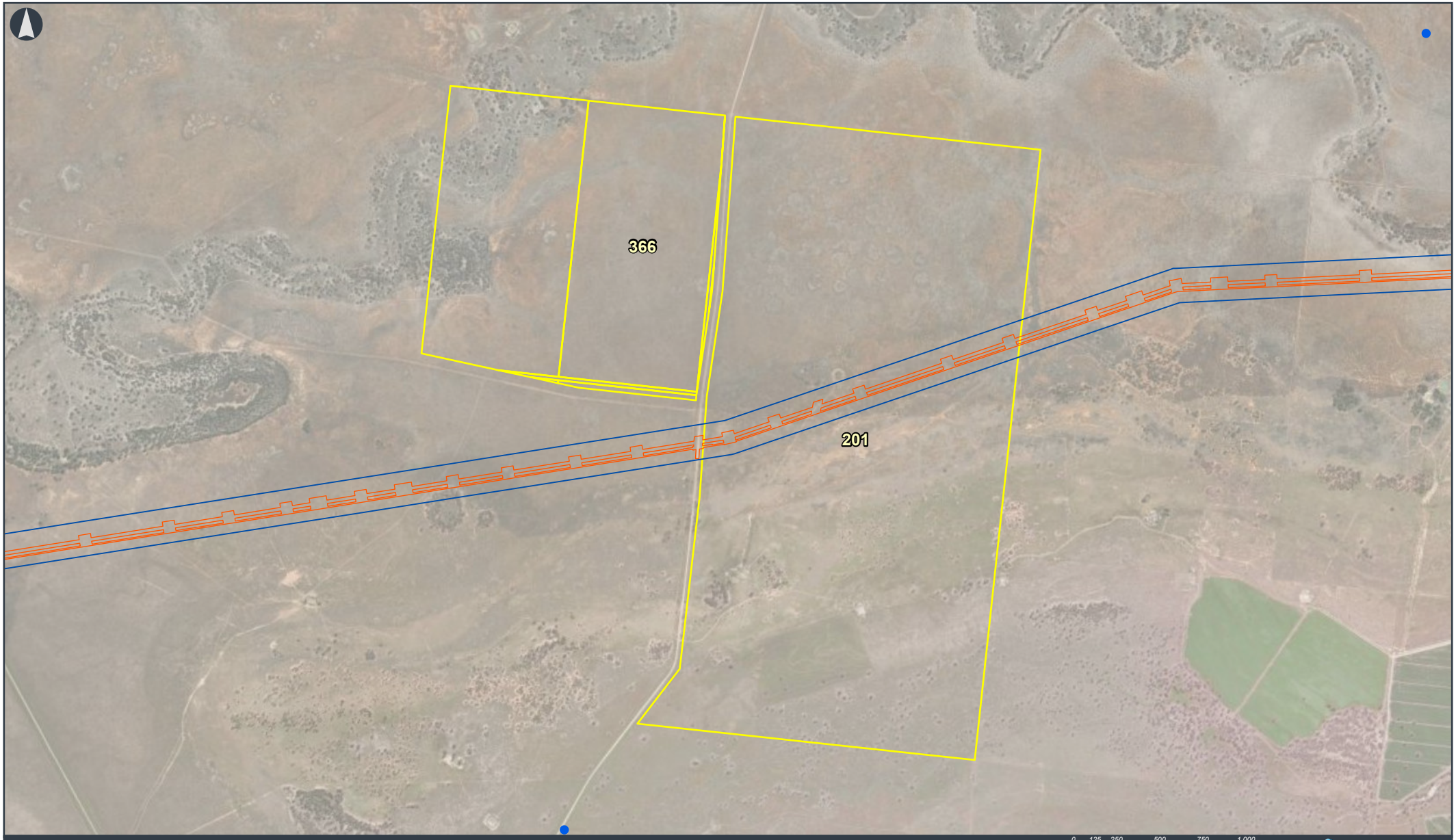
- Bush Stone-curlew
- Southern Bell Frog

Assumed fauna species polygons

- Black-breasted Buzzard
- Bush Stone-curlew
- Koala
- Little Eagle
- Pink Cockatoo
- Southern Myotis
- Square-tailed Kite
- White-bellied sea eagle

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Data sources: NSW EPI, DELWP, WSP, EnergyConnect



VNI West – BDAR

Figure P4.2
Candidate threatened fauna species within the restricted access holdings
Page 8 of 11

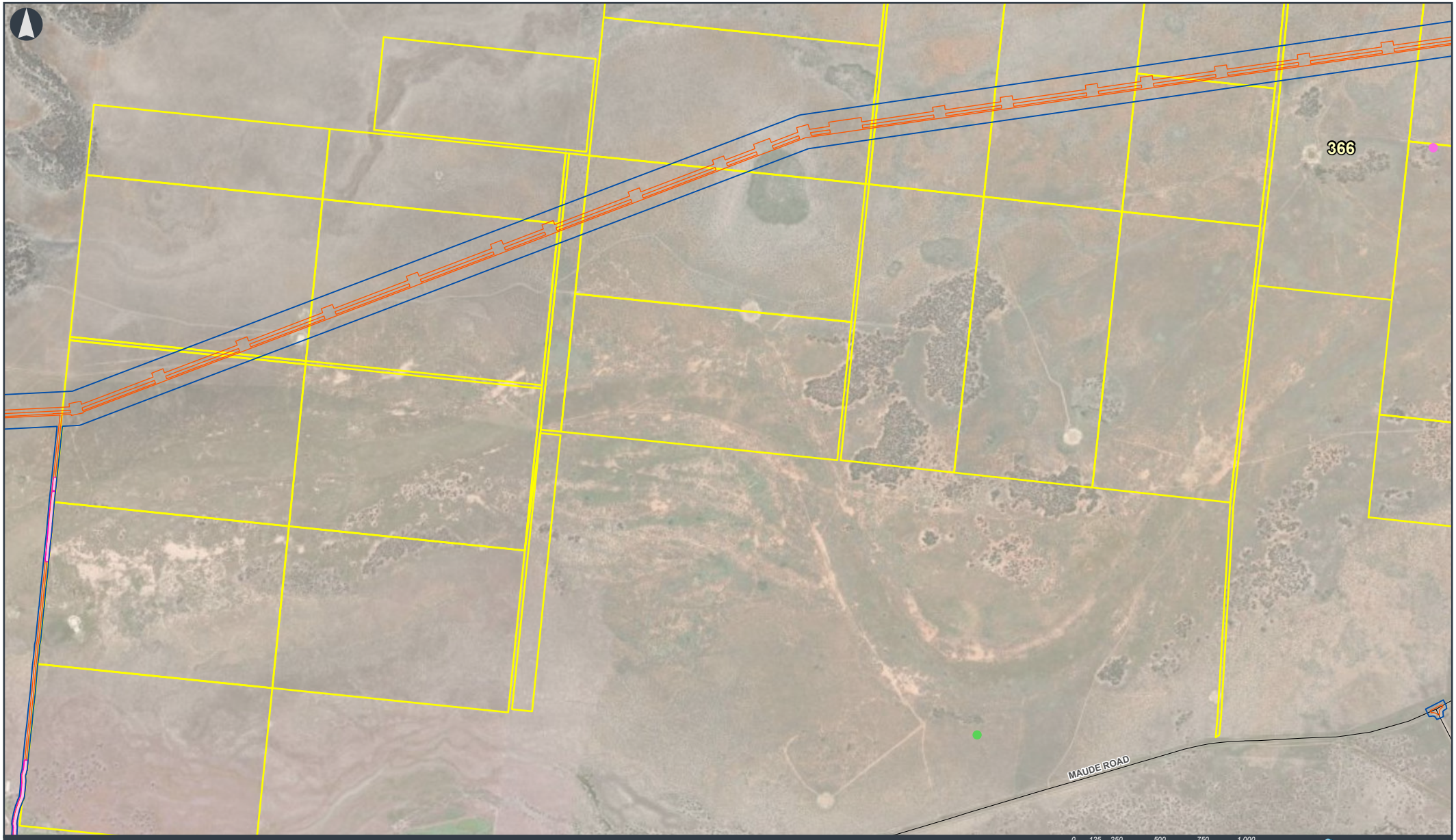
Legend

- Amended project footprint
- Subject land
- Property with restricted access

BioNet fauna records

- Southern Bell Frog

Data sources: NSW EPI, DELWP, WSP, EnergyConnect



VNI West – BDAR

Figure P4.2
Candidate threatened fauna species within the restricted access holdings
Page 9 of 11

Legend

- Main road
- Amended project footprint
- Subject land
- Property with restricted access

