

Prepared for Samsung C&T Renewable Energy Australia (SREA) Pty Ltd

Biodiversity Development Assessment Report

Mangoplah BESS

Wagga Wagga LGA, Mangoplah, NSW

October 2025

Project Number: 240779

Document verification

Project Title:	Mangoplah BESS
Project Number:	240779
Project File Name:	240779 Mangoplah BESS BDAR Final V1

Revision	Date	Prepared by	Approved by
Draft V1.0	3/04/2025	Maddie Robertson Justin Solomons Liarna Miller Julie Gooding (BAAS18074)	Julie Gooding (BAAS18074)
Draft V1.1	29/08/2025	Maddie Robertson Liarna Miller Julie Gooding (BAAS18074)	Julie Gooding (BAAS18074)
Final V1.0	15/10/2025	Maddie Robertson Liarna Miller Julie Gooding (BAAS18074)	Julie Gooding (BAAS18074)

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Executive summary

Background

Samsung C&T Renewable Energy Australia (SREA) Pty Ltd is proposing the development of the Mangoplah Battery Energy Storage System (the Project). The Project would involve the construction, operation and decommissioning of a Battery Energy Storage System (BESS) with a capacity of up to approximately 100 Megawatts (MW) / 400MWh (4 hours).

The Project would be located within the Wagga Wagga Local Government Area (LGA), approximately 3.1 kilometres (km) east of the township of Mangoplah, and approximately 30.6 km south of the regional city of Wagga Wagga, New South Wales (NSW). The site address is 4178 Holbrook Road, Mangoplah NSW 2652.

Site Biodiversity

Two Plant Community Types (PCT), representing two Threatened Ecological Communities (TECs) listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and two TECs listed under the *Biodiversity Conservation Act 2016* (BC Act) were identified within the Subject Land. Seven threatened species were also identified as present during surveys within the Subject Land. These entities are:

- PCT 76: Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions .
 - Listed under the EPBC Act as *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia* (Grey Box Woodland) – Endangered.
 - Listed under the BC Act as *Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions* (Inland Grey Box Woodland) – Endangered.
- PCT 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion.
 - Listed under the EPBC Act as *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* (Box-Gum Woodland) – Critically Endangered .
 - Listed under the BC Act as *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* (Box-Gum Woodland) – Critically Endangered.
- Barking Owl (*Ninox connivens*)
 - Vulnerable – BC Act
- Corben's Long-eared Bat (*Nyctophilus corbeni*)*
 - Vulnerable – EPBC Act
 - Vulnerable – BC Act
- Large Bent-winged Bat (*Miniopterus orianae oceanensis*)
 - Vulnerable – BC Act
- Masked Owl (*Tyto novaehollandiae*)
 - Vulnerable – BC Act
- Southern Myotis (*Myotis macropus*)
 - Vulnerable – BC Act
- Squirrel Glider (*Petaurus norfolcensis*)
 - Vulnerable – BC Act

- Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*)
 - Vulnerable – BC Act.

*Identified as 'potentially present' in microbat call identification report

Five species were 'assumed present' and have been included in this assessment as present, until targeted surveys have been completed during each species' survey period to confirm presence or absence or Expert Report provided. These include the following species:

Flora

- A Spear-grass (*Austrostipa wakoolica*)
- Euphrasia arguta (*Euphrasia arguta*)
- Yass Daisy (*Ammobium craspedioides*).

Fauna

- Golden Sun Moth (*Synemon plana*)
- Striped Legless Lizard (*Delma impar*).

Avoid and minimise

Avoidance and minimisation of impacts has been achieved through the following measures:

1. **Site Selection:** The proposed location of the BESS has historically been cleared for cropping, and is comprised of exotic vegetation. Through selecting this BESS site, biodiversity loss has been avoided, thereby reducing potential impacts on native ecosystems.
2. **Access Track Design:** An existing access track has been proposed to be widened. This has minimised disturbance to the surrounding environment by utilising what is currently available. Multiple iterations to the access track design has occurred to avoid as much clearing of native vegetation as possible.
3. **Additional and appropriate measures to minimise impact to Serious and Irreversible Impact entities:** The existing access track has been used to minimise impacts to Box-Gum Woodland in the locality. Impacts occur to only the most disturbed vegetation alongside the current access track, with more intact patches being retained. To compensate for the clearing of Box-Gum Woodland, biodiversity offsets are required and credits will be retired.

Impact summary

Where impacts could not be avoided, the proposal involves the removal of approximately;

- 0.15 hectares (ha) of PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions in a derived grassland form,
- 1.50 ha of PCT 277 Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion in a derived grassland form and
- 0.35 ha of PCT 277 Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion in a woodland form.

The proposal involves the removal of five hollow bearing trees (HBTs) which provides habitat for fauna species that were observed on site. Additional threatened species with assumed presence rely on PCT 277 and PCT 76 as habitat. These species require an offset for species credit, included below. A summary of the offset obligations is provided in the tables E1-Table E-2 below.

Table E1 Impacts that require an offset – ecosystems credits

Vegetation zone	PCT_Vegetation zone_condition	Threatened Ecological Community (TEC)	Impact area (ha)	Number of ecosystem credits required
1	277_Woodland_Good	<i>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</i>	0.22	8
2	277_Woodland_Moderate	<i>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</i>	0.13	3
3	277_Derived Grassland_Low	<i>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</i>	1.50	33
4	76_Derived Grassland_Low	<i>Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions</i>	0.15	2

Vegetation Zone 1 also qualifies as the EPBC Act *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* critically endangered ecological community.

Table E2 Impacts that require an offset – species credits

Common name	Scientific name	Loss of habitat (ha) or individuals	Number of species credits required
Flora			
A spear-grass	<i>Austrostipa wakoolica</i>	2.00 ha	36
Euphrasia arguta	<i>Euphrasia arguta</i>	2.00 ha	56
Yass Daisy	<i>Ammobium craspedioides</i>	40 individuals	80
Fauna			
Barking Owl	<i>Ninox connivens</i>	0.23 ha	7
Golden Sun Moth	<i>Synemon plana</i>	2.00 ha	29
Masked Owl	<i>Tyto novaehollandiae</i>	0.23 ha	7
Southern Myotis	<i>Myotis macropus</i>	1.00 ha	18

Common name	Scientific name	Loss of habitat (ha) or individuals	Number of species credits required
Squirrel Glider	<i>Petaurus norfolcensis</i>	0.05 ha	1
Squirrel Glider in the Wagga Wagga Local Government Area	<i>Petaurus norfolcensis</i> – <i>endangered population</i>	0.05 ha	1
Striped Legless Lizard	<i>Delma impar</i>	2.00 ha	29

The retirement of the credits will be carried out in accordance with the NSW Biodiversity Offsets Scheme (BOS), and will be achieved by either:

1. Retiring credits under the Biodiversity Offsets Scheme based on the like-for-like rules, or
2. Making payments into the Biodiversity Conservation Fund using the offset payments calculator, or
3. Funding a biodiversity action that benefits the threaten entities impacted by the development.

This BDAR also documents impact on Commonwealth Matters of Environmental Significance (MNES). The EPBC Act Protected Matters Report identified 41 threatened species with the potential to occur within the search area. Of these species, 23 were identified through habitat assessment and the BAM-C as either being present, assumed present or having the potential to utilise habitat found within the Development Footprint. Eight listed migratory species were identified in the EPBC Act Protected Matters Report, however only three were identified as having the potential to utilised habitat within the Subject Land. Assessments of Significance (AoSs) were completed for these species, which concluded that significant impacts to these species is unlikely.

Four Ramsar Wetlands of International Importance were identified, but are over 300 km in proximity to the Development Footprint, therefore highly unlikely to be impacted by the proposal.

The federally listed TEC - *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of south-eastern Australia* and *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* occur within the Subject Land but would not be impacted by the proposal. *White Box-Yellow Box- Blakely's Red Gum Grassy Woodland and Derived Native Grassland* federally listed TEC also occurs within the Development Footprint. An AoS was completed for this TEC, which determined that the proposal is unlikely to have any significant impacts on this TEC (Appendix B). The woodland meeting the criteria for *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of south-eastern Australia* would not be impacted by the proposal.

A referral (EPBC2025/10220) under the EPBC Act to the Federal Department of Climate Change, Energy, the Environment and Water was undertaken, with the referral decision determining the proposal is not a controlled action.

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Acronyms and Abbreviations

AC	Alternating Current
AOBV	Areas of Outstanding Biodiversity Value
AOO	Area of Occupancy
AoS	Assessment of Significance
BAM	Biodiversity Assessment Method
BAM-C	BAM Calculator
BC Act	<i>Biodiversity Conservation Act 2016 (NSW)</i>
BC Regulation	Biodiversity Conservation Regulation 2017 (NSW)
BDAR	Biodiversity Development Assessment Report
BESS	Battery Energy Storage System
Biosecurity Act	<i>Biosecurity Act 2015 (NSW)</i>
BMP	Biodiversity Management Plan
BOAMS	Biodiversity Offset and Agreement Management System
BOS	Biodiversity Offset Scheme
BV	Biodiversity Values
CE	Critically Endangered
CEEC	Critically Endangered Ecological Community
CPHR	Conservation Programs, Heritage and Regulation
Cth	Commonwealth
DBH	Diameter at Breast Height (1.3m) over bark
DCCEEW	Department of Climate Change, Energy, the Environment and Water (Cth)
DECCW	Department of Environment, Climate Change and Water (NSW)
DP	Deposited Plan
E	Endangered
EIS	Environmental Impact Statement
EMS	Environmental Management Strategy
EOO	Extent of Occurrence
EP&A Act	<i>Environmental Planning and Assessment Act 1979 (NSW)</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Cth)</i>
FM Act	<i>Fisheries Management Act 1994 (NSW)</i>

FSC	Fauna Spotter Catcher
GDA	Geographic Datum of Australia
GIS	Geographic Information System
GPS	Geographical Positioning System
ha	hectares
HBT	Hollow-Bearing Tree
HV	High Voltage
HVAC	Heating, Ventilation and Air Conditioning
IBRA	Interim Biogeographic Regionalisation for Australia
IUCN	International Union for Conservation of Nature
KFH	Key Fish Habitat
km	kilometres
kV	Kilovolts
LCA	Land Category Assessment
LGA	Local Government Area
LLS Act	<i>Local Land Services Act 2013</i>
m	Metres
MNES	Matters of National Environmental Significance
MVA	Mega Volt-Amperes
MW	Megawatt
MWh	Megawatt-hours
NSW	New South Wales
NVR	Native Vegetation Regulatory
OEH	Office of Environment and Heritage (NSW)
PCT	Plant Community Type
PMST	Protected Matters Search Tool
RAP	Rapid Assessment Point
SAIL	Serious and Irreversible Impact
SAT	Spot Assessment Technique
SEARs	Secretary's Environmental Assessment Requirements
SEED	Sharing and Enabling Environmental Data
SEPP	<i>State Environmental Planning Policy 2021 (NSW)</i>

Sp./spp.	Species/multiple species
SREA	Samsung C&T Renewable Energy Australia Pty Ltd
SSD	State Significant Development
SVTM	State Vegetation Type Mapping
TBDC	Threatened Biodiversity Data Collection
TEC	Threatened Ecological Community – a general term given to both Commonwealth and NSW listed ecological communities
TPZ	Tree Protection Zone
TSSC	Threatened Species Scientific Committee
V	Vulnerable
VI	Vegetation Integrity

Accredited assessor declaration

Certification under clause 6.15 Biodiversity Conservation Act 2016

I certify that this report has been prepared on the basis of the requirements of, and information provided under the Biodiversity Assessment Method and s6.15 of the BC Act. It has been assessed in accordance with BAM 2020. A full list of staff qualifications and experience can be found in Appendix F of this report.

In preparing this assessment I have acted in accordance with the Accredited BAM Assessor Code of Conduct.

I declare that I have considered the circumstances and there is no actual, perceived or potential conflict of interest.

Signature: 

Name: Julie Gooding

Date: 6/11/2025

BAM Assessor Accreditation No.: BAAS18079

The associated development case 00052652/BAAS18074/24/000052653 within the BAM Calculator has been finalised as of 6/11/2025, with the associated credit report reflected in Revision 2. Please notify NGH when you submit the report and we will submit the BAM-C case to the appropriate regulator.

Details and experience of author/s and contributors

Name	BAM assessor accreditation No. (if relevant)	Position/role	Tasks performed	Relevant qualifications
Julie Gooding	BAAS18074	BAM accredited assessor	Oversee fieldwork Oversee project direction Oversee reporting Fieldwork – PCT mapping and VI plots GIS mapping BAM-C data entry and analysis BDAR Review and Approval	Bachelor of Science (Biology)
Clare Vincent		Senior Ecologist	Report data entry	Graduate Diploma in Environmental Management
Maddie Robertson		Ecologist	Targeted surveys GIS mapping	Bachelor of

Name	BAM assessor accreditation No. (if relevant)	Position/role	Tasks performed	Relevant qualifications
			Main author	Science (Biodiversity and Conservation), Bachelor of Environment
Michael Cleland		Ecologist	VI plots Targeted Flora and Fauna surveys	Bachelor of Environmental Science and Management
Julia Chabros		Ecologist	Targeted Flora and Fauna surveys	Bachelor of Environmental Management (Ecology), Honours (Ecology)
Justin Solomons		Ecologist	GIS mapping Targeted Flora and Fauna surveys Contributing author	Bachelor of Environmental Science (Ecological Conservation)
Evan Creek		Ecologist	Fieldwork – PCT mapping and VI plots	Bachelor of Science (Ecology)
Liarna Miller		Ecologist	Targeted Fauna Surveys	Bachelor of Environmental Science and Management (Ecology and Conservation)

Conflict of interest

I declare that I have considered the circumstances and there is no actual, perceived or potential conflict of interest

Signature: 

Date: 6/11/2025

BAM Assessor Accreditation No.: BAAS18074

Stage 1: Biodiversity assessment

1. Introduction

The proposed Mangoplah Battery Energy Storage System (BESS) is classified as a State Significant Development (SSD), requiring consent under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). As per the NSW Biodiversity Conservation Act 2016 (BC Act), the Biodiversity Offsets Scheme (BOS) applies to all SSDs requiring preparation of a BDAR to support the Environmental Impact Statement (EIS).

This BDAR assesses the impacts of the proposed Mangoplah BESS (the proposal) according to the NSW Biodiversity Assessment Methodology (BAM) as required by the Secretary's Environmental Assessment Requirements (SEARs) for the proposal. NGH has prepared this report on behalf of the proponent, Samsung C&T Renewable Energy Australia Pty Ltd (SREA). This BDAR has been prepared in accordance with the *Biodiversity Assessment Methodology 2020* (BAM) and as per the SEARs, issued for the SSD-77527735 on 27 November 2024.

Report terminology

The following terms are used in this document:

- a) **The Project** – The Mangoplah Battery Energy Storage System (BESS) including associated infrastructure and access tracks.
- b) **Development Footprint**– all areas of land which may be directly impacted by the proposal, either during construction, operation or decommissioning. The Development Footprint has been defined by the impact area required for development. Development Footprint areas are used in the BAM Calculator (BAM-C) to generate ecosystem and species credits where relevant. The Development Footprint covers an area of 13.85 ha.
- c) **Subject Land** – the land proposed for development. The Subject Land contains the Development Footprint plus a 20 metre buffer around the BESS site and access track to consider indirect impacts. The Subject Land is the area where Stage 1 of the BAM has been applied, and vegetation surveys and targeted threatened species surveys have been undertaken. The Subject Land covers an area of 27.51 ha.
- d) **Assessment Area** – the assessment area includes the Subject Land plus the area of land within the 1500 m buffer zone surrounding the proposed BESS site and 500 m buffer zone around the access track (linear feature). The assessment area is used to consider landscape features and biodiversity values in the locality, and covers an area of 1137.17 ha.

1.1. Proposed development

1.1.1. Development overview

Samsung C&T Renewable Energy Australia Pty Ltd (The Applicant) is proposing the development of the Mangoplah Battery Energy Storage System (the Project). The Project would involve the construction, operation and decommissioning of a Battery Energy Storage System (BESS) with a capacity of up to approximately 100 Megawatts (MW) / 400MWh (4 hours). It would supply electricity to the National Electricity Market during peak demand periods. Construction is expected to commence in 2027 over approximately 12-15 months. It is anticipated that the Project would operate for approximately 20 years based on the design

life of the battery system. Decommissioning would be completed within 18 months of the cessation of operations.

1.1.2. Location

The Project would be located within the Wagga Wagga Local Government Area (LGA), approximately 3.1 kilometres (km) east of the township of Mangoplah, and approximately 30.6 km south of the regional city of Wagga Wagga, New South Wales (NSW). The site address is 4178 Holbrook Road, Mangoplah NSW 2652 located within Lots 222, 225 and 228 of Deposited Plan (DP) 754557. Refer to

Figure 1-1.

1.1.3. Subject Land

The Subject Land and wider surrounds (Assessment Area) have been subjected to heavy clearing in the past for agricultural use. Patches of woodland remain, with low condition grassland due to agricultural-related activities including grazing and trampling. Non-native vegetation occurs as exotic vegetation, roads, access tracks, residential dwellings and ancillary buildings.

The Subject Land is currently utilised for agricultural purposes, with historic clearing for access tracks and general agricultural use. According to the Draft Native Regulatory Map viewer it contains both Category 1 - exempt land, Category 2 - regulated land and Category 2 - vulnerable regulated land (NSW DPE, 2025). Vegetation in the Subject Land comprises primarily agricultural crops, exotic dominated grasslands and remnant woodland of varying condition levels. The Subject Land is also routinely used for cattle farming and grazing.

Key features of the Subject Land include the following:

- Paper Forest Creek (Key Fish Habitat)
- Remnant Box-Gum and Grey Box Woodlands.

Paper Forest Creek is a Strahler Order 5 stream, mapped Key Fish Habitat (KFH), and runs through the Subject Land from the northwest to the south along the access track. Multiple ephemeral streams occur through the access track component of the Subject Land including 1st, 2nd and 4th Strahler Order streams.

An internal access track runs from Holbrook Road to the BESS location, currently used for private use.

The Subject Land is approximately 27.51 ha.

1.1.4. Proposal details

The Project would involve construction of the following primary infrastructure:

- 100MW/400MWh(4hr) BESS and associated equipment
 - 108 Tesla Megapack 2XL units measuring approximately 8.8 m x 1.7 m x 2.8 m.
 - 27 4.6 MVA step-up transformers
 - 5 ring main units
- Onsite substation
 - 1 HV transformer
 - 33kV switch room
 - Auxiliary LV transformer

- 33/132kV transformer
- Connection works including 132 kV AC overhead line
- Permanent office and control room
- Site access and parking.
 - Access and upgrade from existing site access off Holbrook Road.
 - Onsite car parking.

The Project would also include temporary works areas (construction compound, laydown areas, storage, drainage and bunding), water access through a Council-managed standpipe and the following permanent ancillary infrastructure:

- Security fencing
- Water tank
- Pumpable sewage holding tank
- Control room
- Diesel generator
- Landscaping

The Development Footprint covers an area of approximately 13.85 ha.

Construction activities would be carried out over an estimated 12- 15 month period and include the following works:

- Installation of environmental controls, earthworks and any drainage requirements, construction of concrete hardstands, and civil works. Summarised as follows:
 - Earth works (cut and fill, grading and compacting)
 - Establishment of external access road
 - Removal of existing fences
 - Cleaning and levelling the ground for buildings and structures
 - Excavating cable trenches
- Delivery of BESS infrastructure
- Installation of BESS infrastructure (containerised units, transformer, ring main units, switch room, control room, operations and maintenance) and electrical works.
- BESS testing works.

Operation would include management of BESS by two full-time staff, with an additional influx of staff required for refurbishment works. The BESS would primarily be operated remotely, which would require additional remote full-time staff. Ad-hoc contractors local to the region would also be required for ongoing maintenance including weed and pest control.

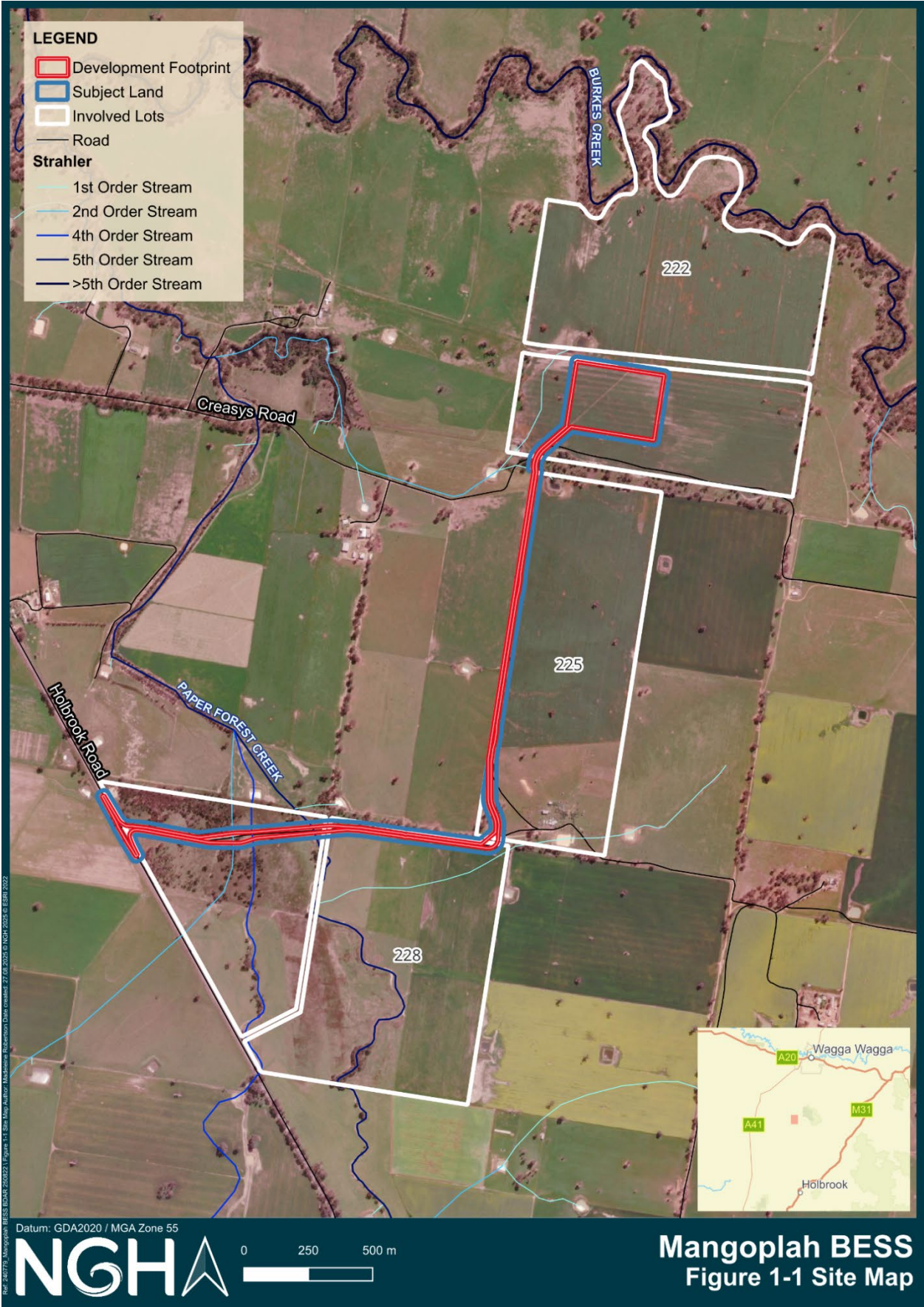


Figure 1-1 Site Map (NGH, 2025)

1.2. Biodiversity Offsets Scheme entry

The project has been classified as a State Significant Development (SSD), therefore assessment under the Biodiversity Offset Scheme (BOS) automatically applies.