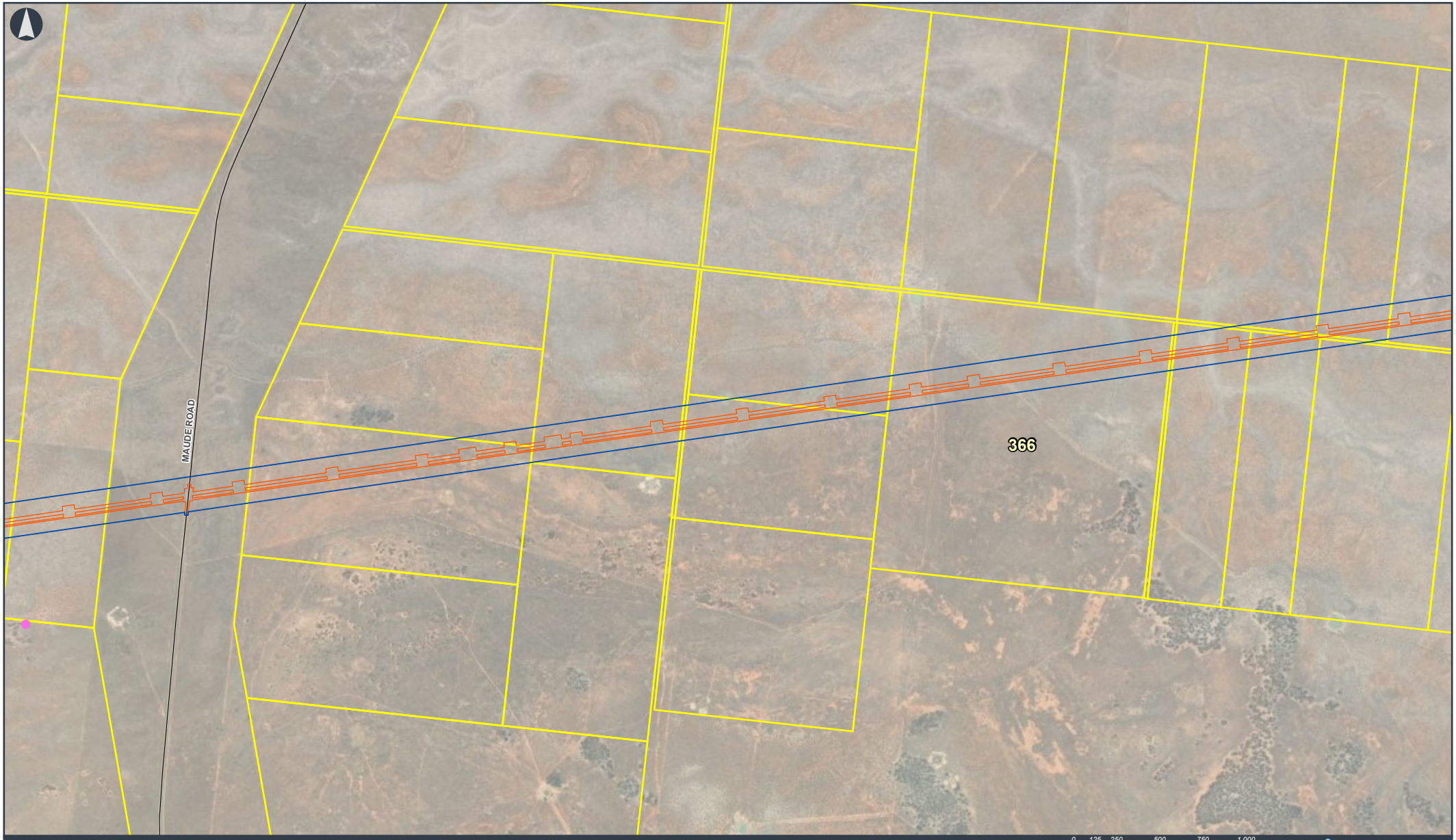
BioNet fauna records

- Pink Cockatoo
- Plains-wanderer

Assumed fauna species polygons

- Little Eagle
- Pink Cockatoo

Data sources: NSW EPI, DELWP, WSP, EnergyConnect



VNI West – BDAR

Figure P4.2
Candidate threatened fauna species within the restricted access holdings

Legend

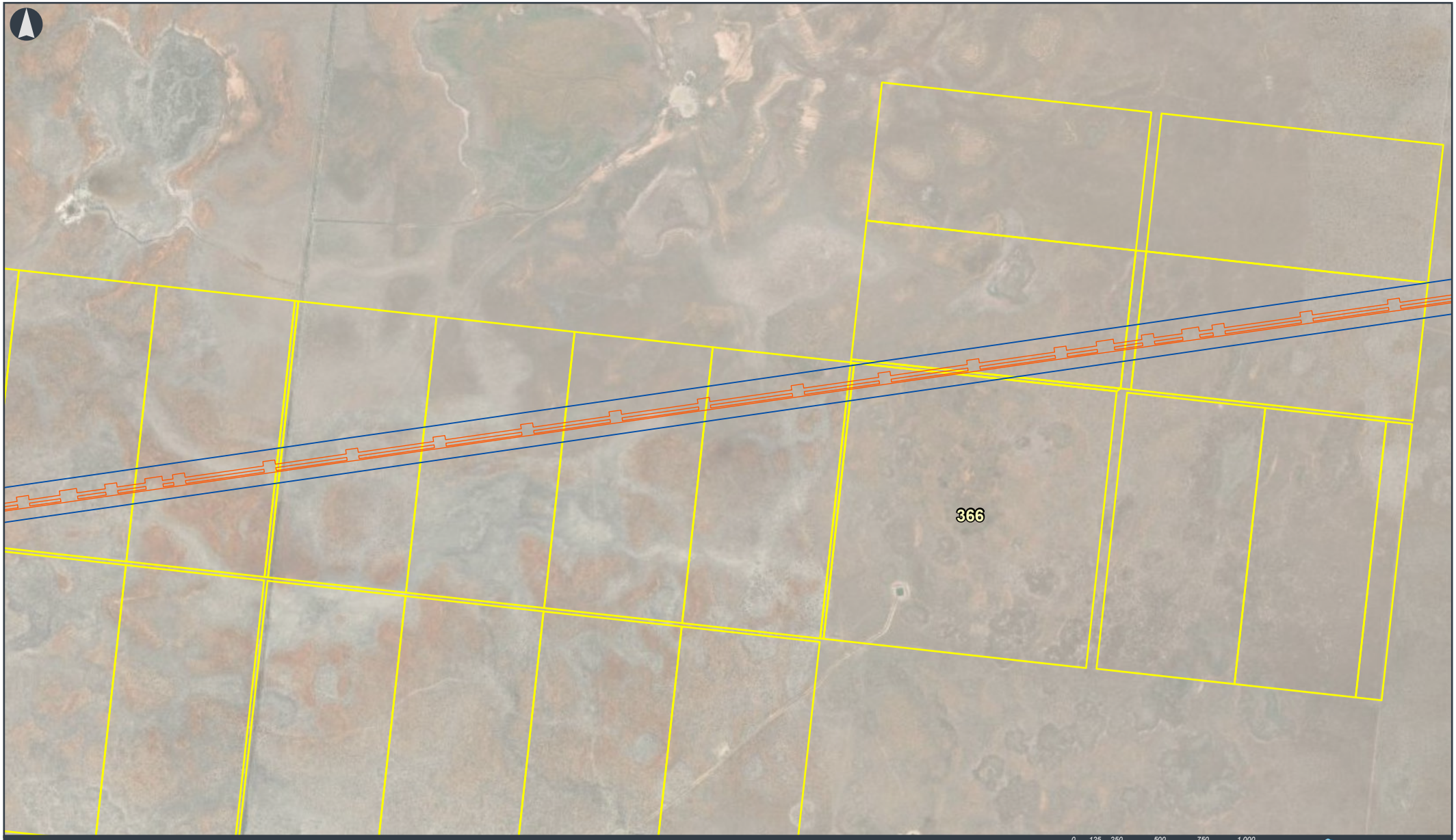
- Main road
- Amended project footprint
- Subject land
- Property with restricted access

BioNet fauna records

- Pink Cockatoo

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Data sources: NSW EPI, DELWP, WSP, EnergyConnect



VNI West – BDAR

Figure P4.2
Candidate threatened fauna species within the restricted access holdings
Page 11 of 11

Legend

- Amended project footprint
- Subject land
- Property with restricted access

U:\ProjectsAU\PS138xxx\PS138962_VNI_West_EIS_NSW\4_WIP\GIS\00_ArcGIS\Pro\99_Misc\Remote_Access\250603_RemoteWork_Working.aprx | PS138962_ECO_EIS_F04_2_ThreatenedFaunaSpecies_250728_r2v1 | Author: L.Roos | QA: E.Buxton

Data sources: NSW EPI, DELWP, WSP, EnergyConnect

P5. Conclusion

There are eight restricted-access holdings within the project where the remote access guidelines are applicable to assess the impacts on native vegetation, candidate flora and fauna in accordance with the BAM. The eight restricted holdings are described and assessed by desktop analysis using multiple sources of information to inform the vegetation mapping to represent the potential habitat for candidate flora and fauna.

Assumed presence on restricted-access holdings for nine candidate threatened flora has been retained, or partially retained, where the species has been identified within a surrogate site or is known to occur within 5 km of the restricted-access holding. Assumed presence has been retained for one additional species where adequate survey effort on surrogate sites was not completed and the species cannot be ruled out.

While survey effort undertaken within the surrogate sites demonstrates a significant representative of coverage for all other species retained for exclusion under the guide, with most species having greater than 70% of the like for like habitat surveyed within Murrumbidgee IBRA subregion and 50% of the like for like habitat surveyed within the Murray Fans IBRA subregion. Ten candidate threatened flora species with habitat within both the restricted-access holdings and surrogate sites were assessed and excluded from the assessment through surrogate survey in accordance with the guide.

A total of four candidate threatened fauna species with habitat within both the restricted-access holdings and surrogate sites were assessed and excluded within the restricted-access holdings through surrogate survey in accordance with the guide. These threatened fauna species were excluded as the associated habitat coverage within the surrogate survey areas represents greater than 60% of the representative like for like habitat within each IBRA subregion.

Yours sincerely



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Appendix A BAM VI plot survey effort summary

Table A.1 BAM VI plot survey effort undertaken within surrogate sites that has been applied to restricted-access holdings

IBRA subregion	Holding	PCT	Condition class	Area (ha) - restricted-access holdings	Minimum plot requirement for restricted-access holding	BAM VI plots from surrogate sites applied to the restricted-access holding	VI score
Murrumbidgee	H201	PCT 23	Derived	1.42	1	VNI_OZ17 VNI_DR65 VNIOZ_16	33.2
		PCT 157	Moderate-good	0.22	1	VNI_DR09 VNI_DR26 VNI_DR40 VNI_DR49 VNI_DR52 VNI_MP23 VNI_NM06	90
		PCT 160	Moderate-good	0.49	1	VNI_DR12 VNI_DR35 VNI_DR38 VNI_MP17 VNIOZ_15	88.7

IBRA subregion	Holding	PCT	Condition class	Area (ha) - restricted-access holdings	Minimum plot requirement for restricted-access holding	BAM VI plots from surrogate sites applied to the restricted-access holding	VI score
		PCT 163	Moderate-good	35.79	4	VNI_NM07 VNI_DR106 VNI_DR13 VNI_DR39 VNI_DR50 VNI_DR51 VNIOZ_14 VNI_DR25	97.7
		PCT 164	Moderate-good	0.17	1	VNI_DR11 VNI_DR31 VNI_DR33 VNI_DR37 VNI_MP03 VNI_MP04 VNIOZ_02 VNIOZ_04	86.9

IBRA subregion	Holding	PCT	Condition class	Area (ha) - restricted-access holdings	Minimum plot requirement for restricted-access holding	BAM VI plots from surrogate sites applied to the restricted-access holding	VI score
	H366	PCT 15	Moderate-good	0.23	1	VNI_DR04 VNI_DR54 VNI_DR68 VNI_DR69 VNI_DR70 VNI_DR71 VNI_DR72 VNIOZ_08	70.6
		PCT 17	Moderate-good	12.29	3	VNI_DR15 VNI_DR81 VNI_OZ34	84.7
		PCT 46	Moderate-good	70.25	5	VNI_DR10 VNI_DR64 VNI_DR88 VNIOZ_11	91.4

IBRA subregion	Holding	PCT	Condition class	Area (ha) - restricted-access holdings	Minimum plot requirement for restricted-access holding	BAM VI plots from surrogate sites applied to the restricted-access holding	VI score
		PCT 157	Moderate-good	19.55	3	VNI_DR09 VNI_DR26 VNI_DR40 VNI_DR49 VNI_DR52 VNI_MP23 VNI_NM06	90
		PCT 160	Moderate-good	9.04	3	VNI_DR12 VNI_DR35 VNI_DR38 VNI_MP17 VNIOZ_15	88.7
		PCT 163	Moderate-good	1.64	1	VNI_NM07 VNI_DR106 VNI_DR13 VNI_DR39 VNI_DR50 VNI_DR51 VNIOZ_14 VNI_DR25	97.7

IBRA subregion	Holding	PCT	Condition class	Area (ha) - restricted-access holdings	Minimum plot requirement for restricted-access holding	BAM VI plots from surrogate sites applied to the restricted-access holding	VI score
		PCT 164	Moderate-good	368.98	7	VNI_DR11 VNI_DR31 VNI_DR33 VNI_DR37 VNI_MP03 VNI_MP04 VNIOZ_02 VNIOZ_04	86.9
		PCT 166	Moderate-good	0.33	1	Benchmark condition applied	100
Murray Fans	H208	PCT 10	Thinned	1.85	1	VNI_MP52 VNI_MP41 VNI_MP42 VNI_MP33	33.5
		PCT 13	Derived – No Offset	4.20	2	VNI_MP05 VNI_MP06 VNI_NM01 VNI_MP34 VNI_NM025	12.6

IBRA subregion	Holding	PCT	Condition class	Area (ha) - restricted-access holdings	Minimum plot requirement for restricted-access holding	BAM VI plots from surrogate sites applied to the restricted-access holding	VI score
			Moderate-good	30.59	4	VNI_DR16 VNI_DR19 VNI_MP32 VNI_NM038 VNI_NM039	56.2
	H219	PCT 13	Derived – No Offset	17.22	3	VNI_MP05 VNI_MP06 VNI_NM01 VNI_MP34 VNI_NM025	12.6
			Moderate-good	3.27	2	VNI_DR16 VNI_DR19 VNI_MP32 VNI_NM038 VNI_NM039	56.2
		PCT 163	Moderate-good	0.23	1	VNI_MP38 VNI_MP43 VNI_MP44 VNI_NM027 VNI_NM031	83.2

IBRA subregion	Holding	PCT	Condition class	Area (ha) - restricted-access holdings	Minimum plot requirement for restricted-access holding	BAM VI plots from surrogate sites applied to the restricted-access holding	VI score
	H281	PCT 10	Thinned	1.66	1	VNI_MP52 VNI_MP41 VNI_MP42 VNI_MP33	33.5
		PCT 13	Derived – No Offset	0.06	1	VNI_MP05 VNI_MP06 VNI_NM01 VNI_MP34 VNI_NM025	12.6
			Moderate-good	20.72	4	VNI_DR16 VNI_DR19 VNI_MP32 VNI_NM038 VNI_NM039	56.2
	H286	PCT 13	Derived – No offset	4.53	2	VNI_MP05 VNI_MP06 VNI_NM01 VNI_MP34 VNI_NM025	12.6

IBRA subregion	Holding	PCT	Condition class	Area (ha) - restricted-access holdings	Minimum plot requirement for restricted-access holding	BAM VI plots from surrogate sites applied to the restricted-access holding	VI score
			Moderate-good	8.17	3	VNI_DR16 VNI_DR19 VNI_MP32 VNI_NM038 VNI_NM039	56.2
		PCT 28	Derived	3.47	2	VNI_NM030	6.1
		PCT 216	Moderate-good	0.02	1	VNI_NM036	75.3
	H287	PCT 7	Moderate-good	0.05	1	VNI_DR20 VNI_DR46 VNI_DR93 VNI_NM033 VNI_NM037	74.7
		PCT 10	Thinned	1.49	1	VNI_MP52 VNI_MP41 VNI_MP42 VNI_MP33	33.5

IBRA subregion	Holding	PCT	Condition class	Area (ha) - restricted-access holdings	Minimum plot requirement for restricted-access holding	BAM VI plots from surrogate sites applied to the restricted-access holding	VI score
		PCT 13	Derived – No Offset	1.92	1	VNI_MP05 VNI_MP06 VNI_NM01 VNI_MP34 VNI_NM025	12.6
			Moderate-good	1.78	1	VNI_DR16 VNI_DR19 VNI_MP32 VNI_NM038 VNI_NM039	56.2
	H307 (WSP field verified)	PCT 7	Moderate-good	3.24	2	VNI_DR20 VNI_DR46 VNI_DR93 VNI_NM033 VNI_NM037	74.7
		PCT 10	Derived – No Offset	60.40	5	VNI_MP52 VNI_MP41 VNI_MP42 VNI_MP33	4.7

IBRA subregion	Holding	PCT	Condition class	Area (ha) - restricted-access holdings	Minimum plot requirement for restricted-access holding	BAM VI plots from surrogate sites applied to the restricted-access holding	VI score
			Thinned	26.55	4	VNI_MP52 VNI_MP41 VNI_MP42 VNI_MP33	33.5
		PCT 13	Derived – No Offset	56.07	5	VNI_MP05 VNI_MP06 VNI_NM01 VNI_MP34 VNI_NM025	12.6
			Moderate-good	16.89	3	VNI_DR16 VNI_DR19 VNI_MP32 VNI_NM038 VNI_NM039	56.2
		PCT 28	Derived	2.36	2	VNI_NM030	6.1
			Derived – Tall Shrubland	1.52	1	VNI_DR79	37.5

Appendix Q

Excluded impacts

Q1 Excluded impacts

This appendix summarises areas of excluded impacts through the results of native vegetation regulatory mapping of proposed Category 1 – exempt land and areas of overlapping approvals (Project EnergyConnect – East and HumeLink) with the project footprint.