1.2.1. Study aims

The aim of this BDAR is to assess the native vegetation and fauna and flora habitats in the Subject Land and Development Footprint. This assessment is then utilised to make recommendations to avoid and minimise impacts to native and threatened flora, fauna and habitats as a result of the proposed project. Where avoid and minimise mitigation measures cannot be implemented, the BDAR describes offset requirements under the *Biodiversity Conservation Act 2016* (BC Act). Throughout this BDAR, the biodiversity matters identified in the SEARs have been addressed (DPHI, 2024). This includes cumulative impact assessment on biodiversity values, addressed in section 8.2 and section 8.4, and assessment of aquatic habitat and threatened aquatic species, addressed in sections 3.2, 8.2 and 8.3 of this BDAR and in the Environmental Impact Statement (NGH, 2025).

1.3. Excluded impacts

The Draft Native Vegetation Regulatory Map (NVR Map) shows the Subject Land contains Category 1 - exempt land. Clause 6.8(3) of the BC Act states that prescribed impacts (as defined in clause 6.1 of the Biodiversity Conservation Regulation 2017 (BC Regulation) are still required to be assessed on Category 1 - exempt land (as defined in Part 5A of the LLS Act). While this mapping is in Draft form, assessors must make their own assessment of land categorisation with supporting evidence.

Areas mapped as Category 1 - exempt land in the NVR Map contained agricultural crops during NGH's field inspection. No Land Categorisation Assessment (LCA) has been undertaken. Instead, these have been included in the BDAR as exotic vegetation. All land within the Subject Land was included for assessment under the BOS. Therefore, there are no excluded impacts for this project.

1.4. Matters of national environmental significance

This BDAR includes an assessment of impacts to protected matters listed under the federal *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act). This assessment includes use of the Protected Matters Search Tool (PMST) to determine potential species and communities occurring within the locality, and targeted surveys across the site to detect the presence of these entities or their habitats. Entities known or considered likely to occur have been included in the impact assessment, and Assessments of Significance (AoSs) have been prepared where there is the potential for impacts to determine the significance of impacts to these entities. Please refer to Appendix E for the completed AoSs.

A referral (EPBC2025/10220) under the EPBC Act to the Federal Department of Climate Change, Energy, the Environment and Water (DCCEEW) was undertaken, with the referral decision determining the proposal is not a controlled action. No additional assessment is required for Matters of National Environmental Significance (MNES). Refer to Appendix E for a summary of MNES details provided throughout the BDAR.

1.5. Information sources

Table 1-1 below provides a list of information sources used in this report.

Table 1-1 Information sources used in the preparation of this report

Information	Source
Australia's Interim Biogeographic Regionalisation for Australia (IBRA) bioregions and subregions (DAWE, 2020)	www.environment.gov.au/land/nrs/science/ibra/australias-bioregions-maps
Mitchell Landscapes (DECCW, 2002)	Department of Environment and Climate Change NSW (DECC, 2002). Descriptions for NSW (Mitchell) Landscapes, Version 3
NSW Biodiversity Assessment Method (BAM) calculator (BAM-C)	DPIE, NSW Biodiversity Accredited Assessor System (https://customer.lmbc.nsw.gov.au/assessment/s/userlogin?startURL=%2Fassessment%2Fs%2F)
NSW BioNet Threatened Biodiversity Database Collection NSW BioNet Atlas NSW BioNet Vegetation Classification	NSW Government 2025 Accessed online via login at www.bionet.nsw.gov.au
BioNet vegetation classification database (OEH, 2021)	Accessed online via login at: www.environment.nsw.gov.au/NSWVCA20PRapp/default.aspx
Biodiversity Assessment Method 2020 (DPE, 2020)	www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity-offsets-scheme/accredited-assessors/biodiversity-assessment-method-2020
Department of Primary Industries (DPI) profiles of threatened species, populations, ecological communities and key threatening processes (DPI, n.d.)	www.dpi.nsw.gov.au/fishing/threatened-species/what-current
Directory of Important Wetlands (DCCEEW, 2021)	www.environment.gov.au/water/wetlands/australian-wetlands-database/directory-important-wetlands
Transitional Native Vegetation Regulatory Mapping	https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=NVRMap
NSW Biodiversity Values Map and Threshold Tool (NSW Gov, n.d.)	www.lmbc.nsw.gov.au/Maps/index.html?viewer=BOSETMap
NSW Flora Online (PlantNET, n.d.)	https://plantnet.rbgsyd.nsw.gov.au
NSW SEED Mapping Portal (SEED, 2025)	https://geo.seed.nsw.gov.au/Public_View/index.html?viewer=Public_View&locale=en-AU
NSW Soil and Land Information (eSpade, n.d.)	www.environment.nsw.gov.au/eSpade2WebApp#

Information	Source
NSW State Vegetation Type Mapping (SVTM (NSW Department of Planning, Industry and Environment, 2025))	https://datasets.seed.nsw.gov.au/dataset/nsw-state-vegetation-type-map
NSW Threatened Species Profiles (NSW Government) (OEH, 2025)	https://www.environment.nsw.gov.au/threatenedSpeciesApp/
NSW Threatened Species Scientific Committee final determinations (DPE, n.d.)	www.environment.nsw.gov.au/topics/animals-and-plants/threatened-species/nsw-threatened-species-scientific-committee/determinations/nsw-threatened-species-scientific-committee-final-determinations
NSW Woody Vegetation Extent (SEED, 2025)	https://datasets.seed.nsw.gov.au/dataset/nsw-woody-vegetation-extent-2011c0569
Protected Matters Search Tool (Commonwealth Government) (DCCEEW, 2025)	www.environment.gov.au/epbc/protected-matters-search-tool
Species Profiles and Threats (SPRAT) Database (Commonwealth Government) (DCCEEW, 2025)	http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl
Aerial imagery of historical land use	Sourced from Google Earth and NSW Spatial Services Delivery
Aerial imagery of Development Footprint	Provided by SREA

2. Methods

2.1. Site context methods

2.1.1. Landscape features

Landscape features were identified and evaluated using desktop methods such as aerial imagery, information sources identified in section 1.5, available Geographic Information System (GIS) layers as well as field surveys. Field surveys were undertaken in September 2024 as an initial site inspection to ground-truth native and exotic vegetation in the Subject Land as well as an overview of landscape features and vegetation in the Assessment Area.

2.1.2. Native vegetation cover

Native vegetation cover was calculated using a 1500 metre (m) radius around the proposed BESS site, and a 500 m buffer around the access road leading from Holbrook Road to the BESS site.

A combination of desktop and field based methods were utilised to classify areas within the Subject Land and Assessment Area as native or non-native vegetation. In defining potential native vegetation, an initial analysis of the following datasets were undertaken:

- State Vegetation Type Mapping (SVTM) (SEED, 2025).
- NSW Woody Vegetation Extent 2011 - published 2015 (SEED, 2025). This dataset is used to identify areas of extant remnant vegetation and cleared lands/non-woody vegetation.
- Aerial Imagery from a variety of sources, referenced above in Table 1-1.

Native vegetation in the Assessment Area was determined using NSW SVTM with adjustments made for local observations made during field work. Preliminary mapping of vegetation community boundaries was undertaken through the analysis of the above datasets. Analysis of aerial imagery was used to identify areas of disturbance (e.g. buildings, vehicle tracks, dams, power lines) and vegetation structure to determine whether areas are assigned as native or exotic. Areas within the Assessment Area that were unable to be accessed during field surveys were mapped conservatively as native if there was no evidence to prove otherwise (i.e. cropped paddocks, infrastructure). Satellite imagery was used to map paddock trees as native vegetation. Native vegetation cover calculations were determined using GIS processing tools.

2.2. Native vegetation, threatened ecological communities and vegetation integrity methods

2.2.1. Existing information

A desktop investigation was undertaken to assist with gaining knowledge of existing native vegetation within the Subject Land. The following searches were completed:

- Biodiversity Values Mapping and areas of outstanding biodiversity value were conducted. The search was conducted on 7th April 2025.
- BioNet species sightings records of threatened flora, fauna and ecological communities listed under the BC Act. The search was conducted on 7th April 2025 within a 10 km radius surrounding the Subject Land.

- Protected Matters Search Tool (PMST) for threatened species and populations listed under the EPBC Act. The search was conducted on 7th April 2025 within a 10 km radius surrounding the Subject Land.

Searches were conducted utilising the following sources to assist with Plant Community Type (PCT) classification:

- NSW Sharing and Enabling Environmental Data (SEED) Mapping Portal
- BioNet Vegetation Classification Tool (BioNet)
- NSW State Vegetation Type Map (SVTM).

2.2.2. Mapping native vegetation extent

Native vegetation within the Subject Land was reviewed at a desktop level using desktop mapping from a range of sources including:

- NSW State Vegetation Type Mapping (SVTM)
- BioNet vegetation classification database
- Vegetation data collected during site assessments.

Initial Field surveys were undertaken by a BAM Accredited Assessor and Ecologist in September 2024. This was to ground-truth the native vegetation extent within the Subject Land using rapid assessment points, step point transects and vegetation integrity plots (VI plots). Thirty-three Rapid Assessment Points (RAPs), one-step point transect and three VI plots were undertaken.

RAPs were undertaken across multiple areas within the Subject Land, capturing the range of condition classes present. Additional RAPs were recorded incidentally at observed areas of interest during the field investigation. Each RAP site was recorded on a Geographical Positioning System (GPS) enabled Android tablet using data collection software. The following information was collected (based on observing a 100 m radius around the point):

- The three most dominant flora species in the upper, middle and lower stratum of vegetation (where present).
- The percent native cover of all endemic species (%) for each vegetation stratum was also estimated.
- Landscape features such as landform and soil type were also observed and recorded.
- A photo was taken of each RAP site to provide a visual representation of the data recorded at each point.

In addition to RAPs, one 100 m step point transects was also conducted within the Subject Land, noting;

- The percentage of native groundcovers compared to exotic groundcover and bare ground or rock over 100 m (step point at every 1 m tape interval), expressed as a percentile.

The step point transect was undertaken to determine the percentage of native groundcover consistent with the transect-intercept method outlined in the NSW Government Interim Grassland and other Groundcover Assessment Method document (OEH, 2017).

Three VI plots (20m x 50m in accordance with the BAM) were undertaken to get initial data on flora species and vegetation structure to inform the likely PCTs present in the subject land and their condition.

Following field surveys, vegetation mapping was refined, including confirming areas of native vegetation and Plant Community Types (PCTs) present within the Subject Land to create a more accurate and comprehensive map. Field data was analysed to determine preliminary vegetation condition classes and presence of any Threatened Ecological Communities (TEC).

Woody vegetation was classified as native unless otherwise indicated by field surveys (e.g. exotic planted Pine trees). The Conservation Programs, Heritage and Regulation (CPHR) group was engaged and attended a site inspection in March 2025 to confirm vegetation presence within the Subject Land.

2.2.3. Plot-based vegetation survey

Additional field verification (ground-truthing) of the preliminary vegetation mapping was completed through a combination of random meanders and VI plots to confirm PCTs, their condition and the presence of any TECs. Ground-truthing involved confirming the vegetation structure, dominant canopy species, native diversity and condition of different vegetation communities. VI plot locations were selected by considering landform features (e.g. slopes or plains), dominant canopy species and vegetation formations (e.g. grassy woodland). VI plots and random meanders were conducted by an ecologist and a BAM-accredited ecologist in September 2024 and April 2025. The aim of this field work was to assess the vegetation visually and conduct an acceptable number of VI plots in the representative PCTs observed onsite in accordance with BAM 2020 (DPE, 2020).

Sampling locations were chosen in areas that were representative of each vegetation community that may occur within the Subject Land. These locations were chosen by taking into consideration landform features (i.e. slopes or plains), dominant canopy species and vegetation formations (i.e. grassy woodland).

VI plots were conducted over a 20 x 50 m area to assess vegetation function, including a 20 x 20 m plot to assess vegetation composition and structure, in accordance with the BAM (DPE, 2020). One plot (plot 6) was adapted due to area constraints and included a 10 x 100 m area that assessed vegetation function, and a 10 x 40 m plot to assess vegetation composition and structure. Each VI plot also included analysis of five plots (1 x 1 m quadrat area) for percentage cover of litter, bare ground, rocks and cryptogams. Data was collected in accordance with the BAM by an accredited BAM assessor.

PCT identification was based on:

- Vegetation formation and Class (Keith D. , 2004)
- Most dominant native species present inside 20 x 20 m floristics plots;
- Canopy species observed in similar and adjoining landforms to the Subject Land (where absent in plots); and
- Landform elements and soil types,
- Location in the Interim Biogeographic Regionalisation for Australia (IBRA) subregion and distribution using the BioNet Vegetation Classification Database.

Once PCTs were identified, they were then stratified into different condition states based on vegetation structure, native /exotic composition and VI scores generated by the BAM-C. Further information on PCT justification is provided in section 4.2.

2.2.4. Vegetation integrity survey

PCTs confirmed to occur within the Subject Land were mapped using VI plot data taken from the plot-based vegetation survey. VI plots were used to further delineate PCTs into specific zones based on vegetation formation, structure and condition and extrapolated out in combination with on-site vegetation stratification and aerial imagery. Vegetation was classified as low condition for VI scores between 15-36, moderate condition between 36-50, and good condition above 50.

The number of VI plots undertaken per zone was based on Table 3 & Section 4.3.4 of the BAM (2020). As eight VI plots were used to inform planning to avoid and minimise impacts, VI plots undertaken by NGH exceed the minimum required by the BAM in most zones.

2.3. Threatened flora survey methods

2.3.1. Review of existing information

Searches for threatened flora species records were undertaken using BioNet (OEH, 2021) and the PMST (DCCEEW, 2025) within a 10 km radius of the Development Footprint to determine previous or potential occurrences within or near the Subject Land. Background searches for threatened species were conducted on 7 April 2025.

2.3.2. Habitat constraints assessment

In conjunction with VI plots and general site inspections, a habitat constraints assessment was undertaken across the Subject Land to identify habitat features which may provide potential habitat for any threatened flora species.

2.3.3. Field surveys

Parallel transects were conducted on foot in accordance with the Surveying Threatened Plants and their habitats Guidelines under the BAM (NSW DPIE, 2020). This involved walking parallel lines spaced 10 metres apart, with each traverse assuming at least 5 metres of visual coverage on either side of the walked line. Cropped areas that had no native vegetation were not surveyed in the targeted flora surveys, as they were considered unlikely to support threatened flora species. Refer to Figure 5 1, Figure 5 2 and Figure 5 3 for threatened flora survey locations.

Targeted field survey for Small Scurf-pea (*Cullen parvum*) and Ausfeld's Wattle were conducted from 22-24 January 2025.

Targeted field surveys for the following species were completed between 16-17 September 2025 by two NGH ecologists:

- Ausfeld's Wattle (*Acacia ausfeldii*)
- Leafless Indigo (*Indigofera efoliata*)
- Pine Donkey Orchid (*Diuris tricolor*)
- Prasophyllum sp. Wybong (*Prasophyllum sp. Wybong*)
- Sand-hill Spider Orchid (*Caladenia arenaria*)
- Silky Swainson-pea (*Swainsona sericea*)
- Small Purple-pea (*Swainsona recta*)
- Tarengo Leek Orchid (*Prasophyllum petilum*)

Ausfeld's Wattle was surveyed in January 2025 which is outside the recommended survey period. This survey aimed to detect any shrubs or wattle species that were present in the Subject Land. No shrubs were present across the subject land and the species was considered not to occur. However, a secondary survey was undertaken in September 2025 during its correct survey period, when the species would be flowering. The survey for Ausfeld's wattle was undertaken during stick nest surveys where all wooded areas were surveyed.

The remaining forbs were surveyed during flora transects. The number of flora species was considered manageable to search during one transect. The groundcover was open, sparse and with minimal flora diversity. Any forbs present were easily detectable. *Prasophyllum sp. Wybong* and *P. petilum* are considered to be the same species for NSW regulatory purposes (DCCEEW, 2023). The two *Swainsona* species have

similar characteristics used for detection. Thus, no more than five genera were surveyed during the one transect.

Parallel field traverse methodology will be undertaken during November 2025 to survey for the following species. Surveys will be timed to coincide with the optimal seasonal period for detectability.

- A Speargrass (*Austrostipa wakoolica*)
- Euphrasia arguta (*Euphrasia arguta*)
- Yass Daisy (*Ammobium craspedioides*)

2.4. Threatened fauna survey methods

2.4.1. Review of existing information

Searches for threatened fauna species records were undertaken using BioNet (OEH, 2021) and the PMST (DCCEEW, 2025) within a 10 km radius of the Development Footprint to determine previous or potential occurrences within or near the Subject Land. Background searches for threatened species were conducted on 7 April 2025.

2.4.2. Habitat constraints assessment

In conjunction with VI plots and other targeted threatened species surveys, a habitat constraints assessment was undertaken across the Subject Land to identify habitat features which may provide potential habitat for any threatened fauna species. Habitat features such as hollow bearing trees, fallen logs, waterways/dams and nest trees were recorded to indicate the potential presence of specific threatened fauna.

2.4.3. Field surveys

Targeted surveys were completed between 22-24 January 2025 for the Gang-gang Cockatoo (*Callocephalon fimbriatum*) and Square-tailed Kite (*Lophoictinia isura*) by two NGH ecologists.

Targeted field surveys for the following species were completed between 19-24 March 2025 by two NGH ecologists:

- Barking Owl (*Ninox connivens*)
- Brush-tailed Phascogale (*Phascogale tapoatafa*)
- Bush Stone-curlew (*Burhinus grallarius*)
- Eastern Pygmy Possum (*Cercartetus nanus*)
- Key's Matchstick Grasshopper (*Keyacris scurra*)
- Koala (*Phascolarctos cinereus*)
- Masked Owl (*Tyto novaehollandiae*)
- Southern Myotis (*Myotis macropus*)
- Squirrel Glider (*Petaurus norfolcensis*).

Targeted surveys were completed between 11-20 August 2025 for the South-eastern Glossy Black-Cockatoo (*Calyptrorhynchus lathami lathami*) and Sloane's Froglet (*Crinia sloanei*) by two NGH ecologists.

Targeted surveys were completed between 16-19 September 2025 for the Pink Cockatoo (*Lophochroa leadbeateri*), Superb Parrot (*Polytelis swainsonii*), Little Eagle (*Hieraaetus morphnoides*) and White-bellied Sea Eagle (*Haliaeetus leucogaster*).

The following species will be assessed in spring 2025 using expert reports:

- Golden Sun Moth (*Synemon plana*)
- Striped Legless Lizard (*Delma impar*)

Pink-tailed Legless Lizard was excluded from requiring further assessment based on its predicted distribution model not occurring within the Subject Land. Refer to correspondence from species expert in Appendix D. Methods involved for targeted fauna surveys differed depending on species and are described below.

Gang-Gang Cockatoo

The Gang-gang Cockatoo was surveyed at eight locations containing suitable habitat of Hollow-Bearing Trees (HBTs) along the existing access track by two NGH ecologists. Each location was surveyed for 20 minutes, within four hours prior to sunset or four hours after sunrise. Each location was surveyed four times, twice prior to sunset and twice after sunrise. Each survey location for the Gang-Gang Cockatoo is shown in Figure 5-5, Figure 5-6 and Figure 5-7. Due to a technical error with the GPS recording, no track logs for the surveys were recorded and only the start and end points have a GPS location.

Brush-tailed Phascogale, Squirrel Glider and Eastern Pygmy Possum

For arboreal mammals including the Brush-tailed Phascogale, Squirrel Glider and Eastern Pygmy Possum, the camera trap method was utilised (DCCEEW (Cwth), 2011). Trail cameras were placed facing the tree, where approximately 1-2 m of bait mixture consisting of equal parts honey, oat and peanut butter was held in a metal tea strainer. These were deployed by two NGH ecologists on branches of or in close proximity to HBTs to maximise chances of detection. Ten camera traps were placed across the site and were deployed for a minimum of 28 nights. Deployment occurred on 19 March 2025 and 20 March 2025. Baits were replenished after 14 days. Equipment was collected on 30 April 2025.

Spotlighting transects were completed in March 2025 across four locations, where a total of 1.85 km was covered. This was calculated as per the BAM guidelines, where 2 x 200m transects are required for every 5 ha of suitable habitat. Approximately 19.95 ha of suitable habitat within the Assessment Area was calculated. From this area, a length of at least 1.6 km was divided into 4 transects and allocated to areas that contained suitable habitat. Each transect was walked twice by two NGH ecologists over two separate nights. Each survey location for the Brush-tailed Phascogale, Squirrel Glider and Eastern Pygmy Possum is shown in Figure 5-8, Figure 5-9 and Figure 5-10.

Bush Stone-curlew, Barking Owl and Masked Owl

For the Bush Stone-curlew, Barking Owl and Masked Owl, call-playback in conjunction with spotlighting was undertaken by two NGH ecologists. Call-playback was undertaken in a specific order to maximise chances of detection, and to avoid interference. Bush Stone-curlew call-playback was undertaken first at each site, followed by Barking Owl and the Masked Owl as the last broadcast. Call playback was conducted at night. At each site, the following call-playback methodology was utilised, as per the recommended survey guidelines. For the Barking Owl and Masked Owl, methodology included:

1. 10 minutes of listening and observation.
2. Pre-recorded calls were broadcast for 15 seconds, followed by at least 30 seconds of listening time. Watching in conjunction with listening was undertaken. This broadcast and listening sequence was completed for 15 minutes at each site.
3. At the end of the sequence, 10 minutes of spotlighting searches were undertaken.

Owl species were surveyed using these methods in three survey locations across the site, spaced at least one kilometre apart so as not to interfere with disturbing existing owls. Call-playback was undertaken for a total of 45 minutes at each site for each species. This effort was repeated over a total of six nights.

Bush Stone-curlew was surveyed at two of these locations - in the northern area closer to the BESS site and in the western area closer to the entry/exit access point. Methodology included 10 minutes of initial listening

and observation, followed by five minutes of broadcasting pre-recorded calls, then 10 minutes of listening time. At the end of the sequence, 10 minutes of spotlighting searches were undertaken. Each survey location for the Bush Stone-curlew, Barking Owl and Masked Owl is shown in Figure 5-8, Figure 5-9 and Figure 5-10.

Key's Matchstick Grasshopper

Key's Matchstick Grasshopper was surveyed for in areas of predominantly native grass, most notably in Red Grass (*Bothriochloa macra*) using a pouter and nets. Random meander in a parallel-type pattern was adopted when undertaking searches to maximise area coverage. Surveys were conducted during daytime, when the temperature was above 18 degrees Celsius with clear skies. Surveys for Key's Matchstick Grasshopper were completed by two NGH ecologists for two hours each per location, repeated over four days, therefore totalling 16 hours of survey effort throughout the Subject Land. The survey location for the Key's Matchstick Grasshopper is shown in Figure 5-8, Figure 5-9 and Figure 5-10.

Southern Myotis

Southern Myotis was surveyed using Anabat ultrasonic recording devices. This methodology follows the passive acoustic detection method, where the microphone of the Anabat is directed over pools of water along creeks, rivers or other waterbodies, in areas of potential habitat (DPIE, 2021). Six farm dams containing water were present within 200 m of the Development Footprint, providing potential habitat for Southern Myotis. A total of five devices were deployed, one at each of the farm dams containing water and one Anabat located between two dams within 75 m of each other. Anabats were deployed for a total of 4 nights at each location, totalling 16 hours of survey effort per site. The survey location for the Southern Myotis is shown in Figure 5-8, Figure 5-9 and Figure 5-10.

Square-tailed Kite

Square-tailed Kite was surveyed by two NGH ecologists in January 2025, conducting stick nest searches in areas of potential suitable habitat. Potential habitat included areas with large trees, both in patches of native vegetation and occurring as scattered trees. The survey location for the Square-tailed Kite is shown in Figure 5-5, Figure 5-6 and Figure 5-7.

Koala

Koalas were surveyed by two NGH ecologists in accordance with the BAM survey guidelines for the Koala (*Phascolarctos cinereus*) (DPE, 2022). The Spot Assessment Technique (SAT) was undertaken at five sites across the Subject Land. The SAT technique is an indirect survey methodology, assessing the presence of koala scat within a prescribed search area. Survey locations were selected using a grid with 150 m spacing, since suitable habitat was equal or less than 50 ha in size. The total number of SAT sites was determined by dividing the approximate number of hectares by 2.25. The following SAT protocol was adhered to when undertaking searches:

1. The marked SAT tree was located and identified as the centre tree.
2. The nearest 29 trees to the centre tree were identified within suitable habitat.
3. A radial search for koala scat was undertaken beneath each of the 30 identified trees, extending one metre from the base of each tree.
4. Searches began with a brief inspection of undisturbed litter and grass within the one metre search area. Disturbance by hand of the litter was completed where scats were not detected.
5. Searches at each tree concluded when the search time of two minutes ceased with no koala scat detected.

Each SAT site was conducted for a total of 60 minutes for a total of 300 minutes across the Subject Land.

Spotlighting transects were also completed for the Koala. Spotlighting transects were completed in March 2025 across four locations, where a total of 1.85 km was covered. This was calculated as per the BAM

guidelines, where 2 x 200m transects are required for every 5 ha of suitable habitat. Approximately 19.95 ha of suitable habitat within the Assessment Area was calculated. From this area, a length of at least 1.6 km was divided into 4 transects and allocated to areas that contained suitable habitat. Each transect was walked twice by two NGH ecologists over two separate nights. The survey location for the Koala is shown in Figure 5-8, Figure 5-9 and Figure 5-10.

South-eastern Glossy Black-Cockatoo

Surveys for the South-eastern Glossy Black-Cockatoo were conducted by two NGH ecologists across five days at four locations using random meander (area searches) in areas of potential suitable habitat. Surveys were undertaken on foot, with ecologists walking slowly through areas of suitable habitat containing hollow-bearing trees. Surveys involved visual observations using binoculars, listening for diagnostic calls or feeding activity in the canopy. Four afternoon surveys were completed within two hours prior to sunset, with each location surveyed for 20 minutes. One additional morning survey was conducted on the 20 August 2025, within two hours after sunrise using the same methodology at all locations. The survey location for the South-eastern Glossy Black-Cockatoo is shown in Figure 5-11, Figure 5-12 and Figure 5-13.

Sloane's Froglet

Call-playback surveys for Sloane's Froglet were undertaken by two NGH ecologists over four nights, including three consecutive nights and one night the following week. Call-playback surveys were conducted in conjunction with spotlighting. Surveys were conducted between 6pm and 11pm at multiple locations containing suitable habitat within the Subject Land and directly adjacent to the Subject Land. Survey locations included five dams and eight vegetated depressions adjacent to access tracks and culverts. At each site, the following call playback methodology was utilised, consistent with recommended survey guidelines:

1. Five minutes of active listening.
2. Pre-recorded calls were broadcast for two minutes, followed of active listening for response calls for 2 minutes.
3. At the end of the call playback sequence, five minutes of active searching of vegetation and water edges using spotlights.

Calls were recorded and submitted to FrogID for confirmation during both active listening periods. Surveys were repeated every 50m along transects around dams and depressions to maximise coverage.

One farm dam was unable to be accessed for targeted surveys for Sloane's Froglet as it occurred on a neighbouring property on an uninvolved lot. This dam is located around 80 m north of the Development Footprint. Surveys, involving call playback were undertaken along the fence line of the Project Lot, around 30 m south from the neighbouring farm dam. Although the dam could not be accessed directly, the Sloane's Froglet surveys were considered adequate due to the surveys being undertaken within hearing distance of the dam and any frogs calling would have been heard. Habitat around the farm dam was degraded and lacked aquatic or fringing vegetation and thorough surveys were undertaken in better condition habitat in the waterbodies and vegetated depressions south of the inaccessible farm dam. Each survey location for the Sloane's Froglet is shown in Figure 5-11, Figure 5-12 and Figure 5-13.

Pink Cockatoo, Superb Parrot

Surveys for the Pink Cockatoo and Superb Parrot were conducted by two NGH ecologists over four days across the Subject Land, using random meander (area search) methods in areas of potential suitable habitat. Surveys were carried out on foot within three hours after first light on the mornings of 16, 17, and 19 September, with an additional afternoon survey on 18 September that continued until sunset. Each ecologist walked through the centre of tree groups, moving to a new location after at least 20 minutes, and continued surveying until 10 am or sunset, spending at least two hours surveying the entire Subject Land. Each survey location for the Pink Cockatoo and Superb Parrot is shown in Figure 5-14, Figure 5-15 and Figure 5-16.

Little Eagle, White-bellied Sea Eagle

Little Eagle and White Bellied Sea Eagle were surveyed by two NGH ecologists in September 2025, conducting stick nest searches in areas of potential suitable habitat. Potential habitat included areas with large trees, both in patches of native vegetation and occurring as scattered trees. Each survey location for the Little Eagle and White-bellied Sea Eagle is shown in Figure 5-14, Figure 5-15 and Figure 5-16.

Weather conditions during field surveys are shown in Table 2-1 below.

Table 2-1 Environmental conditions during field surveys

Survey undertaken (e.g. method / targeted species)	Date	Temp (°C)		Rainfall (mm)	Max Wind Gust (km/h)	Other conditions relevant to the species
		Min	Max			
Preliminary vegetation assessment VI plots Step-point Cat1 assessment (step-point transect)	03/09/2024	-0.2	15.3	0	48 NW	
Gang-gang Cockatoo – Diurnal HBT surveys and stick nest searches Small Scurf-pea – 5m parallel flora transects Grey Headed Flying-fox – Camp searches Ausfelds Wattle – <i>Acacia</i> searches Booroolong Frog – Habitat searches Square-tailed Kite – Stick nest searches	22/01/2025	20.0	33.4	0	41 SW	
Gang-gang Cockatoo – Diurnal HBT surveys and stick nest searches Small Scurf-pea – 5m parallel flora transects	23/01/2025	18.6	29.0	0	52 ENE	
Gang-gang Cockatoo – Diurnal HBT surveys and stick nest searches	24/01/2025	13.5	30.5	0.6	39 SW	No rainfall on site, only in the Wagga Wagga

Survey undertaken (e.g. method / targeted species)	Date	Temp (°C)		Rainfall (mm)	Max Wind Gust (km/h)	Other conditions relevant to the species
		Min	Max			
Small Scurf-pea – 5m parallel flora transects						region
Brush-tailed Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap Southern Myotis - Anabat ultrasonic detection Bush-Stone Curlew, Barking Owl, Masked Owl – call playback and spotlighting	19/03/2025	16.8	34.7	0	59 SSE	
Southern Myotis - Anabat ultrasonic detection Koala, Brush-tailed Phascogale, Eastern Pygmy Possum – spotlighting transects Brush-tailed Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap Key's Matchstick Grasshopper – pouter and netting habitat search Bush-Stone Curlew, Barking Owl, Masked Owl – call playback and spotlighting	20/03/2025	20.0	31.2	1.6	39 WSW	Rainfall on site, delaying Koala SATs
Koala, Brush-tailed Phascogale, Eastern Pygmy Possum – spotlighting transects Brush-tailed Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap Key's Matchstick Grasshopper – pouter and	21/03/2025	19.9	28.8	7.0	35 W	No rainfall on site, only in the Wagga Wagga region

Survey undertaken (e.g. method / targeted species)	Date	Temp (°C)		Rainfall (mm)	Max Wind Gust (km/h)	Other conditions relevant to the species
		Min	Max			
netting habitat search Bush-Stone Curlew, Barking Owl, Masked Owl – call playback and spotlighting Southern Myotis - Anabat ultrasonic detection						
Koala, Brush-tailed Phascogale, Eastern Pygmy Possum – spotlighting transects Brush-tailed Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap Key's Matchstick Grasshopper – pouter and netting habitat search Bush-Stone Curlew, Barking Owl, Masked Owl – call playback and spotlighting Southern Myotis - Anabat ultrasonic detection	22/03/2025	12.1	28.0	0.2	30 NNW	No rainfall on site, only in the Wagga Wagga region
Koala, Brush-tailed Phascogale, Eastern Pygmy Possum – spotlighting transects Brush-tailed Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap Key's Matchstick Grasshopper – pouter and netting habitat search Bush-Stone Curlew, Barking Owl, Masked Owl – call playback and spotlighting Southern Myotis - Anabat	23/03/2025	15.7	31.3	0	31 E	

Survey undertaken (e.g. method / targeted species)	Date	Temp (°C)		Rainfall (mm)	Max Wind Gust (km/h)	Other conditions relevant to the species
		Min	Max			
ultrasonic detection						
Bush-Stone Curlew, Barking Owl, Masked Owl – call playback and spotlighting Koala – SATs Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap	24/03/2025	18.5	32.0	0	24 SE	
Brush-tailed Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap	25/03/2025	20.5	32.4	0	37 E	
Brush-tailed Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap	26/03/2025	17.2	32.6	0	28 SE	
Brush-tailed Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap	27/03/2025	18.6	31.8	0	N/A	
Brush-tailed Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap	28/03/2025	18.9	27.6	N/A	43 ENE	
Brush-tailed Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap	29/03/2025	17.4	25.7	4.0	33 ENE	
Brush-tailed Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap	30/03/2025	14.9	28.9	0.2	39 E	
Brush-tailed Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited	31/03/2025	16.0	28.0	0	37 SE	

Survey undertaken (e.g. method / targeted species)	Date	Temp (°C)		Rainfall (mm)	Max Wind Gust (km/h)	Other conditions relevant to the species
		Min	Max			
camera trap						
VI plots Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap	01/04/2025	12.5	26.9	0	28 SW	
Brush-tailed Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap	02/04/2025	11.6	26.4	0	30 WNW	
Brush-tailed Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap	03/04/2025	6.1	27.1	0	41 W	
Brush-tailed Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap	04/04/2025	8.6	25.2	0	33 W	
Brush-tailed Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap	05/04/2025	6.9	22.1	0	46 SW	
Brush-tailed Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap	06/04/2025	2.3	22.7	0	43 W	
Brush-tailed Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap	07/04/2025	5.9	22.1	0	44 SW	
Brush-tailed Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap	08/04/2025	4.9	25.2	0	26 NNE	
Brush-tailed Phascogale, Eastern Pygmy Possum,	09/04/2025	8.1	27.1	0	30 NW	

Survey undertaken (e.g. method / targeted species)	Date	Temp (°C)		Rainfall (mm)	Max Wind Gust (km/h)	Other conditions relevant to the species
		Min	Max			
Squirrel Glider – Baited camera trap						
Brush-tailed Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap	10/04/2025	13.4	28.6	0	30 W	
Brush-tailed Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap	11/04/2025	9.4	30.6	0	33 ENE	
Brush-tailed Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap	12/04/2025	11.4	29.8	0	30 E	
Brush-tailed Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap	13/04/2025	12.8	29.1	0	22 E	
Brush-tailed Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap	14/04/2025	9.9	30.7	0	30 SSW	
Brush-tailed Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap	15/04/2025	16.4	27.3	0	41 E	
Brush-tailed Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap	16/04/2025	8.8	26.2	0	33 SW	
Brush-tailed Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap	17/04/2025	7.5	26.6	0	28 SW	
Brush-tailed Phascogale, Eastern Pygmy Possum,	18/04/2025	9.1	28.4	0	20 W	

Survey undertaken (e.g. method / targeted species)	Date	Temp (°C)		Rainfall (mm)	Max Wind Gust (km/h)	Other conditions relevant to the species
		Min	Max			
Squirrel Glider – Baited camera trap						
Brush-tailed Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap	19/04/2025	10.4	29.6	0	33 N	
Brush-tailed Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap	20/04/2025	12.7	29.6	0	43 N	
Brush-tailed Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap	21/04/2025	10.6	21.4	2.4	33 W	
Brush-tailed Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap	22/04/2025	9.3	26.2	0	37 S	
Brush-tailed Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap	23/04/2025	12.6	26.6	0	44 ENE	
Brush-tailed Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap	24/04/2025	15.3	27.3	0	37 E	
Brush-tailed Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap	25/04/2025	12.7	27.6	0	30 E	
Brush-tailed Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap	26/04/2025	14.0	25.0	0	33 NE	
Brush-tailed Phascogale, Eastern Pygmy Possum,	27/04/2025	12.9	25.7	0	22 SE	

Survey undertaken (e.g. method / targeted species)	Date	Temp (°C)		Rainfall (mm)	Max Wind Gust (km/h)	Other conditions relevant to the species
		Min	Max			
Squirrel Glider – Baited camera trap						
Brush-tailed Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap	28/04/2025	9.5	25.3	0	33 NNW	
Koala – SATs Brush-tailed Phascogale, Eastern Pygmy Possum, Squirrel Glider – Baited camera trap	29/04/2025	10.9	23.1	0	28 WNW	
Koala - SATs	30/04/2025	11.9	20.3	0	30 SSE	
South-eastern Glossy Black-Cockatoo – Area searches Sloane’s Froglet – Call playback, spotlighting	11/08/2025	2.4	16.6	0	26 E	
South-eastern Glossy Black-Cockatoo – Area searches Sloane’s Froglet – Call playback, spotlighting	12/08/2025	1.4	16.8	0	26 E	
South-eastern Glossy Black-Cockatoo – Area searches Sloane’s Froglet – Call playback, spotlighting	13/08/2025	6.7	13.6	2.8	15 WNW	Rainfall preceded the surveys, providing optimal conditions for frog surveys.
South-eastern Glossy Black-Cockatoo – Area searches Sloane’s Froglet – Call playback, spotlighting	19/08/2025	-2.3	16.9	0	20 E	
South-eastern Glossy Black-Cockatoo – Area searches	20/08/2025	1.6	18.2	0	37 E	
Pink Cockatoo, Superb Parrot	16/09/2025	9.9	18.9	0	33 NNW	

Survey undertaken (e.g. method / targeted species)	Date	Temp (°C)		Rainfall (mm)	Max Wind Gust (km/h)	Other conditions relevant to the species
		Min	Max			
– Area searches Little Eagle, White Bellied Sea Eagle – Stick nest searches Targeted Flora – 10m parallel flora transects						
Pink Cockatoo, Superb Parrot – Area searches Targeted Flora – 10m parallel flora transects	17/09/2025	9.0	15.8	0.2	37 WNW	
Pink Cockatoo, Superb Parrot – Area searches	18/09/2025	0.7	17.7	0	19 NE	
Pink Cockatoo, Superb Parrot – Area searches	19/09/2025	4.9	19.0	0	48 NNE	

Weather data unavailable for Mangoplah – sourced from Wagga Wagga AMO (station 072150) (Bureau of Meteorology, 2025) and Kapooka (Defence) (station 074272) (Bureau of Meteorology, 2025).

2.5. Limitations

Although sufficient survey methods and effort were undertaken to identify all hollow-bearing trees within the Subject Land, it is possible that some hollows in the canopy of large trees may not have been detected. Ground surveys for HBTs are inherently limited as inspections of hollows are conducted to eyesight level only. Research shows that rapid ground surveys are likely to underestimate hollow frequency compared to climbing surveys (Harper, McCarthy, van der Ree, & Fox, 2004). However, this research also confirmed that ground surveys do provide an efficient and relatively reliable method for assessing hollow abundance (Harper, McCarthy, van der Ree, & Fox, 2004).

Chambers of hollows were not measured during the ground surveys, therefore causing a limitation to the assessment of hollow suitability for threatened fauna species with specific hollow requirements.

Low condition areas within the Subject Land have been highly modified and subjected to past clearing, historic and current grazing, trampling, herbicide application and other agricultural activities. Both low and moderate condition areas within the Subject Land may contain a reduced number of species that would normally be observed within each PCT, due to the land use activities resulting in habitat modification.

Groundcover assessment of floristics can vary greatly depending on climatic influences and season at time of survey. Paddocks inspected had grazing pressure by livestock and native cover abundance could change over time following variation in climate and grazing regimes.

Due to a large volume of rainfall on March 20th 2025, Koala SATs were conducted primarily on one day (24th March 2025), with the remainder completed on 29-30 April 2025.

Assumption of presence of multiple threatened species limits the accuracy of analysis. However, targeted threatened species surveys will be undertaken during each species' breeding season in 2025.

3. Site context

3.1. Assessment area

The Assessment Area is defined as the area of land within the 1500 m buffer zone surrounding the Subject Land for site-based development, or 500 m buffer for linear development. For the Project, the Assessment Area has been calculated by buffering the BESS site by 1500 m and an additional 500 m buffer around the linear access road, leading from Holbrook Road to the BESS site. The Assessment Area includes a total area of 1137 ha (Figure 3-4).

3.2. Landscape features

Landscape features identified within the Subject Land and Assessment Area are shown on

Figure 3-3 and Figure 3-4, respectively. A discussion of relevant landscape features is provided below.

The Subject Land occurs within the Wagga Wagga City Local Government Area (LGA). The Subject Land is dominated by open cropping and grazing areas, as is the immediate surrounding land use. Surrounding landscape is characterised by rural farmlands and agricultural fields used for cropping and grazing with scattered remnant paddock trees. Remnant woodlands occur along creek lines of Burkes Creek and Paper Forest Creek. Topography is flat, with an elevation of 275 m above sea level, remaining consistent in a westerly direction for more than 5 km. Towards the east, elevation increases within the boundary of Livingstone National Park approximately 3.2 km North East of the Subject Land. The highest elevation of Livingstone National Park is 480 m above sea level. Multiple farm dams in various conditions occur within the Assessment Area, however none fall within the Subject Land. There are two mapped dams, connected by an ephemeral 1st Order stream on the western section of the Assessment Area. Multiple ephemeral streams occur through the access track component of the Subject Land including 1st, 2nd and 4th Strahler Order streams.

3.2.1. IBRA bioregions and IBRA subregions

Interim Biogeographical Regionalisation for Australia (IBRA) bioregions are geographically distinct bioregions based on common climates, geology, landforms and native vegetation (Thackway & Cresswell, 1995). There are 89 bioregions within Australia. The Subject Land falls across one IBRA Bioregion. This is:

- NSW South Western Slopes.

The NSW South Western Slopes Bioregion occurs across a large area of 8,681,126 ha. This bioregion has been extensively cleared for agricultural use. The NSW South Western Slopes Bioregion covers foothills and isolated ranges comprising the lower inland slopes of the Great Dividing Range, extending through southern New South Wales to western Victoria. Vegetation in this bioregion consists of wet/damp sclerophyll forests, peppermint forests and box/ironbark woodlands (Environment Australia, 2000).

The Subject Land falls across one IBRA subregion. This is:

- Inland Slopes

This subregion is characterised by landforms that are composed of steep, hilly and undulating ranges and granite basins. This bioregion covers 4,795,121 ha. The geology of the Inland Slopes subregion comprises Ordovician to Devonian folded and faulted sedimentary sequences with inter-bedded volcanic rocks and large areas of intrusive granites. Occasional basalt caps and confined river valleys with terrace remnants also

occur. Shallow stony soils occur on steep slopes, texture contrast soils grading from red subsoils are present on upper slopes to yellow subsoils on lower slopes. Alluvial sands, loams and clays also occur. Vegetation occurring in this subregion includes open forests and woodlands (SEED, 2024). Across suitable landscapes, the following vegetation communities occur:

- Blakely's Red Gum on lower slopes, merging west to Yellow Box, Grey Box and White Cypress Pine.
- Red Stringybark is present on upper slopes with Black Cypress Pine, Kurrajong, Red Ironbark, White Gum, White Box, Yellow Box.
- Rough-barked Apple on flats with River Oak occurs on upper tributaries and River Red Gum occurs on lower and larger streams.

IBRA regions and subregions are displayed in

Figure 3-3.

3.2.2. Rivers, streams, estuaries and wetlands

The aquatic environment within the Subject Land is sparse. No wetlands occur within 10 km of the Subject Land. An EPBC Act protected matters search was completed on 7 April 2025 and did not identify any Ramsar wetlands that may be impacted by the Project. Multiple ephemeral streams occur through the subject land including 1st, 2nd and 4th Strahler Order streams; however, it is likely that surface water flow only would be present during periods of heavy rainfall with farm dams capturing additional run-off. Twenty-seven farm dams occur across the Assessment Area, however none fall within the Subject Land. Farm dams are generally in poor condition, lacking fringing or aquatic vegetation and regularly trampled by livestock (Figure 3-1). Location of rivers, streams, estuaries and wetlands within the Subject Land are shown in Figure 3-4.

Two main watercourses in the assessment area are Paper Forest Creek and Burkes Creek.

Paper Forest Creek

Paper Forest Creek is the only named waterway within the Subject Land. It is a 5th Strahler Order stream, which crosses the access road corridor through Lot 228 DP754557. It is also mapped as Key Fish Habitat (KFH) under the NSW *Fisheries Management Act 1994* (FM Act) and classified as Biodiversity Values (BV), as biodiverse riparian land (SEED, 2022). Paper Forest Creek joins into Burkes Creek to the north of the Assessment Area, east of the township of Mangoplah. All other stream orders that intersect with the Subject Land are branches from this creek. These watercourses are ephemeral and were mostly dry during field surveys, however, *Juncus spp.* and other wetland species were found along the flow path through the Subject Land. This suggests that in large rainfall events, water does flow through these areas of the Subject Land. Aquatic habitat was noted at culverts along the access road during the September 2024 site visit (Figure 3-2).