Q1.1 Approved planning projects (additional excluded land)

Two approved projects, Project EneryConnect (NSW – Eastern section) (Application SSI-9172452 approved on 02 Sept 2022) and HumeLink (Application SSI-36656827 approved on 14 Nov 2024), have coinciding areas of impact with the project.

Q1.1.1 Project EnergyConnect (NSW – Eastern section)

Project EnergyConnect (PEC) intersects the project footprint in two locations being, Dinawan substation and the transmission easement directly to the west and Wagga Wagga substation and the transmission easement directly to the west (refer to section 1.2.1 of the BDAR). To quantify the area of vegetation subject to impact under the PEC approval, spatial data, including the approved disturbance area, was reviewed against the predicted impacts by the project.
A bespoke clearing design for construction and operation of the PEC easement utilised a partial clearing model, similar to that proposed by the project, where vegetation clearing was categorised into disturbance areas based on constructional and operational requirements for the transmission easement. Where vegetation was not in breach of the standard safe operational height and did not require clearing for construction, native vegetation was retained. Disturbance areas for PEC are as follows:

- Disturbance area A – refers to areas subject to full clearing to ground level including the areas at or around transmission line towers (including associated work areas), areas for brake and winch sites, new/upgraded access tracks, Dinawan substation site, Wagga Wagga substation site, several construction compounds and centreline area between transmission line towers in which all vegetation has been assumed to be removed during construction. Areas of Disturbance area A are considered to be subject to full clearing.
- Disturbance area B – refers to an area between transmission line towers in the easement in which removal of vegetation (including trees) would be undertaken where they have the potential to exceed vegetation clearance heights which have been set by Transgrid for operational and safety requirements. Areas of Disturbance area B are considered to be subject to partial clearing.

As vegetation may have been retained within the partial clearing area, Disturbance area B, the project did not assume clearing to have occurred and impacts incurred by the project were retained. In areas of full clearing, Disturbance area A, the project assumed the full clearing of native vegetation to have occurred, and impacts incurred by the project were retained. Geospatially, this occurred through the direct removal of the approved Disturbance area A from the project's disturbance model which is shown on BDAR Figure 15.6.

Q1.1.2 HumeLink

HumeLink intersects the project footprint south of Wagga Wagga between Ivydale Road and the future Gugaa 500 kV substation, and at the Tarcutta workers accommodation camp (refer to section 1.2.1 of the BDAR). To quantify the area of vegetation subject to impact under the HumeLink approval, spatial data, including the approved disturbance area, was reviewed against the predicted impacts by the project. A bespoke clearing design for the construction and operation of the HumeLink easement utilised a partial clearing model, similar to that proposed by the project, where native vegetation clearing was categorised into disturbance areas based on construction and operational requirements for the transmission easement. Where vegetation was not in breach of the standard safe operational height and did not require clearing for construction, native vegetation was retained. Disturbance areas for HumeLink are as follows:

- Total clearing zone (TCZ) – refers to lands subject to clearing and ground disturbance including permanent structures such as transmission line structures, access tracks and substations as well as temporary brake and winch sites and construction compounds. Areas of TCZ are considered to be subject to full clearing.
- Easement clearing zone (ECZ) – refers to lands within the proposed transmission line easement where clearing and ongoing maintenance of tall growing vegetation would be undertaken. Areas of ECZ are considered to be subject to partial clearing.

As vegetation may have been retained within the partial clearing zone (ECZ) the project did not assume clearing to have occurred and impacts incurred by the project have bene retained. In areas of full clearing (TCZ) the project assumed the full clearing of native vegetation to have occurred, and impacts incurred by the project were retained. Geospatially, this occurred through the direct removal of the approved TCZ from the project's disturbance model which is shown on BDAR Figure 15.6.

Q1.2 Background to Category 1 – Exempt land

In accordance with section 6.8 (3) of the BC Act, the BAM excludes the assessment of impacts on Category 1 – exempt land (within the meaning of Part 5A of the LLS Act, other than any impacts prescribed by the regulations under section 6.3).

The LLS Act defines 'category 1-exempt land' as areas of the State to which Part 5A of the LLS Act applies, which are designated as Category 1 – exempt land on the 'native vegetation regulatory map', prepared and published under the LLS Act. A native vegetation regulatory map (NVR) is being developed by CPHR which has been published in draft form.

Under the NSW Land Management Framework, the categorisation of land determines the native vegetation management options available to landholders. Rural land in NSW is categorised into three main categories:

- Category 1 – exempt land is land where native vegetation can be cleared without approval from Local Land Services.
- Category 2 – land is divided into:
  - Category 2 – regulated land is Category 2 land that is not Vulnerable or Sensitive regulated land. You may need authorisation from Local Land Services to clear native vegetation from rural zoned land in this category.
  - Category 2 – vulnerable regulated land is land where clearing of native vegetation may not be permitted under the Land Management (Native Vegetation) Code 2018, and a limited range of allowable activities are permitted.
  - Category 2 – sensitive regulated land is land where clearing is not permitted under the Land Management Code (Native Vegetation) Code 2018, and a limited range of allowable activities is permitted.
- Excluded land – is land where the Land Management (Native Vegetation) Code 2018 and allowable activities do not apply.

Q1.3 Land category criteria

Each land category is determined by various criteria as outlined in the LLS Act. Category 1 – exempt land is defined in section 60H of the LLS Act as the below:

1 Land is to be designated as Category 1 – exempt land if the Environment Agency Head reasonably believes that:

- **a** the land was cleared of native vegetation as at 1 January 1990, or
- **b** the land was lawfully cleared of native vegetation between 1 January 1990 and the commencement of this Part.

2 Land is to be designated as Category 1 – exempt land if the Environment Agency Head reasonably believes that:

- **a** the land contains low conservation value grasslands, or
- **b** the land contains native vegetation that was identified as regrowth in a property vegetation plan referred to in section 9 (2) (b) of the Native Vegetation Act 2003, or
- **c** the land is of a kind prescribed by the regulations as Category 1 – exempt land.

3 Land is to be designated as Category 1 – exempt land if the land is biodiversity certified under Part 8 of the BC Act or under any Act repealed by that Act.

4 However:

- **a** land described in subsection (1) or (2) is not to be designated as Category 1 – exempt land if section 60I (2) requires the land to be designated as Category 2 – regulated land, and
- **b** land described in subsection (1) (a) is not to be designated as Category 1 – exempt land if the land was unlawfully cleared of native vegetation after 1 January 1990, and
- **c** land described in subsection (2) (a) is not to be designated as Category 1 – exempt land if the land was unlawfully cleared of native vegetation after 1 January 1990.

5 The regulations may make provision for the purposes of determining whether grasslands are low conservation value grasslands for the purposes of this Division.

Q1.4 Determination of the category of mapped land

The matters relating to determination of mapped category of land are outlined in 60J of the LLS Act. Section 60J of the LLS Act is reproduced below:

1 This section makes provision relating to the mapping of land under this Division as Category 1 – exempt land or Category 2 – Regulated land.

2 Native vegetation that comprises grasslands or other non-woody vegetation is taken to have been cleared if the native vegetation was significantly disturbed or modified. The regulations may make provision for the purposes of determining whether native vegetation has been significantly disturbed or modified for the purposes of this Division.

3 Determinations may be made by the Environment Agency Head that land was unlawfully cleared of native vegetation only if compliance or enforcement action of a kind prescribed by regulations was taken in relation to the clearing.

4 Determinations may be made by the Environment Agency Head that land was cleared of native vegetation as at 1 January 1990 or between that date and the commencement of this Part only on the basis of the best available aerial photographs or satellite imagery before and after the relevant date, and any evidence provided by the landholder under section 60K (8).

5 Determinations made (or taken on appeal to have been made) by the Environment Agency Head as to whether land was or was not unlawfully cleared of native vegetation does not affect any decision made with respect to compliance or enforcement action taken under this or any other Act in relation to the clearing.

Q1.5 Assessment of Critically Endangered TECs

Critically Endangered Ecological Communities (CEECs) and flora species are designated as Category 2 – sensitive regulated land. Therefore, areas of potential Category 1 – exempt land require consideration of the potential presence of critically endangered communities and species.