Burkes Creek

Burkes Creek runs along the northern boundary of the northern lot 222 (DP754557), which continues down and travels out of the eastern side of the Assessment Area. It is located approximately 610 m north of the Subject Land. Riparian woodland vegetation is present along Burkes Creek throughout the Assessment Area.



Figure 3-1 Farm Dams within the Subject Land (NGH, 2025)



Figure 3-2 Aquatic habitat along road culverts of Paper Forest Creek (NGH, 2025)

3.2.3. Habitat connectivity

Existing habitat connectivity within the Assessment Area is highly fragmented due to past clearance and associated agricultural land use activities. Roadside vegetation along Holbrook Road provides patchy connectivity between the Subject Land and Paper Forest Road, approximately 2 km south of the Subject Land.

Two patches of woodland are present close to the entrance to the Project Site via Holbrook Road. These patches of woodland run along the north and south sides of the access road within the Subject Land and

provide connectivity to Paper Forest Creek. Native grasses are established in close proximity to the access road on both sides and connects to each of these patches. However, canopy connectivity is quite limited as these patches are fragmented, with scattered trees along the creek line providing 'stepping stone' connectivity for highly mobile species.

Within the northern section of the Subject Land, a patch of mature *Eucalyptus spp.* are present. This patch connects with a thin line of native trees that continue to connect to Riparian vegetation along Burkes Creek which eventually connects to Livingstone National Park around 3km to the east of the Assessment Area.

3.2.4. Karst, caves, crevices, cliffs, rocks or other features of geological significance

There are no karsts, caves, crevices, cliffs, rocks or other areas of geological significance within or adjacent to the Subject Land. This was determined through the several site visits from 2024 to 2025 in conjunction with aerial imagery.

3.2.5. Areas of outstanding biodiversity value

Areas of Outstanding Biodiversity Value (AOBVs) are special areas identified as having irreplaceable biodiversity value of critical importance to the state of NSW, Australia or internationally (DCCEEW (NSW), 2024). AOBVs are declared by the Minister of the Environment and placed on the AOBV public register.

AOBVs sites currently listed on the public register are:

- Gould's Petrel – critical habitat declaration
- Little Penguin population in Sydney's North Harbour – critical habitat declaration
- Mitchell's Rainforest Snail in Stotts Island Nature Reserve – critical habitat declaration
- Wollemi Pine – critical habitat declaration.

None of these declared areas occurs within the Subject Land.

3.2.6. NSW (Mitchell) landscapes

The Subject Land falls across two Mitchell landscapes. These are the Wonga Hills and Ranges, and the Brokong Plains (

Figure 3-3). Descriptions of each Mitchell landscape are provided below.

Brokong Plains (NSS Lower Slopes)

Brokong Plains occurs on Quaternary alluvial plains, with a general elevation of 170 m and local relief of <10 m. Soils are red-brown texture-contrast. This Mitchell landscape has been extensively cleared and cropped. Vegetation formerly included Grey Box (*Eucalyptus microcarpa*), Yellow Box (*Eucalyptus melliodora*), Blakely's Red Gum (*Eucalyptus blakelyi*) and White Cypress Pine (*Callitris glaucophylla*) woodland to open forest (DECCW, 2002).

Wonga Hills and Ranges (NSS Upper Slopes)

Wonga Hills and Ranges occurs on Ordovician siltstone, slate, quartzite and phyllite. Landscape morphology includes rolling hills, low rises and ridges, with a general elevation of 250 to 370 m and local relief of 50 m. Occurs on stony, thin red and brown texture-contrast soils merging to yellow harsh texture-contrast soils on valley floors. Subsoil contains high salinity levels, with brackish flows in small creeks. Vegetation includes woodlands of Tumbledown Red Gum (*Eucalyptus dealbata*), Red Stringybark (*Eucalyptus macrorhyncha*) and

Grey Box (*Eucalyptus microcarpa*) on slopes. Yellow Box (*Eucalyptus melliodora*), White Box (*Eucalyptus albens*) and occasional Blakely's Red Gum (*Eucalyptus blakelyi*) occurs on flats with Kangaroo Grass (*Themeda triandra*) and Plains Grass (*Austrostipa aristiglumis*) (DECCW, 2002).

The dominant Mitchell Landscape within the Subject Land is Wonga Hills and Ranges. This was entered into the BAM-C.

3.2.7. Additional landscape features identified in SEARs

No additional landscape features were identified in the SEARs.

3.2.8. Soil hazard features

The NSW Acid Sulfate Soils Risk mapping (eSpade, 2024), Environmental Protection Authority contaminated lands records (eSpade, 2024), and Environmental Planning Instrument – Salinity mapping (eSpade, 2024) were reviewed, and no mapped areas or records were identified within the Subject Land.

3.3. Native vegetation cover

The first step in calculating native vegetation cover was to use GIS processing tools to buffer a 1500 m radius around the BESS compound. Another 500 m radius buffer was produced for the access road leading from Holbrook Road to the proposed BESS site. Native vegetation cover inside this buffer was determined through vegetation stratification and field survey according to the BAM 2020. Native vegetation outside the Subject Land was determined using NSW State Native Vegetation mapping (SEED, 2025) and the NSW Woody Vegetation Extent model (SEED, 2025) with adjustments made for local observations made during field work.

The native vegetation cover within the Assessment Area was calculated to be 173.53 ha out of a total area of 1137.17 ha. This equates to 15.26% native vegetation coverage and this number was entered into the BAM-C for this assessment. See Figure 3-4 showing native vegetation cover. Table 3-1 summaries the extent of native vegetation cover within the assessment area.

Table 3-1 Native vegetation cover in the assessment area

Native Vegetation Cover	Amount
Total area of native vegetation cover (ha)	173.53 ha
Total Assessment Area (ha)	1137.17 ha
Percentage of native vegetation cover (%)	15.26
Class (0-10, >10-30, >30-70 or >70%)	>10-30 %

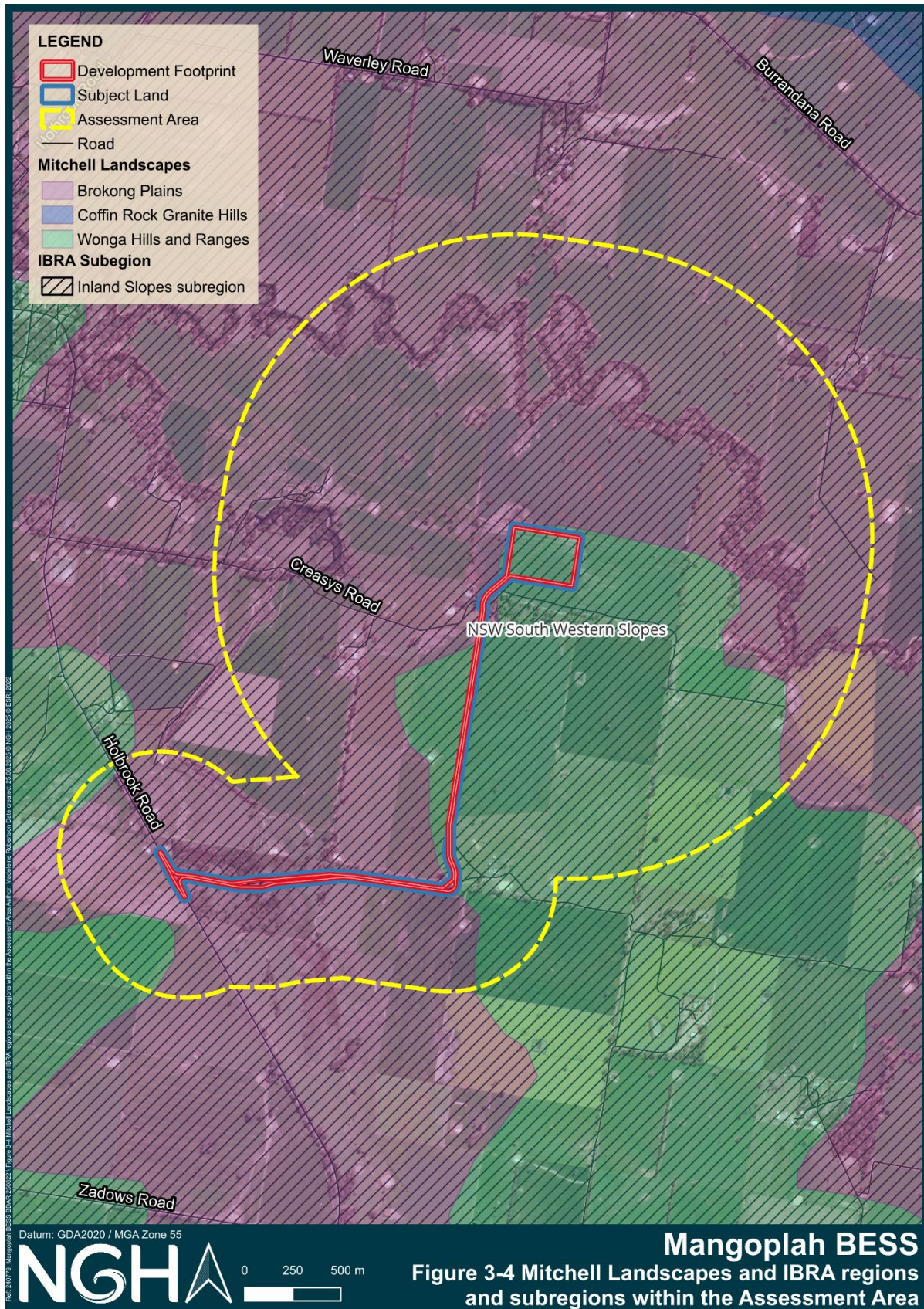


Figure 3-3 Mitchell Landscapes and IBRA regions and subregions within the Assessment Area (NGH, 2025)

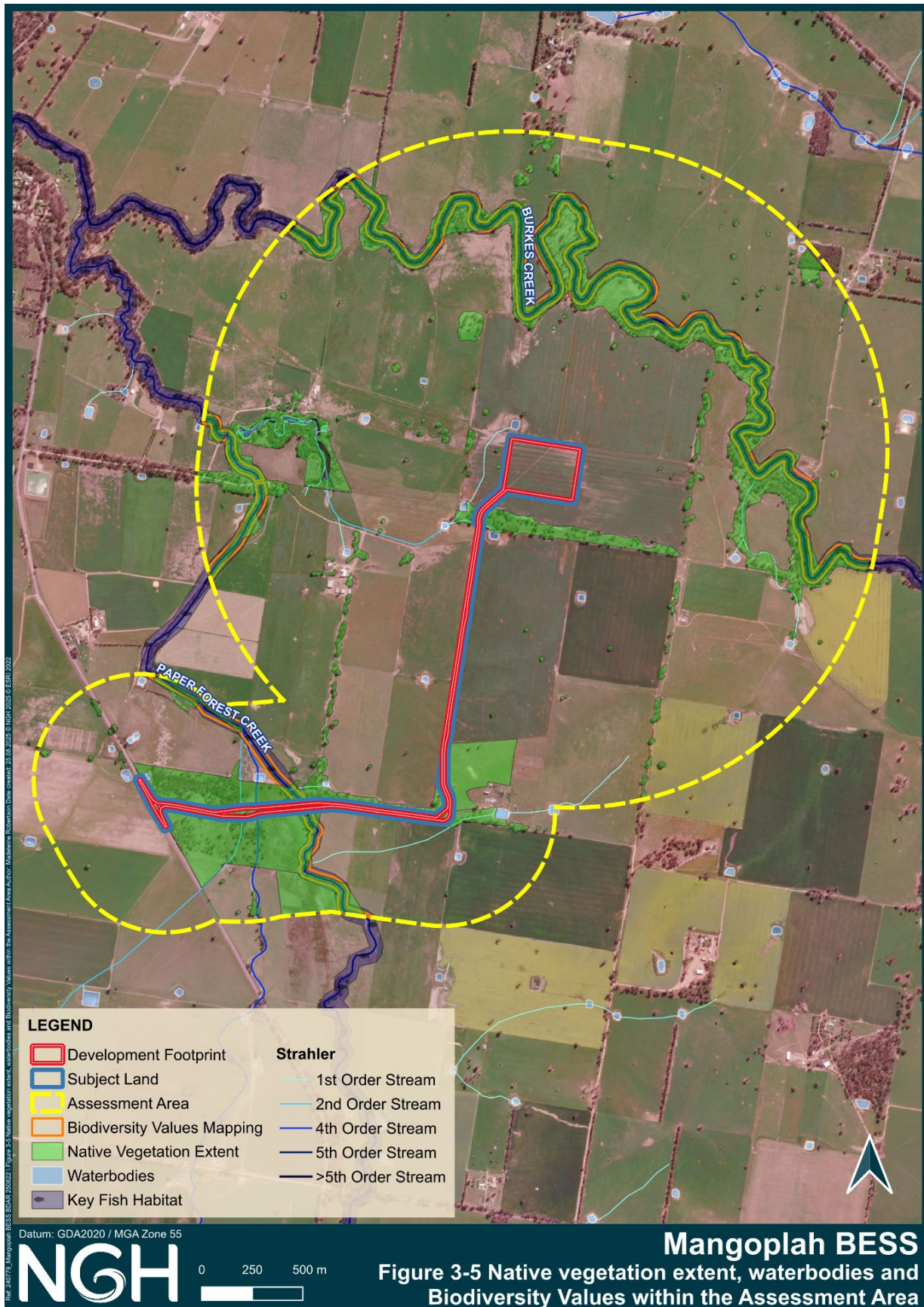


Figure 3-4 Native vegetation extent, waterbodies and Biodiversity Values within the Assessment Area (NGH, 2025)

4. Native vegetation

4.1. Native vegetation extent

Native vegetation extent refers to areas of vegetation assessed under the BAM. The Subject Land has been predominantly cleared for agricultural use including cropping, and livestock production. Some native vegetation in the form of woodland and grassland remains within the Subject Land, although condition varies across the site. The access road corridor traverses through native vegetation in the form of open grassy woodland off Holbrook Road and near the access point to the BESS site. Aerial imagery and site visits conducted by NGH ecologists determined 8.56 ha of native vegetation across the Subject Land.

4.1.1. Changes to the existing native vegetation mapping

A search was undertaken of the DCCEEW BioNet Vegetation Classification Tool (BioNet) database and the NSW SEED Mapping Portal to assess existing vegetation mapping information within the Subject Land.

Prior to field surveys, NSW SVTM (SEED, 2025) showed PCT 277 *Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion* as occurring in patches along the western end of the Subject Land along the existing access track as well as a small patch in the northern end of the Subject Land, just South of the BESS site. The SVTM showed 2.37 ha of PCT 277 across the Subject Land.

Additional areas of derived native grasslands were identified during field surveys (VI plots), and some areas mapped as PCT 277 were considered more likely to meet the characteristics of PCT 76 *Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions* based on the dominance of Grey Box (*Eucalyptus macrocarpa*) as a canopy species. Therefore, PCT 277 *Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion* and PCT 76 *Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions* were confirmed present within the Subject Land. Refinements of the native vegetation mapping were made following field inspections.

4.1.2. Areas that are not native vegetation

Areas that are already disturbed, including roads (dirt and gravel), farm buildings, residential dwellings and sheds, were excluded from native vegetation extent mapping. The BESS location is wholly exotic, dominated by cropped Canola (*Brassica sp.*) and exotic groundcover. Similarly, part of the access road corridor in the North traverses through cropped Canola fields (Figure 4-1 and Figure 4-2). Cropped areas were excluded from native vegetation extent mapping. The areas of non-native vegetation comprise 18.95 ha in the Subject Land. Excluding cropping areas, non-native vegetated areas (assessed by VI plot 2) were dominated by Barley Grass (*Hordeum sp.*) and Ryegrass (*Lolium sp.*). The complete list of species is detailed in Appendix D.



Figure 4-1 Non-native vegetation (Canola) adjacent to access track in northern section of Subject Land (NGH, 2025)



Figure 4-2 Non-native vegetation (Canola) at the proposed BESS site in the northern section of the Subject Land (NGH, 2025)

4.2. Plant community types (PCTs)

4.2.1. PCT Overview

Two PCTs were identified with the Subject Land. Vegetation within the Subject Land has been assessed as aligning with the BioNet Vegetation Classification PCTs identified within Table 4-1 and their extent is shown in Figure 4-8, Figure 4-9 and Figure 4-10. Detailed descriptions of each PCT are provided in the following subsections.

Table 4-1 PCTs identified within the Subject Land and Development Footprint

PCT ID	PCT name	Subject Land area (ha)	Development Footprint area (ha)
277	Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	7.09	1.85
76	Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	1.46	0.15
Total Area		8.55	2.00

4.2.2. PCT 76

Overview

Table 4-2 PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions

PCT ID	76
PCT name	Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Vegetation formation	Grassy Woodlands
Vegetation class	Floodplain Transition Woodlands
Percent cleared value in NSW (%)	92
Extent within Subject Land (ha)	1.46

This community typically consists of tall woodland (up to 25 m high), dominated by Western Grey Box (*Eucalyptus microcarpa*). It is often the sole tree species, occupying 90% of the canopy cover, however; other trees present may include Yellow Box (*Eucalyptus melliodora*), White Cypress Pine (*Callitris glaucophylla*) and minor Buloke. Shrubs are absent or sparse and include *Dodonaea viscosa* subsp. *cuneata*, *Acacia buxifolia*, *Acacia acinacea*, *Acacia hakeoides*, *Bursaria spinosa*. Grazing has eliminated shrubs in many places where this PCT occurs. A mid-dense or dense grass ground cover is typically composed of *Austrodanthonia caespitosa*, *Austrodanthonia setacea*, *Austrostipa scabra* subsp. *falcata*, *Paspalidium*

constrictum, *Themeda australis*, *Austrostipa aristiglumis*, *Aristida behriana* and *Elymus scaber* var. *scaber* along with introduced grass species such as *Bromus* spp., *Vulpia* spp. and *Hordeum leporinum*. The small scrambler *Einadia nutans* subsp. *nutans* is usually present. Native forbs typically include *Sida corrugata*, *Wahlenbergia gracilis*, *Vittadinia gracilis*, *Dianella porracea*, *Oxalis perennans* and *Chamaesyce drummondii* (OEH, 2025).

Within the Subject Land, this PCT is comprised of one canopy tree species including Grey Box (*Eucalyptus microcarpa*). This PCT is interspersed between patches of Yellow Box (*Eucalyptus melliodora*) in a transitional zone to PCT 277 however the distribution of Grey Box is distinct enough to be a separate PCT in the Subject Land. Shrubs are absent from PCT 76 in the Subject Land. A drainage line was located within this PCT and connected to culverts that passed underneath the existing access track. Phalaris (*Phalaris aquatica*) and Juncus (*Juncus* spp.) were present in this area. Native ground cover species within PCT 76 in the Subject Land are comprised of Common Couch (*Cynodon dactylon*), Windmill Grass (*Chloris truncata*), Red Grass (*Bothriochloa macra*), Small-flowered Wallaby Grass (*Rytidosperma setaceum*), Clustered Lovegrass (*Eragrostis elongata*), Common Wheatgrass (*Elymus scaber*), *Chamaesyce drummondii* and *Oxalis perennans*. Introduced ground cover species include Onion Grass (*Romulea roea* var. *australis*), Catsear (*Hypochaeris radicata*), Flaxleaf Fleabane (*Conyza bonariensis*), Stinkgrass (*Eragrostis cilianensis*), Paspalum (*Paspalum dilatatum*), St Johns Wort (*Hypericum perforatum*) and Pointed Toadflax (*Kickxia elatine*).

Condition states

PCT 76 occurred in two condition states across the Subject Land. These are;

PCT 76 Moderate Condition : This zone occurs as mid to tall woodland, dominated by Western Grey Box (*Eucalyptus microcarpa*). A mid stratum is absent, with a native-dominated understory. The average cover of native grasses in this zone is approximately 10-50%. Some livestock grazing and trampling was evident.

PCT 76 Low Condition derived Grassland: This zone occurs as low condition grassland with evidence of heavy grazing and trampling, however it does contain high native ground cover, averaging 71% cover.



Figure 4-3 Image of PCT 76 moderate condition woodland in the Subject Land (NGH, 2025)



Figure 4-4 Image of PCT 76 low condition derived grassland in the Subject Land (NGH, 2025)

Justification of PCT selection

The occurrence of this PCT is consistent with the information provided for the community in the BioNet Vegetation Classification database (landform position, species assemblage, dominant canopy species, location). The disturbed nature of the vegetation provided a low diversity of native species in the ground layer and shrub layer and so PCT selection was based on canopy species and landform position distinct from the surrounding vegetation of PCT 277. This PCT is surrounded by patches of Yellow Box (*Eucalyptus melliodora*) and Blakely's Red Gum (*Eucalyptus Blakleyi*) in a transitional zone to PCT 277. The vegetation change was only slight however the distribution of Grey Box as a dominant canopy species within the wetter areas of the floodplain of Paper Forest Creek was considered distinct enough to be a separate PCT in the Subject Land.

PCT 76 was determined using the following information;

- The dominance of Grey Box (*Eucalyptus microcarpa*) in the upper stratum,
- Open grassy woodland formation,
- Grassy understorey containing *Chloris truncata* and *Rytidosperma setaceum*,
- Located on wide floodplain of Paper Forest Creek,
- Grey-brown clay loam soils,
- Located in Inland Slopes/NSW South Western Slopes IBRA bioregions.

These characteristics align with the attributes for PCT 76 in the BioNet Vegetation Classification database and was considered the best match for the vegetation community.

Alignment with Threatened Ecological Communities

PCT 76 is aligned with two Threatened Ecological Communities (TECs):

- *Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions* - Endangered (BC Act).
- *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia* – Endangered (EPBC Act).

Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions was confirmed within the Subject Land. TECs are discussed further in section 4.4.

4.2.3. PCT 277

Overview

Table 4-3 PCT 277 Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion

PCT ID	277
PCT name	Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Vegetation formation	Grassy Woodlands
Vegetation class	Western Slopes Grassy Woodlands
Percent cleared value in NSW (%)	94
Extent within Subject Land (ha)	7.09

This community typically consists of tall woodland (up to approximately 20 m high), dominated by Blakely's Red Gum (*Eucalyptus blakelyi*) and Yellow Box (*Eucalyptus melliodora*). Dominance of canopy species varies, and can either be absent in some locations grading into Apple Box (*Eucalyptus bridgesiana*), Long-leaved Box (*Eucalyptus goniocalyx*) and rarely Western Grey Box (*Eucalyptus microcarpa*). Shrubs are typically sparse or absent and may include *Acacia dealbata*. Ground cover may be dense to sparse depending on rainfall and is typically dominated by grass species including *Poa sieberiana*, *Bothriochloa macra*, *Aristida ramosa*, *Themeda australis*, *Austrodanthonia* spp. and *Austrostipa* spp. Forbs typically include *Vittadinia cuneata*, *Chrysocephalum apiculatum* and *Sida corrugata*.

Within the Subject Land this PCT is comprised of a mixed canopy and grassland. The tree canopy species comprise Blakely's Red Gum (*Eucalyptus blakelyi*) and Yellow Box (*Eucalyptus melliodora*). One Kurrajong (*Brachychiton populneus*) was also observed in this PCT. The mid stratum, including shrubs, are absent from PCT 277 within the Subject Land. Ground cover of PCT 277 is sparse throughout the Subject Land. Native ground cover species present include Red Grass (*Bothriochloa macra*), Common Couch (*Cynodon dactylon*), Ringed Wallaby Grass (*Rytidosperma caespitosum*), Windmill Grass (*Chloris truncata*), Hairy Joyweed (*Alternanthera nana*), Caustic Weed (*Chamaesyce drummondii*), Knob Sedge (*Carex inversa*), Jersey Cudweed (*Pseudognaphalium luteoalbum*), Swamp Dock (*Rumex brownii*), Tall Sedge (*Carex appressa*), Star Cudweed (*Euchiton involucratus*), Wahlenbergia (*Wahlenbergia* sp.), Small Crumbweed (*Dysphania pumilio*), Setaria (*Setaria* sp.), Plains Grass (*Austrostipa aristiglumis*), Climbing Saltbush (*Einadia nutans*),

Juncus usitatus, *Oxalis perennans*, Blue Crowfoot (*Erodium crinitum*). Some native *Juncus* (*Juncus sp.*), Water Couch (*Paspalum distichum*) and exotic *Phalaris* (*Phalaris aquatica*) was also present near drainage lines. Dominant introduced ground cover species include Oats (*Avena spp.*), Ryegrasses (*Lolium spp.*), Goose Grass (*Eleusine tristachya*), Barley Grass (*Hordeum leporinum*) and *Paspalum* (*Paspalum dilatatum*). Additional introduced species include St Johns Wort (*Hypericum perforatum*), Spear Thistle (*Cirsium vulgare*), Pointed Toadflax (*Kickxia elatine*), Wireweed (*Polygonum aviculare*), Flaxleaf Fleabane (*Conyza bonariensis*), Small-flowered Mallow (*Malva parviflora*), Red-flowered Mallow (*Modiola caroliniana*), Onion Grass (*Romulea rosea var. australis*), Curled Dock (*Rumex crispus*), Sheep Sorrel (*Rumex acetosella*), Pennyroyal (*Mentha pulegium*), Catsear (*Hypochaeris radicata*), Bathurst Burr (*Xanthium spinosum*), Common Crowfoot (*Erodium cicutarium*), Patterson's's Curse (*Echium plantagineum*), a Clover (*Trifolium sp.*), Saffron Thistle, (*Carthamus lanatus*), Pennyroyal (*Mentha pulegium*), Small Nettle (*Urtica urens*), White Horehound (*Marrubium vulgare*), Black-berry Nightshade (*Solanum sanguinalis*), Crab Grass (*Digitaria sanguinalis*), Lamb's Tongues (*Plantago lanceolata*), Capeweed (*Arctotheca calendula*) and Haresfoot Clover (*Trifolium arvense*).

Condition states

PCT 277 occurred in three condition states across the Subject Land. These are;

PCT 277 Good Condition: This zone occurs as a tall open woodland, dominated by Blakely's Red Gum (*Eucalyptus blakelyi*) and Yellow Box (*Eucalyptus melliodora*). An absent mid stratum and sparse lower stratum occurs, dominated by native grasses including Red Grass (*Bothriochloa macra*), Common Couch (*Cynodon dactylon*) and Windmill Grass (*Chloris truncata*). Regenerative woodland was apparent throughout this zone with many seedlings present. Some grazing was evident, however lower stratum vegetation was in higher condition than the moderate condition PCT zone. This zone has the highest condition score for PCT 277 and was assigned as good condition.

PCT 277 Moderate Condition: This zone occurs as an open woodland, dominated by Blakely's Red Gum (*Eucalyptus blakelyi*) and Yellow Box (*Eucalyptus melliodora*). An absent mid stratum and exotic dominated understory occurs, dominated by exotic grasses including Oats (*Avena spp.*), Ryegrass (*Lolium spp.*), Barley Grass (*Hordeum leporinum*), Small-flowered Mallow (*Malva parviflora*) and *Phalaris* (*Phalaris aquatica*). The understory shows a high level of disturbance from grazing, machinery and other agricultural activities.

PCT 277 Low Condition Derived Grassland: This zone occurs as a derived native grassland with evidence of heavy grazing and trampling, and a high abundance of exotic species. There is no canopy or shrub layer. Native species such as Common Couch (*Cynodon dactylon*), Red Grass (*Bothriochloa macra*), Windmill Grass (*Chloris truncata*) and Wallaby Grass (*Rytidosperma spp.*) are interspersed between exotic grasses such as *Paspalum* (*Paspalum dilatatum*) and *Phalaris* (*Phalaris aquatica*).



Figure 4-5 Image of PCT 277 good condition woodland along the access track in the Subject Land (NGH, 2025)



Figure 4-6 Image of PCT 277 moderate condition woodland in the Subject Land (NGH, 2025)



Figure 4-7 Image of PCT 277 low condition derived grassland in the Subject Land (NGH, 2025)

Justification of PCT selection

The occurrence of this PCT is consistent with the information provided for the community in the BioNet Vegetation Classification database (landform position, species assemblage, dominant canopy species, location). The disturbed nature of the vegetation provided a low diversity of native species in the ground layer and shrub layer and so PCT selection was based on canopy species and landform elements. This community occurred on the slightly higher micro-elevation of the Subject Land and graded into PCT 76 that occurred on lower parts of the floodplain of Paper Forest Creek. The vegetation and elevation change was only slight however the distribution of Yellow Box and Blakely's Red Gum as a dominant canopy species was considered distinct enough to be a separate PCT in the Subject Land.

PCT 277 was determined using the following information;

- The dominance of Yellow Box (*Eucalyptus melliodora*) and Blakely's Red Gum (*Eucalyptus blakelyi*) in the upper stratum,
- Absence of shrubs and open grassy woodland formation,
- Grassy understory containing Ringed Wallaby Grass (*Rytidosperma caespitosum*), Red Grass (*Bothriochloa macra*), Windmill Grass (*Chloris truncata*), and Common Couch (*Cynodon dactylon*).
- Located on valley flats and
- Grey-brown clay loam soils,
- Located in Inland Slopes/NSW South Western Slopes IBRA bioregions.

These characteristics align with the attributes for PCT 277 in the BioNet Vegetation Classification database and was considered the best match for the vegetation community.

Alignment with TECs

PCT 277 is associated with two 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* - Critically Endangered (BC Act).
- *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* – Critically Endangered (EPBC Act).

Both of these TECs are present within the Subject Land. TECs are discussed further in section 4.4.



Figure 4-8 PCTs within the Subject Land – Map 1 of 3 (NGH, 2025)

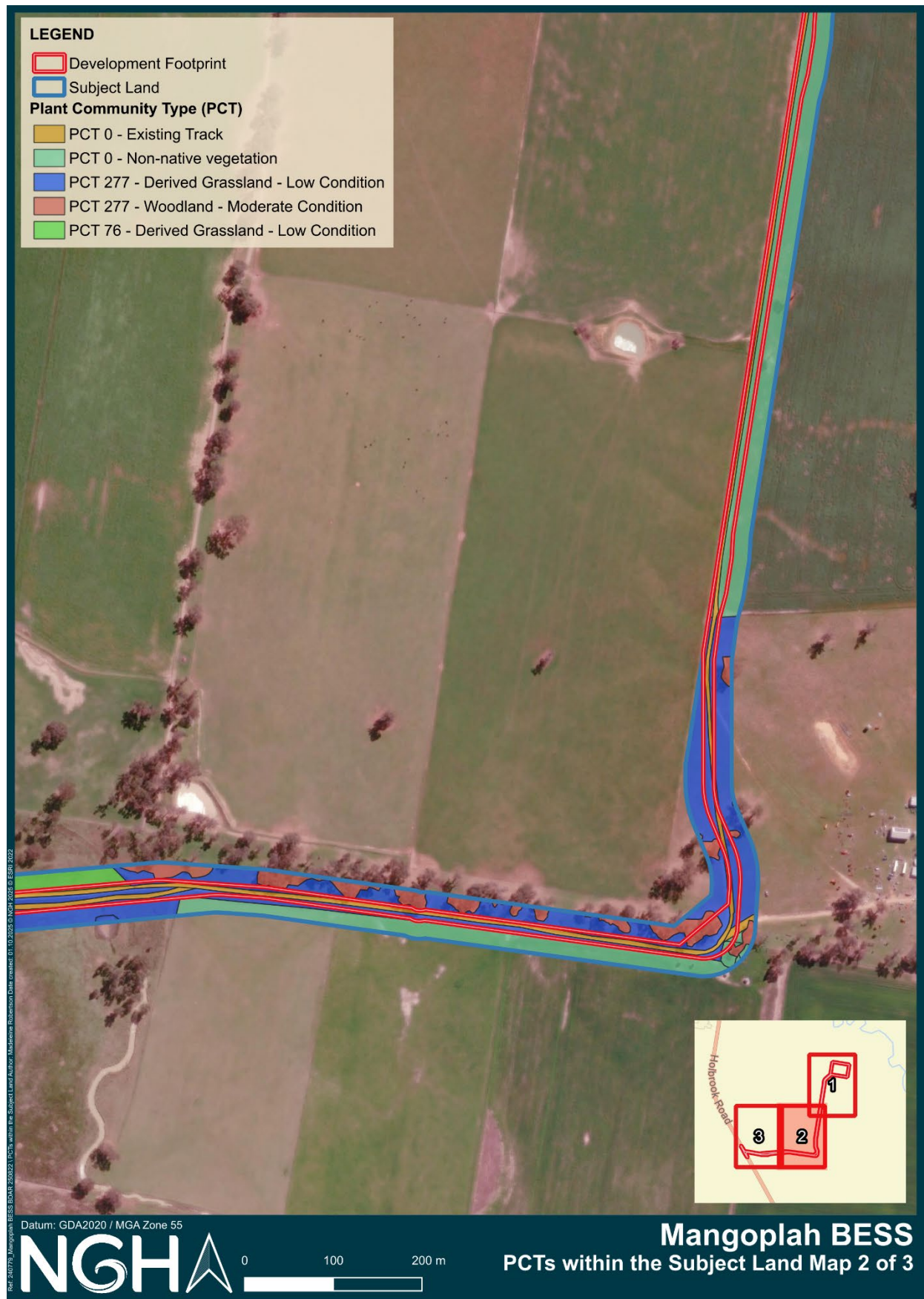


Figure 4-9 PCTs within the Subject Land - Map 2 of 3 (NGH, 2025)

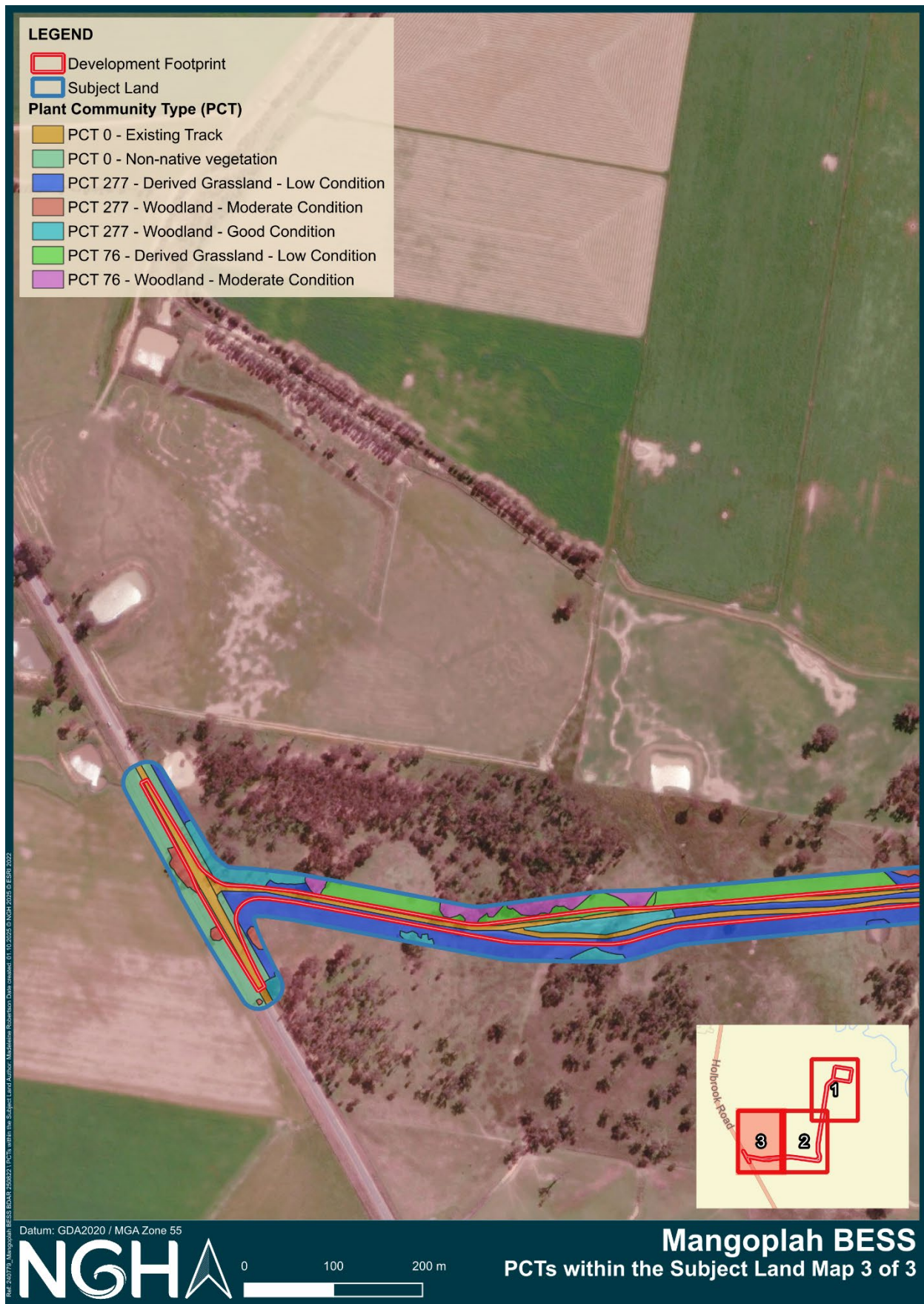


Figure 4-10 PCTs within the Subject Land - Map 3 of 3 (NGH, 2025)

4.3. Vegetation zones

Collection of rapid assessment points, and detailed floristic plots have been used to assist the delineation of vegetation zones. Two PCTs were identified in the Subject Land. Each PCT was stratified into zones representing a similar broad condition state. These zones were based on the overstorey, midstorey and understorey condition, vegetation integrity scores generated by the BAM-C, and observed land management practices, as described in section 4. The following describes how each vegetation zone was delineated within the Subject Land:

- **Low Condition Derived Grassland:** absence of canopy coverage with mixed coverage of exotic and native understorey species.
- **Moderate Condition Woodland:** typically contains native overstorey. Shrub layer is absent and understorey is heavily disturbed and dominated by exotic species. There is minimal understorey regeneration.
- **Good Condition Woodland:** typically contains a native overstorey, shrub layer is absent, understorey is a mix of native and exotic species. There is regeneration of canopy species.

Patch size has been calculated for each vegetation zone. For woodland zones, patch size was determined by including all native woodland vegetation with a gap of less than 100 m from the next area of native vegetation. Patches can extend outside the Subject Land and Assessment Area. Two discontinuous patches of woodland vegetation were present in the Subject Land, one in the South connecting along Holbrook Road and one in the North connecting to Burkes Creek and. The patch size for the two woodland areas were calculated as 53 ha and >213 ha respectively. Only Zone 2 (PCT 277_moderate) connects to the larger patch to Burkes Creek. The larger of these patches were added into the BAM-C for this zone and a patch size class of >100 ha was added to the BAM-C for Zone 2. A patch size class of 25-100 ha has been applied to Zone 1.

For derived grassland zones (Zone 3 and Zone 4), patch size was determined by including all derived native grassland zones connected with a gap of less than 30 m. The patch extends outside the Subject Land and assessment area. The patch size for grassland zones was 29 ha. A patch size class of 25-100 ha has been applied. Vegetation zones are represented in Figure 4-11, Figure 4-12 and Figure 4-13.

Table 4-4 Vegetation zones and patch sizes within the Development Footprint and Subject Land

Vegetation zone ID	PCT ID number and name	Condition	Subject Land (ha)	Development Footprint (ha)	Patch size class	No. vegetation integrity plots (required under the BAM)	No. vegetation integrity plots completed	No. vegetation integrity plots used in assessment	Plot IDs of vegetation integrity plots used in assessment
1	PCT 277	Good	0.60	0.22	☐ <5 ha ☐ 5–24 ha ☒ 25–100 ha ☐ >100 ha	1	1	1	BP3
2	PCT 277	Moderate	1.31	0.13	☐ <5 ha ☐ 5–24 ha ☒ 25–100 ha ☒ >100 ha	1	2	2	BP1, BP7
3	PCT 277	Low	5.18	1.5	☐ <5 ha ☐ 5–24 ha ☒ 25–100 ha ☐ >100 ha	2	2	2	BP6, BP8
4	PCT 76	Low	1.14	0.15	☐ <5 ha ☐ 5–24 ha ☒ 25–100 ha ☐ >100 ha	1	2	1	BP4, BP5
5	PCT 76	Good	0.32	0	☐ <5 ha ☐ 5–24 ha ☒ 25–100 ha ☐ >100 ha	1	0	0	0

4.4. Threatened ecological communities

A summary of the Threatened Ecological Communities (TECs) identified within the Subject Land are listed in Table 4-5 and their extent is shown on Figure 4-11, Figure 4-12 and Figure 4-13. The assessment of the presence of each of the TECs is given in Section 4.4.1.

Table 4-5 TECs within the Subject Land

TEC name	Profile ID (from TBDC)	BC Act status	EPBC Act status	Associated vegetation zones within the Subject Land	Area within Subject Land (ha)	Associated vegetation zones within the Development Footprint	Area within Development Footprint (ha)
<i>Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions</i>	20072	E	Not Listed	Zone 5 PCT 76 Good Zone 4 PCT 76 Low	Zone 5 – 0.32 Zone 4 – 1.14	Zone 4 PCT 76 Low	Zone 4 – 0.15
<i>Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia</i>	20395	Not Listed	E	Zone 5 PCT 76 Good	Zone 5 – 0.32	None	0
<i>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</i>	10837	CE	Not Listed	Zone 1 PCT 277 Good Zone 2 PCT 277 Moderate Zone 3 PCT 277 Low	Zone 1 – 0.60 Zone 2 – 1.31 Zone 3 – 5.18	Zone 1 PCT 277 Good Zone 2 PCT 277 Moderate Zone 3 PCT 277 Low	Zone 1 – 0.22 Zone 2 – 0.13 Zone 3 – 1.50

TEC name	Profile ID (from TBDC)	BC Act status	EPBC Act status	Associated vegetation zones within the Subject Land	Area within Subject Land (ha)	Associated vegetation zones within the Development Footprint	Area within Development Footprint (ha)
<i>Bioregions</i>							
<i>White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland</i>	20392	Not Listed	CE	Zone 1 PCT 277 Good	Zone 1 – 0.60	Zone 1 PCT 277 Good	Zone 1 – 0.22

4.4.1. Threatened Ecological Community equivalency assessment

Vegetation zones for PCTs that are associated with a TEC have been assessed against the relevant BC Act and EPBC Act scientific criteria to determine if they are present on site.

New South Wales BC Act

Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions

PCT 76 is associated with the BC Act-listed Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions (Inland Grey Box Woodland). An assessment of whether the PCTs within the Subject Land meet the criteria for the TEC is given below.

The BC Act describes Inland Grey Box Woodland by the following criteria (OEH, 2025):

- Inland Grey Box (*Eucalyptus microcarpa*) is the most characteristic species.
- Woodlands in which the most characteristic tree species is Inland Grey Box (*Eucalyptus microcarpa*), is often found in association with Bimbil Box (*Eucalyptus populnea* subsp. *bimbil*), White Cypress-pine (*Callitris glaucophylla*), Kurrajong (*Brachychiton populneus*), Buloke (*Allocasuarina luehmannii*) or Yellow Box (*Eucalyptus melliodora*) and sometimes with White Box (*Eucalyptus albens*).
- Shrubs are typically sparse or absent.
- Other associated native plants are present in the understorey and can be low in abundance.
- Inland Grey Box may be found in the local government areas; inclusive of Wagga Wagga.
- Some remnants of the community survive with trees partly or wholly removed.
- Some remnants are highly degraded, with weedy understories and only a few hardy natives remaining. Understorey species composition may differ markedly between these sites due to past and present management practices. In some instances, intentional introduction of non-indigenous species has occurred.

It was concluded that all patches of PCT 76 conform to the BC Act TEC criteria. Grey Box is the dominant canopy species present within the patches of woodland and likely to have been dominant in the derived grassland areas. The TEC can occur in degraded areas with disturbed understories.

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

PCT 277 is associated with the BC Act listed *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* (Box-gum Woodlands). An assessment of whether the PCTs within the Subject Land meet the criteria for the TEC is given in Table 4-6 below. It was concluded that all patches of PCT 277 conform to the BC Act TEC criteria.

Table 4-6 Vegetation assessment against BC Act criteria for White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland TEC listing advice

Key Diagnostic characteristics	Zone 1 (Woodland - Good Condition)	Zone 2 (Woodland - Moderate Condition)	Zone 3 (Derived Grassland - Low Condition)
- Is the site on the tablelands or western slopes of NSW?	Yes. These vegetation zones occur in the NSW South Western Slopes IBRA bioregion.		
- Does the site contain, or would the site have recently been likely to contain White Box, Yellow Box or Blakely's Red Gum?	Yes. This zone contains an intact canopy consisting of Yellow Box (<i>Eucalyptus melliodora</i>) and Blakely's Red Gum (<i>Eucalyptus blakelyi</i>).	Yes. This zone contains Yellow Box (<i>Eucalyptus melliodora</i>).	Yes. This zone is a derived grassland of PCT 277 and is considered to previously have had a canopy consisting of characteristic species of the PCT including Yellow Box (<i>Eucalyptus melliodora</i>) and Blakely's Red Gum (<i>Eucalyptus blakelyi</i>).
- Is the ground layer mainly grassy?	Yes. Shrubs are absent and the ground layer is dominated by grasses and forbs including: - Red Grass (<i>Bothriochloa macra</i>) - Common Couch (<i>Cynodon dactylon</i>) - Windmill Grass (<i>Chloris truncata</i>).	Yes. Shrubs are absent and the ground layer is dominated by grasses and forbs. The understory is predominantly exotic but native grasses and forbs include: - Small Crumbweed (<i>Dysphania pumilio</i>) - Common Couch (<i>Cynodon dactylon</i>) - Windmill Grass (<i>Chloris truncata</i>) - Ringed Wallaby Grass (<i>Rytidosperma caespitosum</i>).	Yes. Shrubs are absent and the ground layer is dominated by grasses and forbs including: - Red Grass (<i>Bothriochloa macra</i>) - Panicum (<i>Panicum sp.</i>) - Common Couch (<i>Cynodon dactylon</i>) - Windmill Grass (<i>Chloris truncata</i>) - Ringed Wallaby Grass (<i>Rytidosperma caespitosum</i>) - Small-flowered Wallaby Grass (<i>Rytidosperma setaceum</i>).