There are five critically endangered flora species predicted by BAM likely to occur within the study area however, only two are considered likely to be affected. This assessment is supported by detailed seasonal surveys and verified vegetation mapping.

The CEEC recorded within the study area is *White Box – Yellow Box – Blakely Red Gum Grassland Woodland and Derived Native Grassland.* Areas in derived condition applied the 'Grasslands and other Groundcover Assessment Method (OEH 2017). A summary of the grassland transects for the low conservation value grasslands is provided in Table Q.1. These areas were previously Category 1 – exempt land are considered native vegetation and assessed as PCT 277 Derived no offset (Noting VI Score of <15).

Table Q.1 CEEC Low conservation value grasslands

Site ID	Location			Transect results (percent)			Outcome	Associated BAM VI Plot:
	Zone	Easting	Northing	Native	Exotic (perennial)	Exotic (annual)		
W2G_grassland01	55	537350	6104131	54	17	29	**Native** – Transect <50 per cent perennial exotic cover. Vegetation considered to be native and assigned to PCT 277 – Derived LCV.	VNI_DR107
W2G_grassland03	55	536805	6102188	58	18	25	**Native** – Transect <50 per cent perennial exotic cover. Vegetation considered to be native and assigned to PCT 277 – Derived LCV.	VNI_DR109
W2G_grassland04	55	543141	6097627	76	11	13	**Native** – Transect <50 per cent perennial exotic cover. Vegetation considered to be native and assigned to PCT 277 – Derived LCV.	VNI_DR111

Q1.6 Biodiversity assessment method requirements

In accordance with section 6.8(3) of the BC Act, when applying the Biodiversity Assessment Method (BAM) the assessor is to exclude the assessment of impacts of any clearing of native vegetation and loss of habitat on Category 1 – exempt land (within the meaning of Part 5A of the LLS Act), other than any impacts prescribed by the regulations under section 6.3.

All other rural lands that do not meet the definition of Category 1 – exempt land form part of the assessment area subject to the BAM.

Q1.7 Assessment of Category 1 – Exempt land

The LLS Act publishes maps (the NVR map) that show areas of the State to which Part 5A of the LLS Act applies, which are designated as Category 1 – exempt land. A draft NVR map has been prepared for the locality, and this was reviewed and used as the base of the land classification for this BDAR. The assessment was completed using existing spatial data and field verified (section 2.2.4.1 of BDAR) datasets. The methods and approach are outlined below.

Q1.7.1 Spatial data analysis

In defining the area of Category 1 – exempt land, an initial analysis of the following spatial datasets was undertaken:

- NVR: Transitional Native Vegetation Regulatory Map.
- State Vegetation Type Map (SVTM): current release December 2025.
- Aerial photos (to determine areas that were/are obviously under cultivation or improved pasture or otherwise disturbed).
- Information and records, including current and historical photographs of the subject land and current and historical high resolution.
- In areas of conflicting data:
  - where there were areas of potential derived native grasslands, a site-based verification was undertaken to confirm Category 1 or precautionary approach adopted and Category 2 assigned
  - where field verification could not be undertaken and SVTM was applied within the vegetation map, areas of identified PCT 0 were assumed to be Category 1 land including where the transitional NVR map identifies Category 2 land. Areas of sensitive, vulnerable or sensitive and vulnerable were retained as Category 2 and the associated patch of SVTM was updated to the nearest suitable PCT.

Q1.7.2 Field based survey analysis

The areas identified as Category 1 – exempt land using the NVR were field verified (section 2.2.4.1 of BDAR) and separated into the following categories:

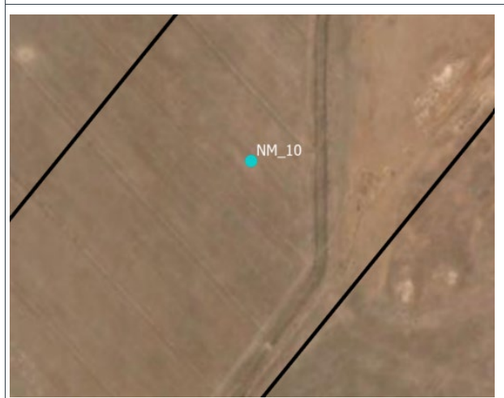
- Exotic vegetation or cropped land assessed as Category 1 – exempt land.
- Grassland areas that may have been historically cropped, however native species recolonised and <50 per cent perennial exotic grasses has categorised these areas as Derived_No Offset through the use of the interim grassland assessment module. When assessed under BAM 2020, these areas have a VI score of <15 and do not meet the offsetting threshold for non-threatened vegetation. These areas have been re-assigned as category-2 land.
- Chenopod shrublands that have been historically cropped but natural regeneration has increased the cover and abundance of native grasses, chenopods and annual forbs. Exotic annual grasses and forbs are present however the VI score determined the vegetation condition to be in moderate-good and therefore these areas have been re-assigned as category-2 land.

This on ground verification and comparison to the transitional NVR map resulted in an increase in the area of category-2 land. All category-1 lands identified within the subject land are exempt from BAM assessment and are not considered further in this BDAR.

The outcome of native vegetation regulatory mapping category 1-exempt land is illustrated in Figure 15.6. The results of the Interim Grasslands method intersect transections is provided in Table Q.2. Results of rapid data point assessments is provided in Table Q.3 and results of remote assessments is provided in Table Q.4.

Q1.7.3 Outcome of assessments

Table Q.2 Outcome of Interim Grasslands method transects

Site location and photos	Assessment method used	Site ID	Holding	Location			Transect results (percent)			Outcome
				Zone	Easting	Northing	Native	Exotic (perennial)	Exotic (annual)	
 Location of 'VNIGrassland_NM02'  VNIGrassland_NM02 site photo	Site assessment (transect) Desktop assessment (aerial imagery and review of existing mapping databases)	VNIGrassland_NM02	H223	54	762261	6095978	0	0	100	Area mapped as Category 1 Land under the Native Vegetation Regulatory Mapping. Transect VNIGrassland_NM02 recorded <50 per cent perennial exotic cover. However, no native vegetation was recorded. Despite this, WSP mapped as Category 2 – Regulated Land as a precautionary approach as adjacent site assessments were native with no clear boundary under field verification.
 Location of 'NM_10' with aerial imagery showing evidence of recent cropping	Site assessment (transect) Desktop assessment (aerial imagery and review of existing mapping databases)	NM_10	H223	54	759333	6092668	0	0	100	Area mapped as Category 1 Land under the Native Vegetation Regulatory Mapping. Transect NM_10 recorded entirely annual exotic species. Clear evidence of cropping on aerial imagery. Vegetation was therefore considered to be Category 1 Land.

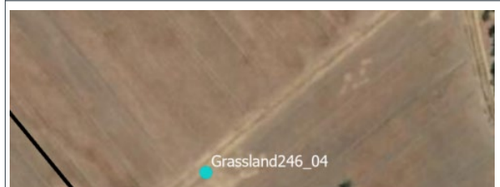
Site location and photos	Assessment method used	Site ID	Holding	Location			Transect results (percent)			Outcome
				Zone	Easting	Northing	Native	Exotic (perennial)	Exotic (annual)	
 Rapid data point from southern part of paddock showing evidence of cropping										
 Location of 'VNI_MPGrassland 01' with aerial imagery showing evidence of recent cropping  VNI_MPGrassland 01site photo showing evidence of recent cropping	Site assessment (transect) Desktop assessment (aerial imagery and review of existing mapping databases)	VNI_MPGrassland01	H283	54	761030	6083090	0	0	0	Area mapped as Category 1 Land under the Native Vegetation Regulatory Mapping. Transect VNI_MPGrassland01 occurred over a spent cropped paddock with no live native or exotic species recorded. Vegetation was therefore considered to be Category 1 Land.

Site location and photos	Assessment method used	Site ID	Holding	Location			Transect results (percent)			Outcome
				Zone	Easting	Northing	Native	Exotic (perennial)	Exotic (annual)	
 W2G_Grassland05 site photo and location to subject land boundary (black line)  Mapped Category1 lands within the subject land (H24) with recent cropping visible within subject land boundary	Site assessment (transect) Desktop assessment (aerial imagery and review of existing mapping databases)	W2G_grassland05	TL51-023	55	543925	6097408	16	70	16	Transect undertaken outside of subject land within the same paddock and vegetation condition. Area within subject land mapped as Category 1 Land under the Native Vegetation Regulatory Mapping. Transect W2G_grassland05 contained >50 per cent perennial exotic cover. Vegetation was therefore considered to be Category 1 Land.
 W2G_Grassland06 site photo and location to subject land boundary (black line). Evidence of recent cropping within subject land boundary	Site assessment (transect) Desktop assessment (aerial imagery and review of existing mapping databases) Rapid data point assessments	W2G_grassland06	TL51-011	55	537169	6102424	27	48	25	Transect undertaken outside of subject land within the same paddock and vegetation condition. Area mapped as Category 1 Land under the Native Vegetation Regulatory Mapping. Transect W2G_grassland06 contained >50 per cent perennial exotic cover. Vegetation was therefore considered to be Category 1 Land.