Key Diagnostic characteristics	Zone 1 (Woodland - Good Condition)	Zone 2 (Woodland - Moderate Condition)	Zone 3 (Derived Grassland - Low Condition)
- If the site has been degraded, is there potential for assisted natural regeneration of the tree layer or the understory (e.g. by removing grazing, weeds, etc)?	Yes , by removing grazing and the various weeds from these zones it is considered that the community could recover naturally.	Yes , by removing grazing and the various weeds from these zones it is considered that the community could recover naturally.	Yes , by removing grazing and the various weeds from these zones it is considered that the community could recover naturally.
TEC Present?	Yes, meets above criteria.	Yes, meets above criteria.	Yes, meets above criteria.

Commonwealth EPBC Act

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

PCT 277 is associated with the EPBC Act listed *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland*. An assessment of whether the vegetation zones within the Subject Land meet the criteria for the TEC is given in Table 4-7 below. It was concluded that only Zone 1- Woodland good condition conformed to the EPBC Act TEC criteria based on the presence of a predominantly perennial native groundcover and regeneration of canopy species. Zone 2 and Zone 3 were considered too degraded based on poor understory condition and lack of canopy cover to meet the TEC.

Table 4-7 Vegetation assessment against White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland EPBC Act TEC listing advice criteria

Key Diagnostic characteristics	Zone 1 (Woodland - Good Condition)	Zone 2 (Woodland - Moderate Condition)	Zone 3 (Derived Grassland - Low Condition)
Does the patch occur along the western slopes and tablelands of the Great Dividing Range from Southern Queensland through NSW to central Victoria including the Brigalow Belt South, Nandewar, New England Tableland, South Eastern Queensland, Sydney Basin, NSW North Coast, South Eastern Highlands, South East Corner, NSW South Western Slopes, Victorian Midlands and Riverina Bioregions.	Yes. The patch occurs in the NSW South Western Slopes IBRA bioregion.		
Is the patch dominated, co-dominated or used to be dominated by White Box, Yellow Box or Blakely's Red Gum?	Yes. This zone contains an intact canopy dominated by Yellow Box (<i>Eucalyptus melliodora</i>) and Blakely's Red Gum (<i>Eucalyptus blakelyi</i>).	Yes. This zone contains a canopy dominated by Yellow Box (<i>Eucalyptus melliodora</i>) and Blakely's Red Gum (<i>Eucalyptus blakelyi</i>).	Yes. This zone is a derived grassland of PCT 277 and is considered to previously have had a dominant canopy consisting of characteristic species of the PCT including Yellow Box

Key Diagnostic characteristics	Zone 1 (Woodland - Good Condition)	Zone 2 (Woodland - Moderate Condition)	Zone 3 (Derived Grassland - Low Condition)
			(<i>Eucalyptus melliodora</i>) and Blakely's Red Gum (<i>Eucalyptus blakelyi</i>).
Does the patch have a predominately native understory (i.e. more than 50% of the perennial vegetative ground layer must comprise native species)?	Yes. This zone was dominated by the native grass <i>Red Grass</i> (<i>Bothriochloa macra</i>), covering 30% of the 20m x 20m floristic plot. The total perennial ground layer was comprised of more than 50% native species.	No. The ground layer of this vegetation zone contained an average of 25.6% native species, and an exotic-dominated understory including perennial grasses such as <i>Paspalum</i> and <i>Phalaris</i> species. Not the Listed Ecological Community	Yes. The average native perennial understory cover was approximately 51.95%.
For patches of high quality including those without an existing canopy: - Is the patch >0.1 ha in size? AND - Does the patch contain at least 12 native, non-grass understory species? AND - Does the patch contain at least one listed important understory species (i.e. grazing-sensitive, regionally significant	The patch is >0.1 ha in size. No. Understory diversity is low and the patch does not meet the criteria of containing at least 12 native, non-grass understory species, and containing at least one listed important understory species.	N/A as above criteria not met.	- The patch is >0.1 ha in size. No. Understory diversity is low and this vegetation zone only identified eight native non-grass understory species (forbs) across 3 VI plots. The patch contains at least one listed important understory species (Hairy Joyweed (<i>Alternanthera nana</i>)).

Key Diagnostic characteristics	Zone 1 (Woodland - Good Condition)	Zone 2 (Woodland - Moderate Condition)	Zone 3 (Derived Grassland - Low Condition)
or uncommon species)?			
For patches of lower quality that have retained an overstorey. - Is the patch size >2 ha in size? AND - Does the patch have either natural regeneration of the overstorey species? AND/OR 20 or more mature trees/hectare?	Yes. The patch is >2 ha in size. Yes. The patch has natural regeneration of the overstorey species.	N/A as above criteria not met.	No. The patch is >2 ha in size, however it does not have natural regeneration of the overstorey species or have 20 or more mature trees per hectare.
TEC Present?	Yes, meets above criteria.	No – the patch does not have a predominantly native understorey.	No, does not meet above criteria.

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

PCT 76 is associated with the EPBC Act listed *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia*. An assessment of whether the vegetation zones within the Subject Land meet the criteria for the TEC is given in Table 4-6 below. Zone 4 did not meet the condition threshold for the TEC as the zone was considered too degraded with too few native species. Zone 5 meets the condition threshold based on the canopy cover and more intact native understory. This zone is avoided by the Development Footprint.

Table 4-8 Vegetation assessment against Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia EPBC Act TEC listing advice criteria

Key Diagnostic characteristics	Zone 4 (Derived Grassland – Low Condition)	Zone 5 (Woodland – Moderate Condition)
Is, or was previously the most common tree species Grey Box (<i>Eucalyptus microcarpa</i>)?	Yes. The most common tree species in the surrounding vegetation is Grey Box, so it is likely that this was in the patch prior to clearing.	Yes. The most common tree species is Grey Box.
Is the patch at least 0.5 ha in size?	Yes. This patch is >0.5 ha in size.	Yes. This patch is >0.5 ha in size.
Do non-grass weeds make up more than 30% of the plant cover in the ground layer?	No. Ground cover is predominantly native. Exotic non-grass weeds make up 0.6% cover in the ground layer of this vegetation zone.	No. Ground cover is predominantly native and non-grass weeds do not make up more than 30% of the plant cover in the ground layer.
Do trees cover at least 10% of the patch?	No. This zone is derived grassland therefore tree cover is less than 10% of the patch.	Yes. Tree cover is at least 10% of the patch in this vegetation zone.
Is there evidence that Grey Box trees were once common in the patch	Likely. It is likely that Grey Box trees were common based on the presence of Grey Box in the surrounding landscape.	N/A
Are there at least 12 perennial native species in the mid and ground layers?	No. 10 perennial native species detected in the mid and ground layer.	N/A

Key Diagnostic characteristics	Zone 4 (Derived Grassland – Low Condition)	Zone 5 (Woodland – Moderate Condition)
	Not the Listed National Threatened Ecological Community	
Is the patch bigger than 2 ha?	N/A as above criteria not met.	Yes. The patch is > 2 ha.
Are there at least 8 trees/ha. a) That contain hollows; or b) Have a diameter >60 cm at 1.3 m above ground level?	N/A as above criteria not met.	Yes. There are at least 8 trees/ha that contain hollows or have a diameter > 60 cm at 1.3 m above ground level.
Is at least 10% of the plant cover in the ground layer made up of perennial native grass species?	N/A as above criteria not met.	Yes. At least 10% of the plant cover in the ground layer is made up of perennial native grass species. This vegetation zone meets the criteria for the threatened ecological community.
TEC Present?	No – does not meet TEC criteria.	Yes, meets above TEC criteria.

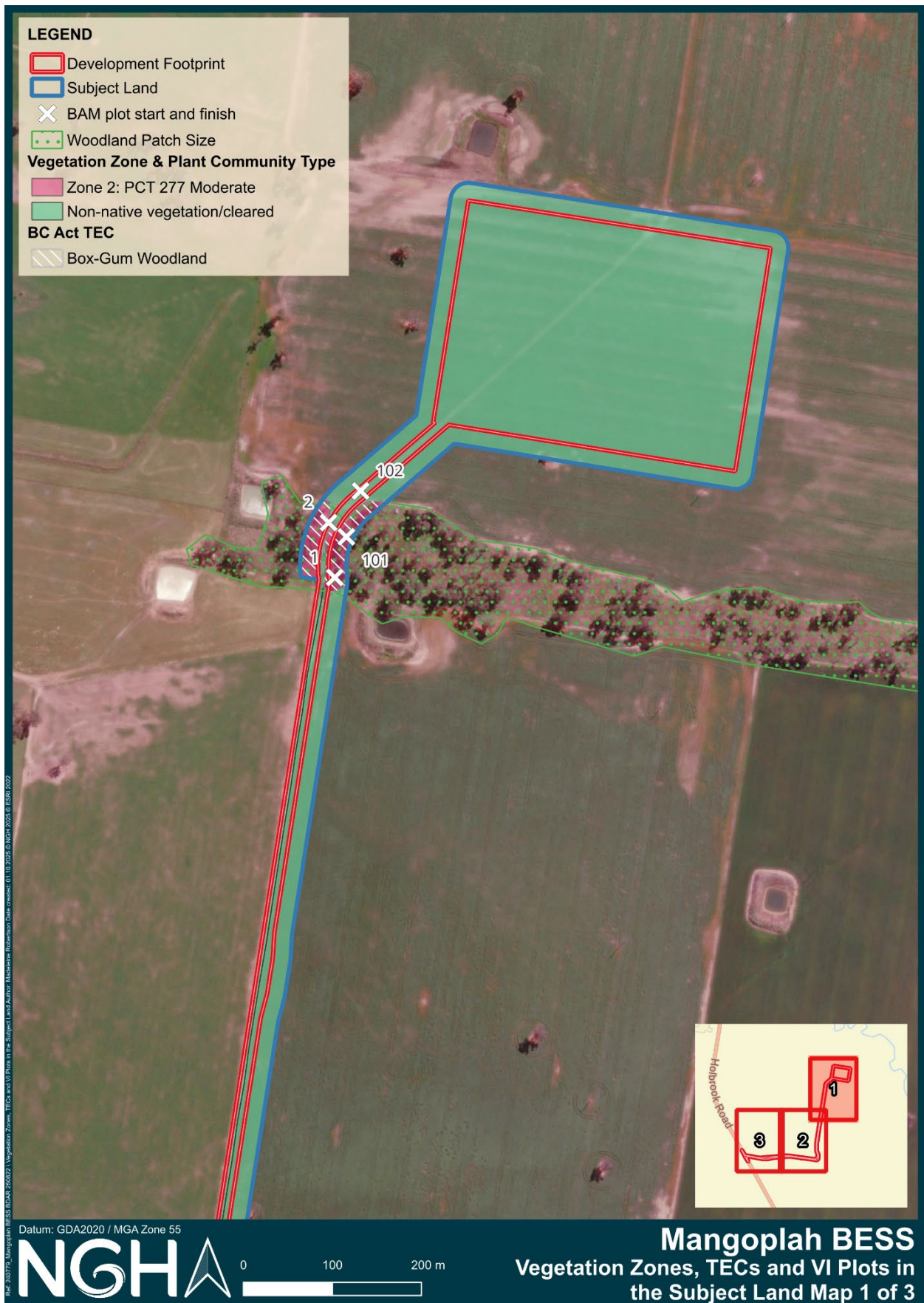


Figure 4-11 Vegetation Zones, TECs and VI Plots in the Subject Land – Map 1 of 3 (NGH, 2025)

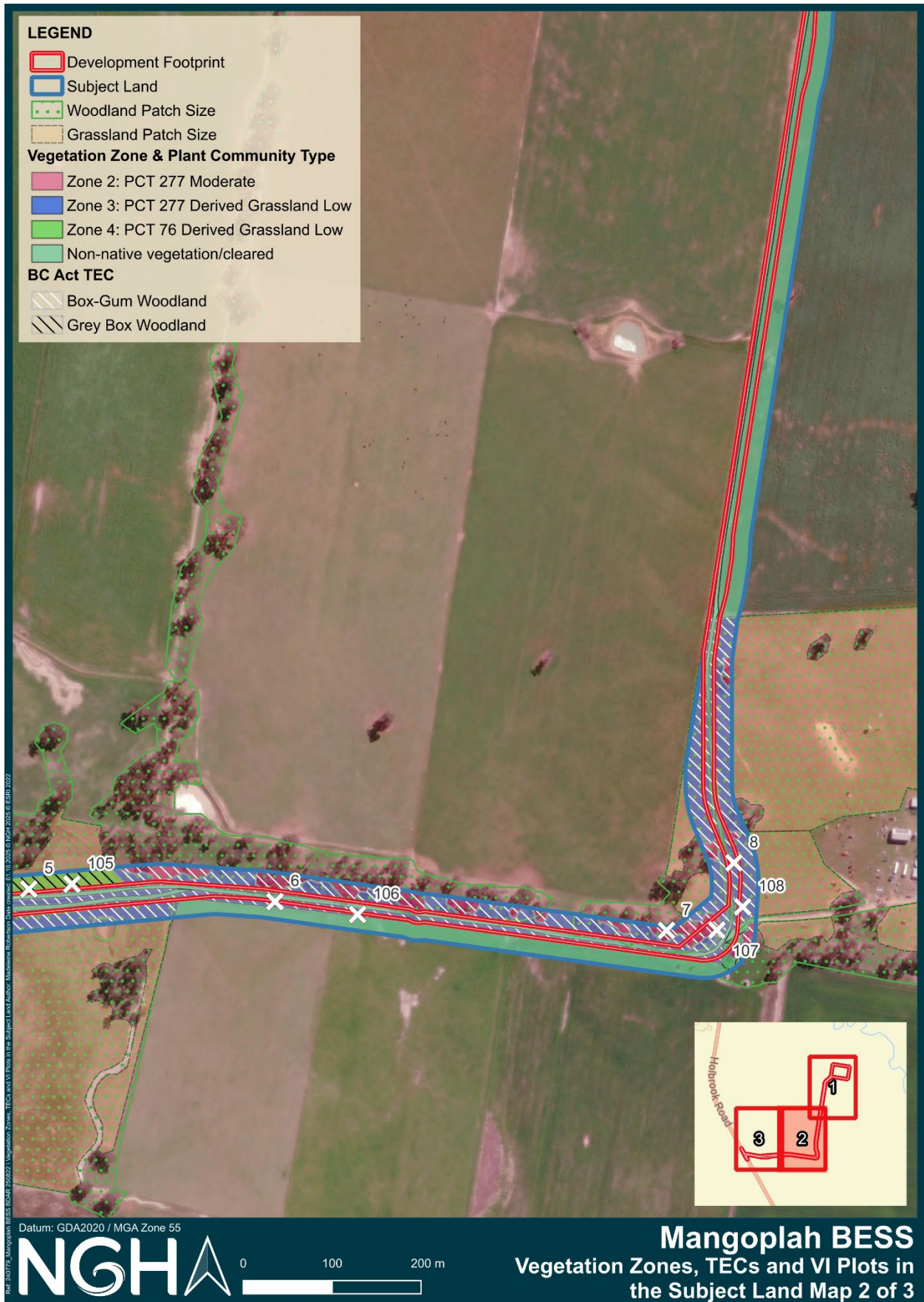


Figure 4-12 Vegetation Zones, TECs and VI Plots in the Subject Land – Map 2 of 3 (NGH, 2025)

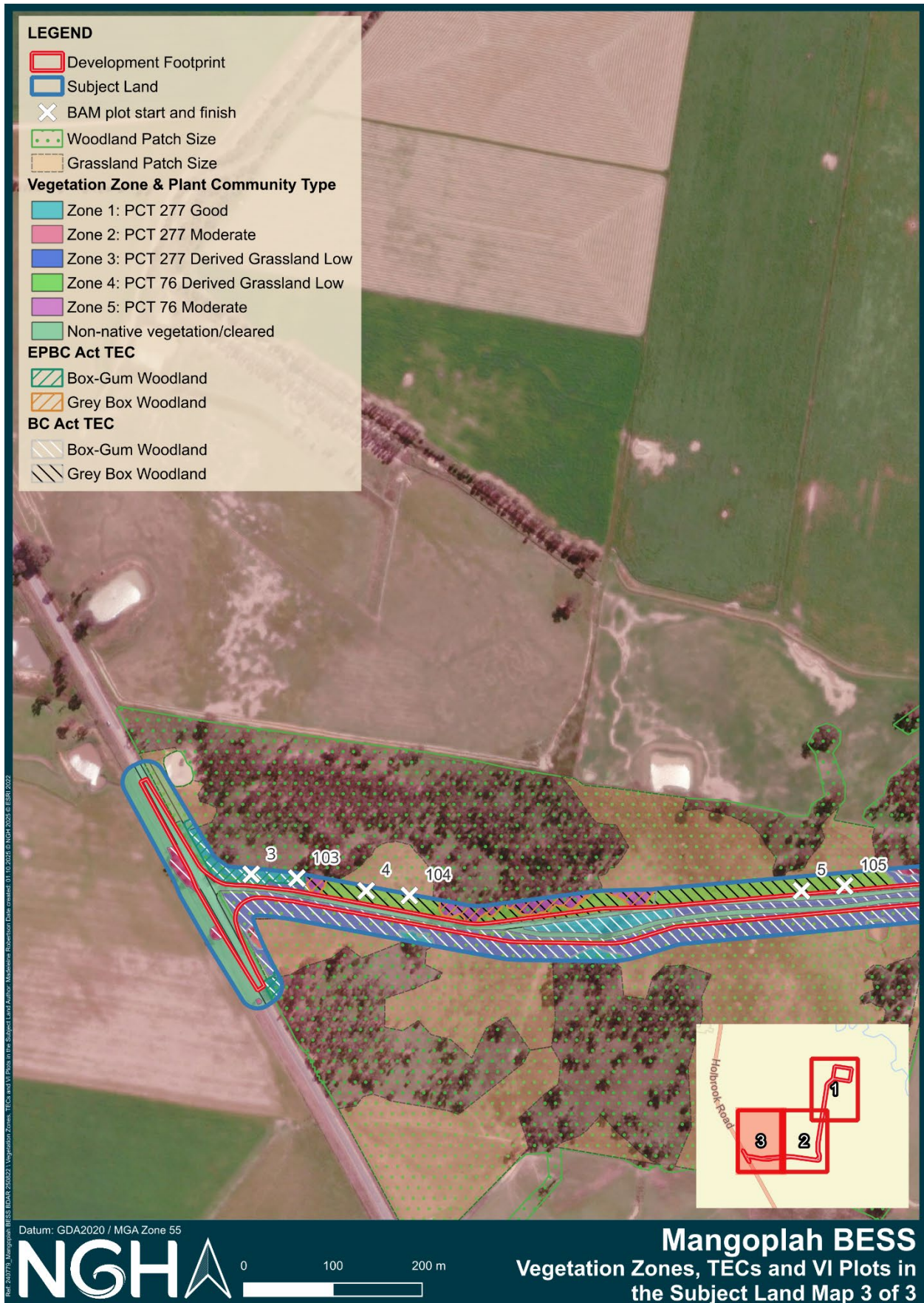


Figure 4-13 Vegetation Zones, TECs and VI Plots in the Subject Land – Map 3 of 3 (NGH, 2025)

4.5. Hollow-bearing trees

Across the Subject Land, 25 HBTs were recorded, in addition to four large trees with no visible hollows. Four of the 25 HBTs are located less than two metres outside the western section of the Subject Land, with the majority of the canopy hanging over the Subject Land. Four trees with a Diameter at Breast Height (DBH) of < 60 cm (Tree ID 7, 12 and 13 and 29) did not contain any hollows therefore have been excluded from Table 4-9 below, but are displayed in Figure 4-14. Hollows in Table 4-9 are described as follows: hollow location (e.g. trunk, limb), entrance diameter and height above ground of hollow location.

Table 4-9 Hollow-bearing trees recorded in the Subject Land

HBT ID	Species	DBH (cm)	Vegetation Zone	Connectivity	Hollow description	Habitat suitability
1	Grey Box (<i>Eucalyptus microcarpa</i>)	80	Zone 2	Nearest woodland trees <10 m proximity	Limb 6-10 cm, 12 m Fissure 6-10 cm, 10 m Fissure 6-10 cm, 10 m	Parrots, possums, bats, birds, arboreal mammals, gliders.
2	Yellow Box (<i>Eucalyptus melliodora</i>)	70	Exotic	Nearest scattered tree 68 m proximity	Trunk 11-20 cm, 10 m	Cockatoos, parrots, possums, owls, bats, birds, arboreal mammals Gliders unlikely to utilise due to distance from other strips & low canopy height ¹ .
3	Blakely's Red Gum (<i>Eucalyptus blakelyi</i>)	92	Zone 2	Nearest woodland trees <10 m proximity	Limb 6-10 cm, 10 m	Parrots, possums, bats, birds, arboreal mammals Gliders unlikely to utilise due to distance from other strips.
4	Blakely's Red Gum (<i>Eucalyptus blakelyi</i>)	90	Exotic	Nearest scattered tree 68 m proximity	Limb 6-10 cm, 10 m Limb 6-10 cm, 10 m Limb <5 cm, 12	Cockatoos, parrots, possums, owls, bats, birds, arboreal mammals Gliders unlikely to utilise due to

¹ Glide distance is a function of distance between and height of trees

HBT ID	Species	DBH (cm)	Vegetation Zone	Connectivity	Hollow description	Habitat suitability
					m	distance from other strips.
5	Yellow Box (<i>Eucalyptus melliodora</i>)	136	Zone 2	Nearest scattered tree 120 m proximity, nearest woodland tree 150 m proximity	Limb 20-40 cm, 10 m Trunk 20-40 cm, 11 m	Cockatoos, parrots, possums, owls, bats, birds, arboreal mammals Gliders unlikely to utilise due to distance from other strips.
6	Yellow Box (<i>Eucalyptus melliodora</i>)	56	Zone 2	Nearest woodland trees ~5 m proximity	Trunk <5cm, 2 m Trunk 6-10 cm, 5 m	Parrots, possums, bats, birds, arboreal mammals, gliders.
8	Yellow Box (<i>Eucalyptus melliodora</i>)	64	Zone 2	Nearest woodland trees ~5 m proximity	Trunk 20-40 cm, 10 m Trunk 11-20 cm, 12 m Trunk 11-20 cm, 12 m	Cockatoos, parrots, possums, owls, bats, birds, arboreal mammals, gliders.
9	Yellow Box (<i>Eucalyptus melliodora</i>)	45	Zone 2	Nearest woodland trees ~5 m proximity	Limb 6-10 cm, 6 m	Parrots, possums, bats, birds, arboreal mammals, gliders.
10	Yellow Box (<i>Eucalyptus melliodora</i>)	90	Zone 2	Nearest woodland trees ~5 m proximity	Limb 6-10 cm, 5 m Limb 11-20 cm, 10 m Limb 6-10 cm, 3 m	Cockatoos, parrots, possums, owls, bats, birds, arboreal mammals, gliders.
11	Yellow Box (<i>Eucalyptus melliodora</i>)	90	Zone 2	Nearest woodland trees 10-20 m proximity	Limb <5 cm, 7 m	Parrots, possums, bats, birds, arboreal mammals, gliders.
14	Blakely's Red Gum (<i>Eucalyptus</i>)	82	Zone 2	Nearest woodland trees ~5 m proximity	Trunk <5 cm, 8 m Limb 6-10 cm, 7 m	Parrots, possums, bats, birds, arboreal

HBT ID	Species	DBH (cm)	Vegetation Zone	Connectivity	Hollow description	Habitat suitability
	<i>blakelyi</i>)				m Limb 6-10 cm, 8 m	mammals, gliders.
15	Grey Box (<i>Eucalyptus microcarpa</i>)	80	Zone 4	Nearest scattered tree 40 m proximity, nearest woodland tree <90 m proximity	Limb 6-10 cm, 5 m	Parrots, possums, bats, birds, arboreal mammals Gliders unlikely to utilise due to distance from other strips.
16	Grey Box (<i>Eucalyptus microcarpa</i>)	68	Zone 5	Nearest woodland trees 35-45 m proximity	Limb <5 cm, 7 m Limb 6-10 cm, 5 m	Parrots, possums, bats, birds, arboreal mammals, gliders.
17	Blakely's Red Gum (<i>Eucalyptus blakelyi</i>)	151	Zone 1	Nearest woodland trees 10-20 m proximity	Trunk 11-20 cm, 8 m Trunk 20-40 cm, 10 m	Cockatoos, parrots, possums, owls, bats, birds, arboreal mammals, gliders.
18	Grey Box (<i>Eucalyptus microcarpa</i>)	93	Zone 5	Nearest woodland trees 10-15 m proximity	Trunk 11-20 cm, 0 m Limb 11-20 cm, 10 m	Cockatoos, parrots, possums, owls, bats, birds, arboreal mammals, gliders.
19	Blakely's Red Gum (<i>Eucalyptus blakelyi</i>)	93	Zone 1	Nearest woodland trees 13-40 m proximity	Trunk 6-10 cm, 3 m Limb <5 cm, 8 m	Parrots, possums, bats, birds, arboreal mammals, gliders.
20	Grey Box (<i>Eucalyptus microcarpa</i>)	48	Zone 1	Nearest woodland trees 13-35 m proximity	Trunk 6-10 cm, 8 m	Parrots, possums, bats, birds, arboreal mammals, gliders.
21	Grey Box (<i>Eucalyptus microcarpa</i>)	85	Zone 5	Nearest woodland trees 15-20 m proximity	Trunk 20-40 cm, 5 m Limb 6-10 cm, 8 m	Cockatoos, parrots, possums, owls, bats, birds, arboreal mammals, gliders.

HBT ID	Species	DBH (cm)	Vegetation Zone	Connectivity	Hollow description	Habitat suitability
22	Blakely's Red Gum (<i>Eucalyptus blakelyi</i>)	72	Zone 1	Nearest woodland trees 20-30 m proximity	Limb <5 cm, 2 m	Parrots, possums, bats, birds, arboreal mammals, gliders.
23	Yellow Box (<i>Eucalyptus melliodora</i>)	124	Zone 2	Nearest scattered tree <5 m proximity, nearest woodland trees 55-60 m proximity	Trunk 20-40 cm, 8 m Limb 6-10 cm, 19 m	Cockatoos, parrots, possums, owls, bats, birds, arboreal mammals Gliders unlikely to utilise due to distance from other strips.
24	Yellow Box (<i>Eucalyptus melliodora</i>)	70	Zone 2	Nearest scattered tree <5 m proximity, nearest woodland trees 55-60 m proximity	Trunk 11-20 cm, 7 m Trunk 6-10 cm, 9 m	Cockatoos, parrots, possums, owls, bats, birds, arboreal mammals Gliders unlikely to utilise due to distance from other strips and low canopy height.
25	<i>Eucalyptus sp.</i>	82	Zone 2	Nearest woodland trees ~10 m proximity	Trunk 6-10 cm, 1 m Trunk >40 cm, 3 m Limb 6-10 cm, 3 m	Cockatoos, parrots, possums, owls, bats, birds, arboreal mammals, gliders.
26	Blakely's Red Gum (<i>Eucalyptus blakelyi</i>)	76	Zone 2	Nearest woodland trees ~10 m proximity	Limb 6-10 cm, 4 m Trunk 11-20 cm, 10 m Limb 6-10 cm, 6 m Trunk 11-20 cm, 6 m Limb <5 cm, 6 m	Cockatoos, parrots, possums, owls, bats, birds, arboreal mammals, gliders.

HBT ID	Species	DBH (cm)	Vegetation Zone	Connectivity	Hollow description	Habitat suitability
27	Blakely's Red Gum (<i>Eucalyptus blakelyi</i>)	60	Zone 2	Nearest woodland trees ~15 m proximity	Trunk 6-10 cm, 6 m	Parrots, possums, bats, birds, arboreal mammals, gliders.
28	<i>Eucalyptus</i> sp.	60	Zone 2	Nearest scattered tree 20-25 m proximity, nearest woodland trees ~50 m proximity	Trunk 11-20 cm, 8 m	Cockatoos, parrots, possums, owls, bats, birds, arboreal mammals, gliders.

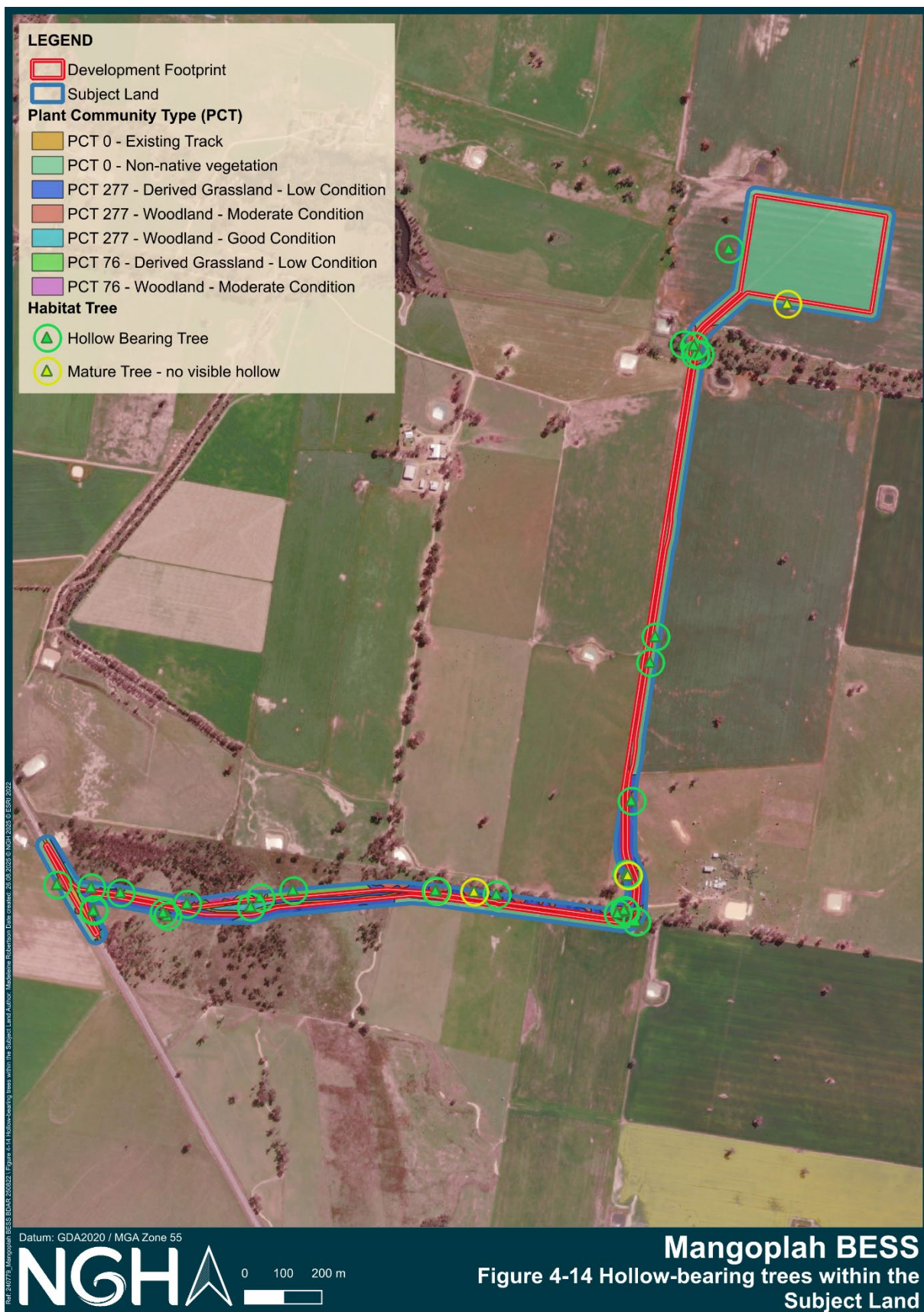


Figure 4-14 Hollow-bearing trees within the Subject Land (NGH, 2025)

4.6. Scattered trees

All scattered trees in the Subject Land were mapped during field surveys using a handheld GIS enabled Samsung tablet. Trees were identified to species level. The Diameter at Breast Height (DBH) of the tree was measured or estimated. Each tree was visually assessed from the ground to determine whether any hollows were present.

Scattered trees are defined as species listed in the tree growth form group that:

- have a percent foliage cover that is less than 25% of the benchmark for tree cover for the most likely plant community type and are on category 2-regulated land and surrounded by category 1-exempt land on the Native Vegetation Regulatory Map under the LLS Act, or
- have a Diameter at Breast Height (DBH) of greater than or equal to 5 cm and are located more than 50 m away from any living tree that is greater than or equal to 5 cm DBH, and the land between the scattered trees is comprised of vegetation that are all ground cover species on the widely cultivated native species list, or exotic species or human-made surfaces or bare ground, or
- are three or fewer trees that have a DBH of greater than or equal to 5 cm and are within a distance of 50 m of each other, that in turn, are greater than 50 m away from the nearest living tree that is greater than or equal to 5 cm DBH, and the land between the scattered trees is comprised of vegetation that are all ground cover species on the widely cultivated native species list, or exotic species or human-made surfaces or bare ground.

Three scattered trees occur within the Subject Land and were identified during field surveys and through aerial imagery (Figure 4-15). These meet the scattered tree definition as they have a DBH of greater than or equal to 5 cm and are located one more than 50 m away from any living tree that is greater than or equal to 5 cm DBH, where they occur on cropped land (exotic species). One tree did not contain any hollows (Tree ID 29). Table 4-10 below summarises the scattered trees occurring within the Subject Land. None of these scattered trees occur within the Development Footprint.

Table 4-10 Scattered trees within the Subject Land

ID	Species	PCT	DBH (cm)	Easting	Northing	Hollows present?
2	Yellow Box (<i>Eucalyptus melliodora</i>)	277	70	525464.23	6082809.15	Yes
4	Blakey's Red Gum (<i>Eucalyptus blakelyi</i>)	277	90	525450.65	6082742.09	Yes
29	Kurrajong (<i>Brachychiton populneus</i>)	277	71	525805.96	6083671.44	No

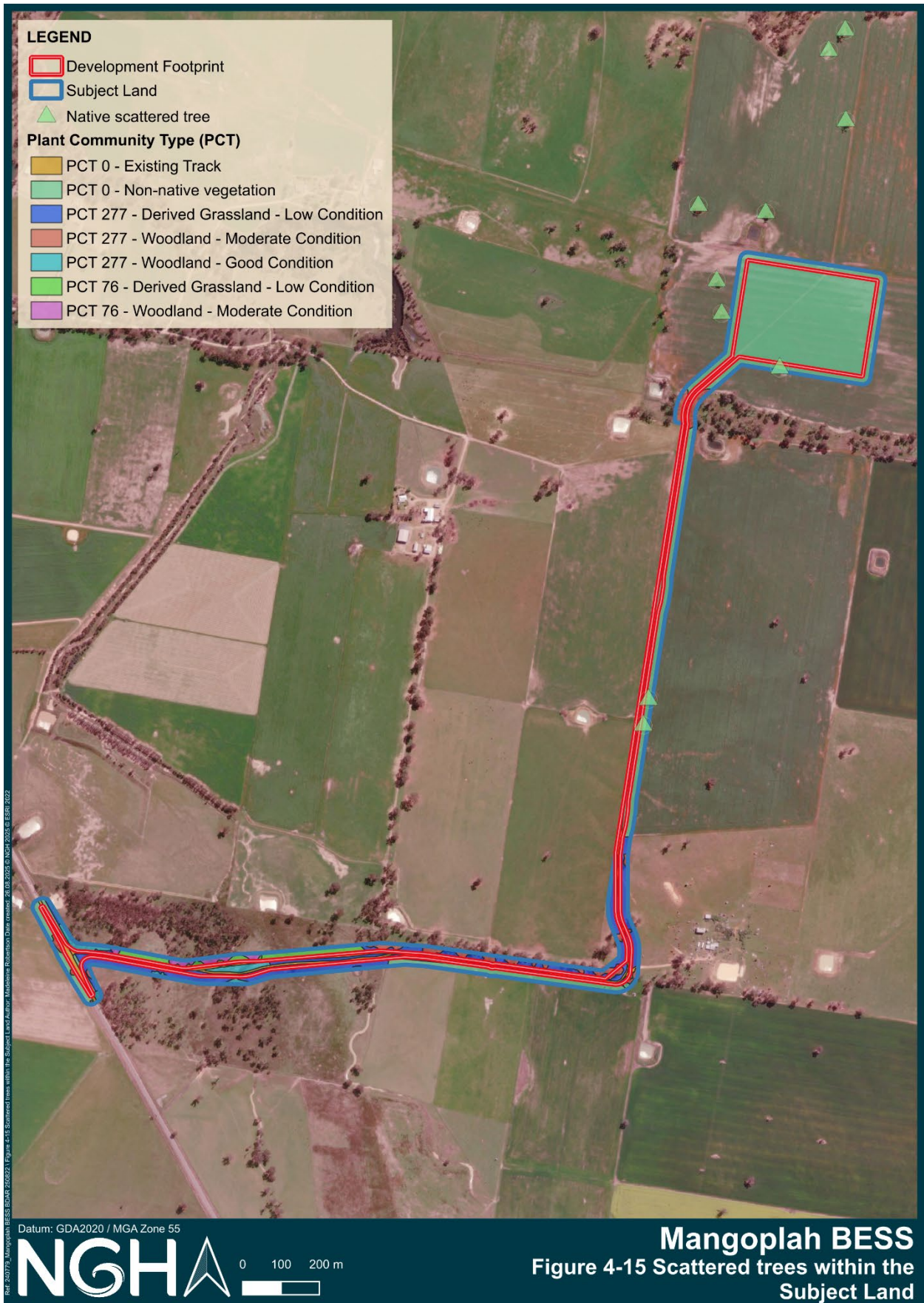


Figure 4-15 Scattered trees within the Subject Land (NGH, 2025)

4.7. Vegetation integrity (vegetation condition)

4.7.1. Vegetation integrity survey plots

A total of eight VI plots were undertaken following section 4.3.3 of the Biodiversity Assessment Method (DPE, 2020). At least one plot was completed for each vegetation zone, excluding Zone 5, where no VI plots were undertaken. This zone falls outside the Development Footprint. Locations of each VI plot are mapped in Figure 4-11, Figure 4-12 and Figure 4-13. The results of the plot field data along with photos of each plot can be found in Appendix D.

4.7.2. Scores

The plot data from each of the vegetation integrity survey plots were entered into the BAM-C. The vegetation integrity score (VI score) for each of the vegetation zones are shown in Table 4-11.

Table 4-11 Current vegetation integrity scores for each vegetation zone within the Development Footprint

Vegetation zone ID	PCT/Zone	Composition condition score	Structure condition score	Function condition score	Vegetation Integrity Score	HBTs present?
1	277 Good	49.5	86	38.2	54.6	Yes
2	277 Moderate	23.9	43.1	57.6	39	Yes
3	277 Low	54.1	55.3	14.6	35.2	No
4	76 Low	47.6	37.9	12.6	28.3	No

4.7.3. Use of benchmark data

The vegetation integrity scores above were calculated against the default benchmark data provided in the BAM-C.

5. Habitat suitability for threatened species

Habitat in the Subject Land consists of derived grasslands and woodlands. Many threatened species may use this habitat for foraging, breeding, nesting or resting. Woodland in moderate condition has a predominantly exotic understory, while woodland in good condition has a predominantly native understory with regenerative trees. Derived grasslands are generally in low condition across the Subject Land as a result of past clearing for cropping and agricultural-related activities. The Subject Land is still currently utilised for agriculture, therefore subjected to agricultural related activities that have reduced vegetation quality. Grasslands across the Subject Land have the potential to support threatened species including birds, reptiles, amphibians and insects, but it is less likely that these species would occupy the area due to the degraded habitat. This is similar to threatened flora species, as the potential habitat has been subjected to grazing, trampling, herbicide and significant land use modification over time. Habitat for arboreal species and generalists including birds, bats and mammals is in better condition in the woodland zones, therefore increasing the likelihood of threatened species using this habitat.

5.1. Identification of threatened species for assessment

5.1.1. Background searches

A BioNet search identified one threatened flora species, Yass Daisy (*Ammobium craspedioides*) with records within 10 km of the Development Footprint (OEH, 2021). This species occurs in Livingstone National Park around 3.5 km East of the Subject Land. A PMST search identified nine threatened flora species with the potential to occur, within 10 km of the Development Footprint (DCCEEW, 2025) (Appendix C.1).

Eighteen threatened fauna species were identified from the BioNet Search, occurring within 10 km of the Development Footprint (OEH, 2021). The majority of these records occur in Livingstone National Park. The closest fauna records are of Squirrel Glider (*Petaurus norfolcensis*) and Flame Robin (*Petroica phoenicea*) occurring near the Mangoplah Village.

Species identified in the background searches had been included in the BAM-C and no additional species were required to be added into the BAM-C.

5.1.2. Ecosystem credit species

Table 5-1 lists ecosystem credit species returned by the BAM-C as being associated with the PCTs present inside the Development Footprint. These species are assumed to occur with suitable habitat onsite and contribute to ecosystem credits.

One species, South-eastern Glossy Black Cockatoo (*Calyptorhynchus lathami lathami*) was excluded as an ecosystem species due to the absence of *Allocasuarina* and *Casuarina* spp. present in the Subject Land.

Additionally, one ecosystem credit species, Corben's Long-eared Bat (*Nyctophilus corbeni*) is not known to be associated with the two PCTs in the Subject Land but were recorded on site from an ANABAT acoustic recorder. Corben's Long-eared Bat has been added to the BAM-C as an ecosystem species.

Table 5-1 Ecosystem credit species predicted by the BAM-C

Common Name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Associated PCT & veg zones	Vegetation zone ID species retained within, including PCT ID	Sensitivity to potential gain
		BC Act	EPBC Act							
Black Falcon	<i>Falco subniger</i>	Vulnerable	Not Listed	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	277 Good 277 Moderate 277 Low 76 Low	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76	Moderate
Black-chinned Honeyeater (eastern subspecies)	<i>Melithreptus gularis gularis</i>	Vulnerable	Not Listed	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	277 Good 277 Moderate 277 Low 76 Low	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76	Moderate
Brown Treecreeper (eastern)	<i>Climacteris picumnus victoriae</i>	Vulnerable	Vulnerable	No	☒ BAM-C ☐ TBDC ☐	Yes	N/A	277 Good 277 Moderate	VZ1 PCT 277 VZ2 PCT	High

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Common Name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Associated PCT & veg zones	Vegetation zone ID species retained within, including PCT ID	Sensitivity to potential gain
		BC Act	EPBC Act							
subspecies)					Previous survey ☐ Current survey			277 Low 76 Low	277 VZ3 PCT 277 VZ4 PCT 76	
Corben's Long-eared Bat	<i>Nyctophilus corbeni</i>	Vulnerable	Not Listed	No	☐ BAM-C ☐ TBDC ☐ Previous survey ☒ Current survey	Yes	N/A	No associated PCTs but found at all Anabat-deployed locations in PCT 277 and PCT 76	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76	High
Diamond Firetail	<i>Stagonopleura guttata</i>	Vulnerable	Vulnerable	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	277 Good 277 Moderate 277 Low 76 Low	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76	Moderate

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Common Name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Associated PCT & veg zones	Vegetation zone ID species retained within, including PCT ID	Sensitivity to potential gain
		BC Act	EPBC Act							
Dusky Woodswallow	<i>Artamus cyanopterus cyanopterus</i>	Vulnerable	Not listed	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	277 Good 277 Moderate 277 Low 76 Low	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76	Moderate
Flame Robin	<i>Petroica phoenicea</i>	Vulnerable	Not Listed	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	277 Good 277 Moderate 277 Low 76 Low	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76	Moderate
Gang-gang Cockatoo (Foraging)	<i>Callocephalon fimbriatum</i>	Endangered	Endangered	Yes	☒ BAM-C ☐ TBDC ☐ Previous	Yes	N/A	277 Good 277 Moderate 277 Low	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT	Moderate

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Common Name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Associated PCT & veg zones	Vegetation zone ID species retained within, including PCT ID	Sensitivity to potential gain
		BC Act	EPBC Act							
					survey ☐ Current survey				277	
Grey-crowned Babbler (eastern subspecies)	<i>Pomatostomus temporalis temporalis</i>	Vulnerable	Not Listed	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	277 Good 277 Moderate 277 Low 76 Low	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76	Moderate
Grey-headed Flying-fox (Foraging)	<i>Pteropus poliocephalus</i>	Vulnerable	Vulnerable	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	277 Good 277 Moderate 277 Low 76 Low	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76	High

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Common Name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Associated PCT & veg zones	Vegetation zone ID species retained within, including PCT ID	Sensitivity to potential gain
		BC Act	EPBC Act							
Large Bent-winged Bat (Foraging)	<i>Miniopterus orianae oceanensis</i>	Vulnerable	Not Listed	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☒ Current survey	Yes	N/A	277 Good 277 Moderate 277 Low	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277	High
Little Eagle (Foraging)	<i>Hieraaetus morphnoides</i>	Vulnerable	Not Listed	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	277 Good 277 Moderate 277 Low 76 Low	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76	Moderate
Little Lorikeet	<i>Glossopsitta pusilla</i>	Vulnerable	Not Listed	No	☒ BAM-C ☐ TBDC ☐ Previous	Yes	N/A	277 Good 277 Moderate 277 Low	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT	High