Site location and photos	Assessment method used	Site ID	Holding	Location			Transect results (percent)			Outcome
				Zone	Easting	Northing	Native	Exotic (perennial)	Exotic (annual)	
 Photo from rapid point within Category 1 mapped land within same paddock showing exotic vegetation and previously cropped land										
 W2G_Grassland07 site photo and location to subject land boundary (black line). Evidence of recent cropping within subject land boundary  Example condition of vegetation within adjacent subject land (rapid data point assessment) showing exotic groundcover and intensive grazing		W2G_grassland07	TL51-017	55	540759	6099273	40	50	10	Transect undertaken outside of subject land within the same paddock and vegetation condition. Area mapped as Category 1 Land under the Native Vegetation Regulatory Mapping. Transect W2G_grassland07 contained >50 per cent perennial exotic cover. Vegetation was therefore considered to be Category 1 Land.

Site location and photos	Assessment method used	Site ID	Holding	Location			Transect results (percent)			Outcome
				Zone	Easting	Northing	Native	Exotic (perennial)	Exotic (annual)	
 Grassland246_01 (blue) site photo and location to subject land boundary (black line). Evidence of recent cropping within subject land boundary  Location of 100% exotic transects (Grassland246_02, Grassland246_03 and Grassland246_04) relative to Grassland246_01  Grassland246_01 site photo	Site assessment (transect) Desktop assessment (aerial imagery and review of existing mapping databases) Rapid data point assessments	Grassland246_01	H246	54	759007	6087035	6	5	89	Transect undertaken outside of subject land within the same paddock and vegetation condition. Area mapped as Category 1 Land under the Native Vegetation Regulatory Mapping. Transect Grassland246_01 contained 6% perennial native 5% perennial exotic and 86% annual exotic cover. Whilst this suggests a native outcome, the plot is considered exotic due to the only natives being common recolonising species which are not characteristic of a specific PCT. Additionally, the plot occurs in the same cropped paddock as plots 246_02, 03 and 04 which are all exotic. Differences between these plots and 246_01 are evidence of slightly different disturbance timeframes within the past 6 months. Vegetation was therefore considered to be Category 1 Land.

Site location and photos	Assessment method used	Site ID	Holding	Location			Transect results (percent)			Outcome
				Zone	Easting	Northing	Native	Exotic (perennial)	Exotic (annual)	
 Grassland246_02 (blue) site photo and location to subject land boundary (black line). Evidence of recent cropping visible within subject land boundary	Site assessment (transect) Desktop assessment (aerial imagery and review of existing mapping databases) Rapid data point assessments	Grassland246_02	H246	54	759283	6087183	0	0	100	Transect undertaken outside of subject land within the same paddock and vegetation condition. Area mapped as Category 1 Land under the Native Vegetation Regulatory Mapping. Transect Grassland246_02 contained >50 per cent perennial exotic cover. Vegetation was therefore considered to be Category 1 Land.
 Grassland246_03 (blue) site photo and location to subject land boundary (black line). Evidence of recent cropping visible within subject land boundary  Rapid data point from road showing cropped paddock (R16) where transect was undertaken	Site assessment (transect) Desktop assessment (aerial imagery and review of existing mapping databases) Rapid data point assessments	Grassland246_03	H246	54 (R16) 54 (R17) 54	759577 759948 759132	6087083 6086518 6086384	0	3	97	Transect undertaken outside of subject land within the same paddock and vegetation condition. Area mapped as Category 1 Land under the Native Vegetation Regulatory Mapping. Transect Grassland246_03 contained >50 per cent perennial exotic cover. Vegetation was therefore considered to be Category 1 Land.

Site location and photos	Assessment method used	Site ID	Holding	Location			Transect results (percent)			Outcome
				Zone	Easting	Northing	Native	Exotic (perennial)	Exotic (annual)	
 Rapid data point from fenceline showing cropped paddock (R17) where transect was undertaken										
 Grassland246_04 site photo and location to subject land boundary (black line). Evidence of recent cropping visible within subject land boundary  Example condition of vegetation within adjacent subject land (rapid data point assessment) showing current cropping	Site assessment (transect) Desktop assessment (aerial imagery and review of existing mapping databases) Rapid data point assessments	Grassland246_04	H246	54	759471	6086616	0	0	100	Transect undertaken outside of subject land within the same paddock and vegetation condition. Area mapped as Category 1 Land under the Native Vegetation Regulatory Mapping. Transect Grassland246_04 contained >50 per cent perennial exotic cover. Vegetation was therefore considered to be Category 1 Land.

Site location and photos	Assessment method used	Site ID	Holding	Location			Transect results (percent)			Outcome
				Zone	Easting	Northing	Native	Exotic (perennial)	Exotic (annual)	
 Grassland246_04 site photo										
 Vni_g107 within subject land, showing current cropping lines	Site assessment (transect) Desktop assessment (aerial imagery and review of existing mapping databases) Remote assessment	Vni_gl07	H217	54	761946	6099220	0	0	100	Area mapped as Category 1 Land under the Native Vegetation Regulatory Mapping. Transect Vni_g107 recorded entirely annual exotic species. Vegetation was therefore considered to be Category 1 Land.

Table Q.3 Outcome of rapid data point assessments

Site location and photos	Assessment method used	Holding number	Location (rapid data point photos)				Outcome
			Rapid data point photo reference	Zone	Easting	Northing	
  Location of mapped Category1 exempt land (pink area) within H307 showing rapid data point surveys (dots)  Photo from rapid point within Category 1 mapped land (R1) showing cropped land	Desktop assessment (aerial imagery and review of existing mapping databases) Rapid data point assessments	H307	R1 R2 R3	54 54 54	760447 761093 760674	6076271 6075097 6072732	Area mapped as Category 1 Land under the Native Vegetation Regulatory Mapping. Rapid data point assessments were undertaken throughout the mapped located to verify consistency of vegetation. Vegetation was confirmed to be dominated by exotic annual species and consisted of recent cropping as demonstrated in attached photos. Vegetation was therefore considered to be Category 1 Land.

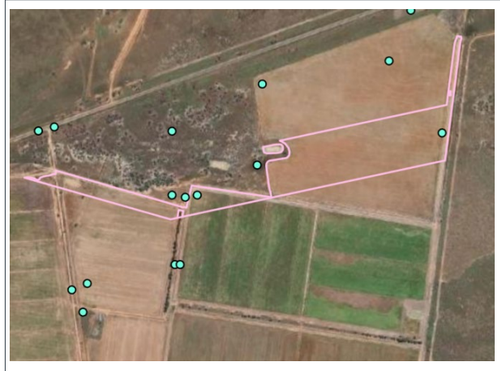
Site location and photos	Assessment method used	Holding number	Location (rapid data point photos)				Outcome
			Rapid data point photo reference	Zone	Easting	Northing	
 Photo from rapid data point within Category 1 mapped land (R2) showing cropped land  Photo from rapid data point within Category 1 mapped land (R3) showing cropped land							
 Location of mapped Category1 exempt land (pink area) within H281 , showing rapid data point (dot) immediately adjacent. Evidence of recent cropping visible	Desktop assessment (aerial imagery and review of existing mapping databases) Rapid data point assessments	H281	R4	54H	760095	6084760	Area mapped as Category 1 Land under the Native Vegetation Regulatory Mapping. A rapid data point assessment was undertaken adjacent to the mapped location to verify consistency of vegetation. Vegetation was confirmed to be dominated by exotic annual species and consisted of recent cropping. Vegetation was therefore considered to be Category 1 Land.

Site location and photos	Assessment method used	Holding number	Location (rapid data point photos)				Outcome
			Rapid data point photo reference	Zone	Easting	Northing	
 Photo from rapid point within Category 1 mapped land (R4) showing cropped land within paddock							
 Location of mapped Category1 exempt land (pink area) within H219 showing rapid data point surveys (dots)  Photo from rapid point within Category 1 mapped land (R5) showing cropped land	Desktop assessment (aerial imagery and review of existing mapping databases) Remote assessment Rapid data point assessments from boundary Site assessment (transect Vni_g107) within adjacent property and assessment from boundary	H219	R5 R6 R7	54 54 54	762772 761509 762473	6096576 6098224 6096956	Area mapped as Category 1 Land under the Native Vegetation Regulatory Mapping. Rapid data point assessments were undertaken throughout the mapped located to verify consistency of vegetation. Vegetation was confirmed to be dominated by exotic annual species and consisted of recent cropping as demonstrated in attached photos. Transect Vni_g107 recorded entirely annual exotic species – this was confirmed to be consistent with condition in adjacent paddock (H287) as viewed over fence. Vegetation was therefore considered to be Category 1 Land.

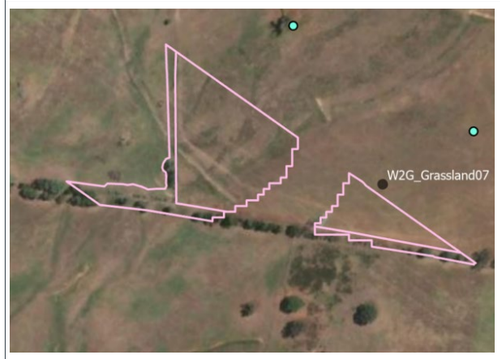
Site location and photos	Assessment method used	Holding number	Location (rapid data point photos)				Outcome
			Rapid data point photo reference	Zone	Easting	Northing	
 Location of mapped Category1 exempt land (pink area) within H219 showing rapid data point surveys (dots) and grassland transect from adjacent property (Vni_g107)  Photo from rapid point within Category 1 mapped land (R6) showing cropped land  Photo from rapid point within Category 1 mapped land (R7) showing cropped land							

Site location and photos	Assessment method used	Holding number	Location (rapid data point photos)				Outcome
			Rapid data point photo reference	Zone	Easting	Northing	
 Location of mapped Category1 exempt land (pink area) within H217 showing rapid data point surveys (dots)   Photos from rapid point within Category 1 mapped land (R8) showing cropped land	Desktop assessment (aerial imagery and review of existing mapping databases) Rapid data point assessments	H217	R8	54	763832	6101700	Area mapped as Category 1 Land under the Native Vegetation Regulatory Mapping. Area originally mapped as native vegetation community in April 2025. However, reassessment in October 2025 confirmed vegetation had since been cropped (see photos). Rapid data point assessments were undertaken at the edge of the mapped location to verify consistency of vegetation. Vegetation was confirmed to be dominated by exotic annual species and consisted of recent cropping as demonstrated in attached photos. Vegetation was therefore considered to be Category 1 Land.
 Location of mapped Category1 exempt land (pink area) within H219 showing rapid data point surveys (dots)	Desktop assessment (aerial imagery and review of existing mapping databases) Remote assessment Rapid data point assessments from boundary	H208	R9	54	763065	6102395	Area mapped as Category 1 Land under the Native Vegetation Regulatory Mapping. Rapid data point assessments were undertaken at the boundary of the mapped area to verify consistency of vegetation. Vegetation was confirmed to be dominated by exotic annual species and consisted of recent cropping as demonstrated in attached photos. Vegetation was therefore considered to be Category 1 Land.

Site location and photos	Assessment method used	Holding number	Location (rapid data point photos)				Outcome
			Rapid data point photo reference	Zone	Easting	Northing	
  Photos from rapid point within Category 1 mapped land (R9) showing cropped land							
 Location of mapped Category1 exempt land (pink area) within H401 showing rapid data point surveys (dots)	Desktop assessment (aerial imagery and review of existing mapping databases) Rapid data point assessments	H401	R10	54	768914	6119061	Area mapped as Category 1 Land under the Native Vegetation Regulatory Mapping. Rapid data point assessments were undertaken within the mapped area to verify consistency of vegetation. Vegetation was confirmed to be dominated by exotic annual species and consisted of recent cropping as demonstrated in attached photos. Vegetation was therefore considered to be Category 1 Land.

Site location and photos	Assessment method used	Holding number	Location (rapid data point photos)				Outcome
			Rapid data point photo reference	Zone	Easting	Northing	
 Photo from rapid point within Category 1 mapped land (R10) showing cropped land							
 Location of mapped Category1 exempt land (pink area) within H20 showing rapid data point surveys (dots)  Photo from rapid point within Category 1 mapped land (R11) showing cropped land	Desktop assessment (aerial imagery and review of existing mapping databases) Rapid data point assessments	H20	R11	55	359816	6118800	Area mapped as Category 1 Land under the Native Vegetation Regulatory Mapping. Rapid data point assessments were undertaken within the mapped area to verify consistency of vegetation. Vegetation was confirmed to be dominated by exotic annual species and consisted of recent cropping as demonstrated in attached photos. Vegetation was therefore considered to be Category 1 Land.

Site location and photos	Assessment method used	Holding number	Location (rapid data point photos)				Outcome
			Rapid data point photo reference	Zone	Easting	Northing	
 Location of mapped Category1 exempt land (pink area) within H10 and H11 showing rapid data point surveys (dots)  Photo from rapid point within Category 1 mapped land (R12) showing exotic vegetation, evidence of previous cropping/ploughing visible	Desktop assessment (aerial imagery and review of existing mapping databases) Rapid data point assessments	T51-H10	R12	55	537108	6102460	Area mapped as Category 1 Land under the Native Vegetation Regulatory Mapping. Rapid data point assessments were undertaken within the mapped area to verify consistency of vegetation. Vegetation was confirmed to be dominated by exotic annual species with evidence of previous cropping as demonstrated in attached photo. Vegetation was therefore considered to be Category 1 Land.
 Location of mapped Category1 exempt land (pink area) within H14 showing rapid data point surveys (dots)	Desktop assessment (aerial imagery and review of existing mapping databases) Rapid data point assessments	H14	R13	55	539107	6100459	Area mapped as Category 1 Land under the Native Vegetation Regulatory Mapping. Rapid data point assessments were undertaken within the mapped area to verify consistency of vegetation. Vegetation was confirmed to consist only of ornamental plantings with exotic groundcover. Vegetation was therefore considered to be Category 1 Land.

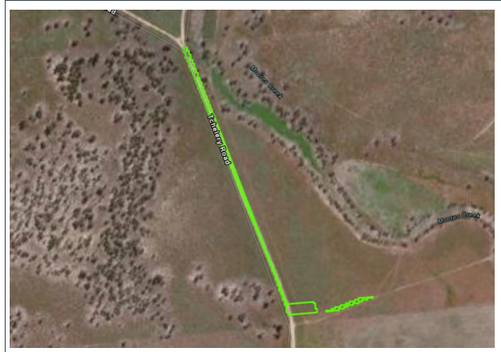
Site location and photos	Assessment method used	Holding number	Location (rapid data point photos)				Outcome
			Rapid data point photo reference	Zone	Easting	Northing	
 Photo from rapid point adjacent to Category 1 mapped land (R13) showing grazed/exotic groundcover							
  Location of mapped Category1 exempt land (pink area) within H18 showing rapid data point surveys (dots)	Desktop assessment (aerial imagery and review of existing mapping databases) Rapid data point assessments	H18	R14	55	541020	6099111	Areas mapped as Category 1 Land under the Native Vegetation Regulatory Mapping. Rapid data point assessments were undertaken within the mapped area to verify consistency of vegetation. Vegetation was confirmed to consist only of ornamental plantings with exotic groundcover. Vegetation was therefore considered to be Category 1 Land.

Site location and photos	Assessment method used	Holding number	Location (rapid data point photos)				Outcome
			Rapid data point photo reference	Zone	Easting	Northing	
 Photo from rapid point adjacent to Category 1 mapped land (R14) showing ornamental plantings with grazed/exotic groundcover							
 Location of mapped Category1 exempt land (pink area) within H16 showing rapid data point surveys (dots)	Desktop assessment (aerial imagery and review of existing mapping databases) Rapid data point assessments	H16	R15	55	539955	6099849	Areas mapped as Category 1 Land under the Native Vegetation Regulatory Mapping. Rapid data point assessments were undertaken within the mapped area to verify consistency of vegetation. Vegetation was confirmed to consist only of ornamental plantings with exotic groundcover. Vegetation was therefore considered to be Category 1 Land.
 Photo from rapid point adjacent to Category 1 mapped land (R15) showing ornamental plantings with grazed/exotic groundcover							

Table Q.4 Outcome of spatial data assessments

Site location and photos	Assessment method used	Holding	Outcome
	Desktop assessment (aerial imagery and review of existing mapping databases) NSW SVTM	H32	Area was not assessed via field survey. The polygons were mapped as Category 2 Land under the Native Vegetation Regulatory Mapping. However, NSW SVTM identifies these areas as PCT 0 (non-native vegetation) and there is visible clearing (existing vehicle track and disturbance) visible for these areas on aerial imagery. Given this WSP have mapped these areas as Category 1 Lands.
 	Desktop assessment (aerial imagery and review of existing mapping databases) NSW SVTM	H355	Area was not assessed via field survey. The pink polygon was mapped as Category 1 Land while the green polygons were mapped as Category 2 Land under the Native Vegetation Regulatory Mapping. However, NSW SVTM identifies both areas as PCT 0 (non-native vegetation) and there is visible clearing (existing vehicle track and disturbance) visible for these areas on aerial imagery. Given this WSP have mapped both areas as Category 1 Lands.

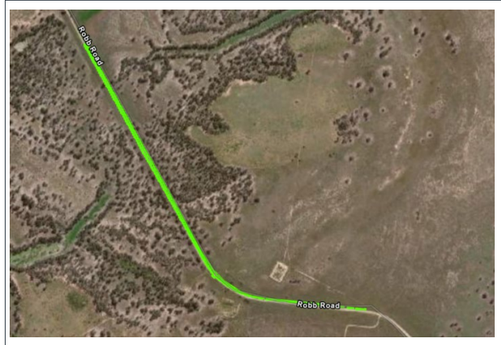
Site location and photos	Assessment method used	Holding	Outcome
 	Desktop assessment (aerial imagery and review of existing mapping databases) NSW SVTM	H360	Area was not adequately assessed via field survey. The pink polygon was mapped as Category 1 Land while the green polygon was mapped as Category 2 Land under the Native Vegetation Regulatory Mapping. However, NSW SVTM identifies both areas as PCT 0 (non-native vegetation) and there is visible clearing (existing infrastructure, vehicle tracks and disturbance) visible for these areas on aerial imagery. Given this WSP have mapped both areas as Category 1 Lands.
	Desktop assessment (aerial imagery and review of existing mapping databases) NSW SVTM	H386	Area was not assessed via field survey. The pink polygons were mapped as Category 1 Land while the green polygons were mapped as Category 2 Land under the Native Vegetation Regulatory Mapping. However, NSW SVTM identifies both areas as PCT 0 (non-native vegetation) and there is visible clearing (existing vehicle tracks, including Maude Rd) visible for these areas on aerial imagery. Given this WSP have mapped both areas as Category 1 Lands.

Site location and photos	Assessment method used	Holding	Outcome
	Desktop assessment (aerial imagery and review of existing mapping databases) NSW SVTM	H387	Area was not assessed via field survey. The polygons were mapped as Category 2 Land under the Native Vegetation Regulatory Mapping. However, NSW SVTM identifies these areas as PCT 0 (non-native vegetation) and there is visible clearing (existing vehicle track and disturbance) visible for these areas on aerial imagery. Given this WSP have mapped these areas as Category 1 Lands.
	Desktop assessment (aerial imagery and review of existing mapping databases) NSW SVTM	H389 Tchelery Rd	Area was not assessed via field survey. The polygons were mapped as Category 2 Land under the Native Vegetation Regulatory Mapping. However, NSW SVTM identifies these areas as PCT 0 (non-native vegetation) and there is visible clearing (existing vehicle tracks including Tchelery Rd) visible for these areas on aerial imagery. Given this WSP have mapped these areas as Category 1 Lands.
	Desktop assessment (aerial imagery and review of existing mapping databases) NSW SVTM	H389 Tchelery Rd	Area was not assessed via field survey. The polygon was mapped as Category 1 Land under the Native Vegetation Regulatory Mapping. NSW SVTM identified this area as PCT 0 (non-native vegetation) and there is visible clearing (disturbance) on aerial imagery. Given this WSP have mapped the area as Category 1 Lands.

Site location and photos	Assessment method used	Holding	Outcome
	Desktop assessment (aerial imagery and review of existing mapping databases) NSW SVTM	Wanganella Moulamein Rd	Area was not assessed via field survey. The polygon was mapped as Category 2 Land under the Native Vegetation Regulatory Mapping. However, NSW SVTM identifies this area as PCT 0 (non-native vegetation) and there is visible clearing (existing vehicle track and disturbance including Wanganella Moulamein Rd) visible for this area on aerial imagery. Given this WSP have mapped this area as Category 1 Lands.
	Desktop assessment (aerial imagery and review of existing mapping databases) NSW SVTM	H354	Area was not assessed via field survey. The polygon was mapped as Category 2 Land under the Native Vegetation Regulatory Mapping. However, NSW SVTM identifies this area as PCT 0 (non-native vegetation) and there is visible clearing (existing vehicle track and disturbance) visible for this area on aerial imagery. Given this WSP have mapped this area as Category 1 Lands.
	Desktop assessment (aerial imagery and review of existing mapping databases) NSW SVTM	H27 H32 Carrathool Rd	Area was not assessed via field survey. The pink polygons were mapped as Category 1 Land while the green polygons were mapped as Category 2 Land under the Native Vegetation Regulatory Mapping. However, NSW SVTM identifies both areas as PCT 0 (non-native vegetation) and there is visible clearing (existing vehicle tracks, including Carrathool Rd) visible for these areas on aerial imagery. Given this WSP have mapped both areas as Category 1 Lands.
	Desktop assessment (aerial imagery and review of existing mapping databases) NSW SVTM	Humelink (W2G) H2	Area was not assessed via field survey. The polygons were mapped as Category 1 Land under the Native Vegetation Regulatory Mapping. NSW SVTM identified these areas as PCT 0 (non-native vegetation) and there is visible clearing (disturbance) on aerial imagery. Given this WSP have mapped the areas as Category 1 Lands.

Site location and photos	Assessment method used	Holding	Outcome
			
 Lcoation of Category1 Mapped land within H13  Location of Category1 mapped land within H19	Desktop assessment (aerial imagery and review of existing mapping databases) NSW SVTM	H13 H19	Areas were not assessed in detail via field survey. The polygons were mapped as Category 1 Land under the Native Vegetation Regulatory Mapping. NSW SVTM identified these areas as PCT 0 (non-native vegetation) aerial imagery shows farm dams with clear (visible) disturbance. Given this WSP have mapped the areas as Category 1 Lands.

Site location and photos	Assessment method used	Holding	Outcome
	Desktop assessment (aerial imagery and review of existing mapping databases) NSW SVTM	H20 H21	Area was not assessed via field survey. The polygons were mapped as Category 1 Land under the Native Vegetation Regulatory Mapping. NSW SVTM identified these areas as PCT 0 (non-native vegetation) and there is visible clearing (disturbance) on aerial imagery. Given this WSP have mapped the areas as Category 1 Lands.
	Desktop assessment (aerial imagery and review of existing mapping databases) NSW SVTM	Cobramunga Rd Murrabit Rd	Areas were not assessed via field survey. The polygons were mapped as Category 2 Land under the Native Vegetation Regulatory Mapping. However, NSW SVTM identified these areas as PCT 0 (non-native vegetation), and aerial imagery shows clear roads (Cobramunga Rd and Murrabit Rd) under mapped area. Given this WSP have mapped the areas as Category 1 Lands.
	Desktop assessment (aerial imagery and review of existing mapping databases) NSW SVTM	H217 H221 H222 Cunninyeuk Rd	Area was not assessed via field survey. The polygons were mapped as Category 1 Land under the Native Vegetation Regulatory Mapping. NSW SVTM identified these areas as PCT 0 (non-native vegetation) and there is visible cropping on aerial imagery. Given this WSP have mapped the areas as Category 1 Lands.

Site location and photos	Assessment method used	Holding	Outcome
	Desktop assessment (aerial imagery and review of existing mapping databases) NSW SVTM	Robb Rd	Area was not assessed via field survey. The polygons were mapped as Category 2 Land under the Native Vegetation Regulatory Mapping. However, NSW SVTM identified these areas as PCT 0 (non-native vegetation), and aerial imagery shows clear roads (Robb Rd) under mapped area. Given this WSP have mapped the areas as Category 1 Lands.
  	Desktop assessment (aerial imagery and review of existing mapping databases) NSW SVTM	Wanganella Moulamein Rd	Areas were not assessed via field survey. The polygons were mapped as Category 2 Land under the Native Vegetation Regulatory Mapping. However, NSW SVTM identified these areas as PCT 0 (non-native vegetation), and aerial imagery shows clear roads (Wanganella Moulamein Rd) and surrounding disturbed areas. Given this WSP have mapped the areas as Category 1 Lands.

Site location and photos	Assessment method used	Holding	Outcome
 			
 	Desktop assessment (aerial imagery and review of existing mapping databases) NSW SVTM	Willurah Rd	Areas were not assessed via field survey. The polygons were mapped as Category 2 Land under the Native Vegetation Regulatory Mapping. However, NSW SVTM identified these areas as PCT 0 (non-native vegetation), and aerial imagery shows clear roads (Willurah Rd) and surrounding disturbed areas. Given this WSP have mapped the areas as Category 1 Lands.

Site location and photos	Assessment method used	Holding	Outcome
			
	Desktop assessment (aerial imagery and review of existing mapping databases) NSW SVTM	Moulamein Rd Sturt Hwy	Areas were not assessed via field survey. The polygons were mapped as Category 2 Land under the Native Vegetation Regulatory Mapping. However, NSW SVTM identified these areas as PCT 0 (non-native vegetation), and aerial imagery shows clear roads (Moulamein Rd) and surrounding disturbed areas. Given this WSP have mapped the areas as Category 1 Lands.