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Common Name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Associated PCT & veg zones	Vegetation zone ID species retained within, including PCT ID	Sensitivity to potential gain
		BC Act	EPBC Act							
					survey ☐ Current survey				277	
Little Pied Bat	<i>Chalinolobus picatus</i>	Vulnerable	Not Listed	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	76_Low	VZ4 PCT76	High
Painted Honeyeater	<i>Grantiella picta</i>	Vulnerable	Vulnerable	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No	Excluded due to lack of habitat (absence of mistletoes).	277 Good 277 Moderate 277 Low 76 Low	N/A – species excluded from further assessment	Moderate

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Common Name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Associated PCT & veg zones	Vegetation zone ID species retained within, including PCT ID	Sensitivity to potential gain
		BC Act	EPBC Act							
Pink Cockatoo (foraging)	<i>Lophochroa leadbeateri</i>	Vulnerable	Endangered	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	76 Low	VZ4 PCT 76	Moderate
Regent Honeyeater (foraging)	<i>Anthochaera Phrygia</i>	Critically endangered	Critically endangered	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	277 Good 277 Moderate	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277	High
Scarlet Robin	<i>Petroica boodang</i>	Vulnerable	Not Listed	No	☒ BAM-C ☐ TBDC ☐ Previous	Yes	N/A	277 Good 277 Moderate 277 Low	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT	Moderate

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Common Name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Associated PCT & veg zones	Vegetation zone ID species retained within, including PCT ID	Sensitivity to potential gain
		BC Act	EPBC Act							
					survey ☐ Current survey			76 Low	277 VZ4 PCT 76	
South-eastern Glossy Black Cockatoo	<i>Calyptorhynchus lathami lathami</i>	Vulnerable	Vulnerable	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No	Excluded due to lack of habitat constraints (<i>Allocasuarina</i> and <i>Casuarina</i> species).	277 Good 277 Moderate 277 Low 76 Low	N/A – species excluded from further assessment	High
South-eastern Hooded Robin	<i>Melanodryas cucullata cucullata</i>	Endangered	Endangered	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	277 Good 277 Moderate 277 Low 76 Low	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76	Moderate

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Common Name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Associated PCT & veg zones	Vegetation zone ID species retained within, including PCT ID	Sensitivity to potential gain
		BC Act	EPBC Act							
Southern Whiteface	<i>Anthochaera phrygia</i>	Vulnerable	Vulnerable	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	277 Good 277 Moderate 277 Low 76 Low	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76	Low
Speckled Warbler	<i>Chthonicola sagittata</i>	Vulnerable	Not Listed	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	277 Good 277 Moderate 277 Low 76 Low	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76	High
Spotted Harrier	<i>Circus assimilis</i>	Vulnerable	Not Listed	No	☒ BAM-C ☐ TBDC ☐ Previous	Yes	N/A	277 Good 277 Moderate 277 Low	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT	Moderate

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Common Name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Associated PCT & veg zones	Vegetation zone ID species retained within, including PCT ID	Sensitivity to potential gain
		BC Act	EPBC Act							
					survey ☐ Current survey				277	
Spotted-tailed Quoll	<i>Dasyurus maculatus</i>	Vulnerable	Endangered	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	277 Good 277 Moderate 277 Low	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277	High
Square-tailed Kite (Foraging)	<i>Lophoictinia isura</i>	Vulnerable	Not Listed	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	277 Good 277 Moderate 277 Low 76 Low	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277	Moderate

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Common Name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Associated PCT & veg zones	Vegetation zone ID species retained within, including PCT ID	Sensitivity to potential gain
		BC Act	EPBC Act							
Superb Parrot (Foraging)	<i>Polytelis swainsonii</i>	Vulnerable	Vulnerable	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	277 Good 277 Moderate 277 Low 76 Low	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277	Moderate
Swift Parrot (Foraging)	<i>Lathamus discolor</i>	Endangered	Critically Endangered	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	277 Good 277 Moderate 277 Low 76 Low	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76	Moderate
Turquoise Parrot	<i>Neophema pulchella</i>	Vulnerable	Not Listed	No	☒ BAM-C ☐ TBDC ☐ Previous	Yes	N/A	277 Good 277 Moderate 277 Low	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT	High

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Common Name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Associated PCT & veg zones	Vegetation zone ID species retained within, including PCT ID	Sensitivity to potential gain
		BC Act	EPBC Act							
					survey ☐ Current survey			76 Low	277 VZ4 PCT 76	
Varied Sittella	<i>Daphoenositta chrysoptera</i>	Vulnerable	Not Listed	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	277 Good 277 Moderate 277 Low 76 Low	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76	Moderate
White-bellied Sea-Eagle (Foraging)	<i>Haliaeetus leucogaster</i>	Vulnerable	Not Listed	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	277 Good 277 Moderate 277 Low 76 Low	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76	High

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Common Name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Associated PCT & veg zones	Vegetation zone ID species retained within, including PCT ID	Sensitivity to potential gain
		BC Act	EPBC Act							
White-throated Needletail	<i>Hirundapus caudacutus</i>	Vulnerable	Vulnerable	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	277 Good 277 Moderate 277 Low 76 Low	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76	High
Yellow-bellied Sheath-tail-bat	<i>Saccolaimus flaviventris</i>	Vulnerable	Not Listed	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	277 Good 277 Moderate 277 Low 76 Low	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76	High

5.1.3. Species credit species

Table 5-2 and

Table 5-3 lists candidate flora and fauna species identified in BAM-C as being associated with the PCTs present within the Development Footprint and requiring targeted surveys. An assessment was undertaken to determine if habitat constraints were present and candidate species could be excluded from targeted surveys. All flora species were retained for targeted surveys.

Six fauna species were excluded from assessment due to having no suitable habitat. These species were:

- Regent Honeyeater
- Large-eared Pied Bat
- Swift Parrot
- Booroolong Frog
- Large Bent-winged Bat
- Brush-tailed Rock-wallaby

Justifications for exclusion of these species are provided in Table 5-3. No additional candidate species were added into the BAM-C.

Table 5-2 Candidate flora species identified in BAM-C and included/excluded from assessment

Common name	Scientific name	Listing status		Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone retained
		BC Act	EPBC Act				
A Speargrass	<i>Austrostipa wakoolica</i>	Endangered	Endangered	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76 VZ5 PCT 76
Ausfeld's Wattle	<i>Acacia ausfeldii</i>	Vulnerable	Not Listed	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76 VZ5 PCT 76
Euphrasia arguta	<i>Euphrasia arguta</i>	Critically Endangered	Critically Endangered	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76 VZ5 PCT 76
Leafless Indigo	<i>Indigofera efoliata</i>	Endangered	Endangered	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76 VZ5 PCT 76

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Common name	Scientific name	Listing status		Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone retained
		BC Act	EPBC Act				
Pine Donkey Orchid	<i>Diuris tricolor</i>	Vulnerable	Not Listed	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76 VZ5 PCT 76
Prasophyllum sp. Wybong	<i>Prasophyllum sp. Wybong</i>	Not Listed	Critically Endangered	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76 VZ5 PCT 76
Sand-hill Spider Orchid	<i>Caladenia arenaria</i>	Endangered	Endangered	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76 VZ5 PCT 76
Silky Swainson-pea	<i>Swainsona sericea</i>	Vulnerable	Not Listed	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76 VZ5 PCT 76
Small Purple-pea	<i>Swainsona recta</i>	Endangered	Endangered	☒ BAM-C ☐ TBDC ☐ Previous survey	Yes	N/A	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277

Common name	Scientific name	Listing status		Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone retained
		BC Act	EPBC Act				
				☐ Current survey			VZ4 PCT 76 VZ5 PCT 76
Small Scurf-pea	<i>Cullen parvum</i>	Endangered	Not Listed	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76 VZ5 PCT 76
Tarengo Leek Orchid	<i>Prasophyllum petilum</i>	Endangered	Endangered	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76 VZ5 PCT 76
Yass Daisy	<i>Ammobium craspedioides</i>	Vulnerable	Vulnerable	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76 VZ5 PCT 76

Table 5-3 Candidate fauna species identified in BAM-C and included/excluded from assessment

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Common name	Scientific name	Listing status		Dual Credit Species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Barking Owl	<i>Ninox connivens</i>	Vulnerable	Not Listed	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☒ Current survey	Yes	N/A	VZ1 PCT 277 VZ2 PCT 277 VZ5 PCT 76
Booroolong Frog	<i>Litoria booroolongensis</i>	Endangered	Endangered	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No	Degraded habitat, absence of suitable aquatic habitat including cobble banks, rock structures within stream margins and permanent streams.	N/A
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	Vulnerable	Not Listed	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	VZ1 PCT 277 VZ2 PCT 277 VZ5 PCT 76
Brush-tailed Rock-wallaby	<i>Petrogale penicillata</i>	Endangered	Vulnerable	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No	Absence of suitable habitat within 1 km of Subject Land including rocky escarpments, gorges, steep slopes, boulder piles, rocky outcrops or cliff lines.	N/A
Bush Stone-curlew	<i>Burhinus grallarius</i>	Endangered	Not Listed	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76 VZ5 PCT 76

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Common name	Scientific name	Listing status		Dual Credit Species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Eastern Pygmy-possum	<i>Cercartetus nanus</i>	Vulnerable	Not Listed	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	VZ1 PCT277 VZ2 PCT 277 VZ5 PCT 76
Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>	Endangered	Endangered	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76 VZ5 PCT 76
Golden Sun Moth	<i>Synemon plana</i>	Vulnerable	Vulnerable	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76 VZ5 PCT 76
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	Vulnerable	Vulnerable	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No	Absence of breeding camps.	N/A
Key's Matchstick Grasshopper	<i>Keyacris scurra</i>	Endangered	Endangered	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	VZ3 PCT 277 VZ4 PCT 76

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Common name	Scientific name	Listing status		Dual Credit Species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Koala	<i>Phascolarctos cinereus</i>	Endangered	Endangered	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	VZ1 PCT 277 VZ2 PCT 277 VZ5 PCT 76
Large Bent-winged Bat	<i>Miniopterus orianae oceanensis</i>	Vulnerable	Not Listed	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	Absence of suitable habitat including caves, tunnels, mines, culverts and other structures known or suspected to be used by the species.	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76 VZ5 PCT 76
Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	Vulnerable	Endangered	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No	Absence of suitable habitat including cliffs, or located within 2 km of rocky areas containing caves, overhangs, escarpments, outcrops, or crevices, or within 2 km of old mines or tunnels.	N/A
Little Eagle	<i>Hieraaetus morphnoides</i>	Vulnerable	Not Listed	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76 VZ5 PCT 76
Masked Owl	<i>Tyto novaehollandiae</i>	Vulnerable	Not Listed	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	VZ1 PCT 277 VZ2 PCT 277 VZ5 PCT 76

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Common name	Scientific name	Listing status		Dual Credit Species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Pink Cockatoo	<i>Lophochroa leadbeateri</i>	Vulnerable	Endangered	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76 VZ5 PCT 76
Pink-tailed Legless Lizard	<i>Aprasia parapulchella</i>	Vulnerable	Vulnerable	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76 VZ5 PCT 76
Regent Honeyeater	<i>Anthochaera phrygia</i>	Critically Endangered	Critically Endangered	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No	Area is outside of the important mapped habitat for this species.	N/A
Sloane's Froglet	<i>Crinia sloanei</i>	Endangered	Endangered	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	Waterbodies VZ3 PCT 277 VZ5 PCT 76
South-eastern Glossy Black-Cockatoo	<i>Calyptrorhynchus lathami lathami</i>	Vulnerable	Vulnerable	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76 VZ5 PCT 76

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Common name	Scientific name	Listing status		Dual Credit Species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Southern Myotis	<i>Myotis macropus</i>	Vulnerable	Not Listed	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	VZ1 PCT 277 VZ2 PCT 277 VZ5 PCT 76
Square-tailed Kite	<i>Lophoictinia isura</i>	Vulnerable	Not Listed	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76 VZ5 PCT 76
Squirrel Glider	<i>Petaurus norfolcensis</i>	Vulnerable	Not Listed	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☒ Current survey	Yes	N/A	VZ1 PCT 277 VZ2 PCT 277 VZ5 PCT 76
Squirrel Glider in the Wagga Wagga Local Government Area	<i>Petaurus norfolcensis</i> – <i>endangered population</i>	Endangered Population	Not Listed	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☒ Current survey	Yes	N/A	VZ1 PCT 277 VZ2 PCT 277 VZ5 PCT 76
Striped Legless Lizard	<i>Delma impar</i>	Vulnerable	Vulnerable	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76 VZ5 PCT 76

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Common name	Scientific name	Listing status		Dual Credit Species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Superb Parrot	<i>Polytelis swainsonii</i>	Vulnerable	Vulnerable	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76 VZ5 PCT 76
Swift Parrot	<i>Lathamus discolor</i>	Endangered	Critically Endangered	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No	Area is outside of the important mapped habitat for this species.	N/A
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	Vulnerable	Not Listed	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	VZ1 PCT 277 VZ2 PCT 277 VZ3 PCT 277 VZ4 PCT 76 VZ5 PCT 76

5.2. Presence of candidate species credit species

Table 5-4 shows the method used to determine presence or absence of potential candidate flora species, whether species was observed and whether species qualifies as a candidate species credit species. Table 5-5 shows the method used to determine presence or absence of potential candidate fauna species, whether species was observed and whether species qualifies as a candidate species credit species. Targeted surveys are required in the Development Footprint for the species that require further assessment.

Table 5-4 Determining the presence of candidate flora species credit species on the Subject Land

Common name	Scientific name	Listing status		Method used to determine presence	Present?	Further assessment required? (BAM Subsections 5.2.5 and 5.2.6)
		BC Act	EPBC Act			
A Speargrass	<i>Austrostipa wakoolica</i>	E	E	Assumed present	Assumed present	Yes
Ausfeld's Wattle	<i>Acacia ausfeldii</i>	V	Not Listed	Targeted threatened species survey	No	No
Euphrasia arguta	<i>Euphrasia arguta</i>	CE	CE	Assumed present	Assumed present	Yes
Leafless Indigo	<i>Indigofera efoliata</i>	E	E	Targeted threatened species survey	No	Yes
Pine Donkey Orchid	<i>Diuris tricolor</i>	V	Not Listed	Targeted threatened species survey	No	No
Prasophyllum sp. Wybong	<i>Prasophyllum sp. Wybong</i>	Not Listed	CE	Targeted threatened species survey	No	Yes Additional survey required in October
Sand-hill Spider Orchid	<i>Caladenia arenaria</i>	E	E	Targeted threatened species survey	No	No
Silky Swainson-pea	<i>Swainsona sericea</i>	V	Not Listed	Targeted threatened species survey	No	No
Small Purple-pea	<i>Swainsona recta</i>	E	E	Targeted threatened species survey	No	No
Small Scurf-	<i>Cullen</i>	E	Not Listed	Targeted	No	No

Common name	Scientific name	Listing status		Method used to determine presence	Present?	Further assessment required? (BAM Subsections 5.2.5 and 5.2.6)
		BC Act	EPBC Act			
pea	<i>parvum</i>			threatened species survey		
Tarengo Leek Orchid	<i>Prasophyllum petilum</i>	E	E	Targeted threatened species survey	Assumed present	Yes
Yass Daisy	<i>Ammobium craspedioides</i>	V	V	Assumed present	Assumed present	Yes

Table 5-5 Determining the presence of candidate fauna species credit species on the Subject Land

Common name	Scientific name	Listing status		Method used to determine presence	Present?	Further assessment required? (BAM Subsections 5.2.5 and 5.2.6)
		BC Act	EPBC Act			
Barking Owl	<i>Ninox connivens</i>	V	Not Listed	Targeted threatened species survey	Yes	No
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	V	Not Listed	Targeted threatened species survey	No	No
Bush Stone-curlew	<i>Burhinus grallarius</i>	E	Not Listed	Targeted threatened species survey	No	No
Eastern Pygmy Possum	<i>Cercartetus nanus</i>	V	Not Listed	Targeted threatened species survey	No	No
Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>	E	E	Targeted threatened species survey	No	No
Golden Sun Moth	<i>Synemon plana</i>	V	V	Assumed present	Assumed present	Yes
Key's Matchstick Grasshopper	<i>Keyacris scurra</i>	E	E	Targeted threatened species survey	No	No
Koala	<i>Phascolarctos cinereus</i>	E	E	Targeted threatened species survey	No	No
Little Eagle	<i>Hieraaetus morphnoides</i>	V	Not Listed	Targeted threatened species survey	No	No
Masked Owl	<i>Tyto novaehollandiae</i>	V	Not Listed	Targeted threatened species survey	Yes	No
Pink Cockatoo	<i>Lophochroa leadbeateri</i>	V	E	Targeted threatened	No	No

Common name	Scientific name	Listing status		Method used to determine presence	Present?	Further assessment required? (BAM Subsections 5.2.5 and 5.2.6)
		BC Act	EPBC Act			
				species survey		
Pink-tailed Legless Lizard	<i>Aprasia parapulchella</i>	V	V	Expert report	No	No
Sloane's Froglet	<i>Crinia sloanei</i>	E	E	Targeted threatened species survey	No	No
South-eastern Glossy Black-Cockatoo	<i>Calyptorhynchus lathami lathami</i>	V	V	Targeted threatened species survey	No	No
Southern Myotis	<i>Myotis macropus</i>	V	Not Listed	Targeted threatened species survey	Yes	No
Square-tailed Kite	<i>Lophoictinia isura</i>	V	Not Listed	Targeted threatened species survey	No	No
Squirrel Glider	<i>Petaurus norfolcensis</i>	V	Not Listed	Targeted threatened species survey	Yes	No
Squirrel Glider in the Wagga Wagga Local Government Area	<i>Petaurus norfolcensis</i> – endangered population	V	Not Listed	Targeted threatened species survey	Yes	No
Striped Legless Lizard	<i>Delma impar</i>	V	V	Assumed present	Assumed present	Yes
Superb Parrot	<i>Polytelis swainsonii</i>	V	V	Targeted threatened species survey	No	No

Common name	Scientific name	Listing status		Method used to determine presence	Present?	Further assessment required? (BAM Subsections 5.2.5 and 5.2.6)
		BC Act	EPBC Act			
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	V	Not Listed	Targeted threatened species survey	No	No

5.3. Threatened species surveys

5.3.1. Specific flora survey requirements and guidelines

The following guidelines and notes were followed for the surveys described in Table 5-4:

- NSW Government DPIE *Surveying threatened plants and their habitats* (DPIE, 2020).
- NSW BioNet Threatened Biodiversity Profile Data Collection (NSW DCCEEW, 2024).

Parallel field traverses were undertaken at 10 m intervals across the Subject Land at suitable time periods for the Ausfeld's Wattle (*Acacia ausfeldii*), Small Scurf-pea (*Cullen parvum*), Leafless Indigo (*Indigofera efoliata*), Pine Donkey Orchid (*Diuris tricolor*), Prasophyllum sp. Wybong, Tarengo Leek Orchid (*Prasophyllum petilum*), Sand-hill Spider Orchid (*Caladenia arenaria*), Silky Swainson-pea (*Swainsona sericea*) and Small Purple-pea (*Swainsona recta*). Two ecologists walked transects together where there were species in different strata or more than five species in one stratum, with target species split between them. Table 5-6 details the threatened survey methodology, timing and effort for threatened flora surveys. Flora survey effort to date is mapped in Figure 5-2, Figure 5-3 and Figure 5-4. Due to a technical error with the GPS recording, no track logs for the flora surveys were recorded and only the start and end points have a GPS location.

Table 5-6 Threatened species surveys for candidate flora species credit species on the Subject Land

Common name	Scientific name	Threatened flora species surveys				Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)	
		Survey method (transects or grids)	Recommended Survey Period	Timing of survey – within recommended period? (BAM-C / TBDC)				Effort (hours & no. people)
Ausfeld’s Wattle	<i>Acacia ausfeldii</i>	Habitat searches	August - October	☒ Yes September 2025	☐ No	September 2025: Two ecologists (2 hours)	No	No
Small Scurf-pea	<i>Cullen parvum</i>	Parallel field traverses 10 m apart (open vegetation)	December - January	☒ Yes January 2025	☐ No	January 2025: Two ecologists (2 hours)	No	No
Leafless Indigo	<i>Indigofera efoliata</i>	Parallel field traverses 10 m apart (open vegetation)	September – October	☒ Yes September 2025	☐ No	September 2025: Two ecologists (7 hours)	No	No
Pine Donkey Orchid	<i>Diuris tricolor</i>	Parallel field traverses 10 m apart (open vegetation)	September – October	☒ Yes September 2025	☐ No	September 2025: Two ecologists (7 hours)	No	No
Prasophyllu m sp. Wybong	<i>Prasophyllu m sp. Wybong</i>	Parallel field traverses 10 m apart (open	September – October	☒ Yes September 2025	☐ No	September 2025: Two ecologists (7 hours)	No	Yes Additional survey required in

Common name	Scientific name	Threatened flora species surveys				Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)	
		Survey method (transects or grids)	Recommended Survey Period	Timing of survey – within recommended period? (BAM-C / TBDC)				Effort (hours & no. people)
		vegetation)						October
Tarengo Leek Orchid	<i>Prasophyllum petilum</i>	Parallel field traverses 10 m apart (open vegetation)	September – October	☒ Yes September 2025	☐ No	September 2025: Two ecologists (7 hours)	No	No
Sand-hill Spider Orchid	<i>Caladenia arenaria</i>	Parallel field traverses 10 m apart (open vegetation)	September	☒ Yes September 2025	☐ No	September 2025: Two ecologists (7 hours)	No	No
Silky Swainson-pea	<i>Swainsona sericea</i>	Parallel field traverses 10 m apart (open vegetation)	September – November	☒ Yes September 2025	☐ No	September 2025: Two ecologists (7 hours)	No	No
Small Purple-pea	<i>Swainsona recta</i>	Parallel field traverses 10 m apart (open vegetation)	September – November	☒ Yes September 2025	☐ No	September 2025: Two ecologists (7 hours)	No	No

5.3.2. Specific fauna survey requirements and guidelines

Along with *Threatened Biodiversity Survey & Assessment* (DEC, 2004) and survey comments in the Threatened Biodiversity Data Collection (TBDC) for individual species, the following guidelines were used for particular species groups:

- Amphibians: *NSW Guide for the survey of threatened frogs and their habitats for the Biodiversity Assessment Method* (DPIE, NSW Guide for Threatened Frogs, 2020).
- Bats: *'Species credit' threatened bats and their habitats, NSW survey guide for the Biodiversity Assessment Method* (OEH, 2018).
- Birds: *Survey guidelines for Australia's threatened birds* (DEWHA, 2010) was used to for broad survey method in terms of evidence of presence and characterising habitat.
- Koala: *Biodiversity Assessment Method Survey Guide for Koalas* (DPE, 2022).
- Mammals: *Survey guidelines for Australia's threatened mammals* (DCCEEW (Cwth), 2011)
Mountain Pygmy-possum *Burramys parvus* was used in conjunction with relevant literature.

Table 5-7 details the threatened survey methodology, timing and effort for threatened fauna surveys. Fauna survey effort to date is mapped in Figure 5-5, Figure 5-6 and Figure 5-7 for species surveyed in January 2025, in Figure 5-8, Figure 5-9 and Figure 5-10 for species surveyed in March 2025, in Figure 5-11, Figure 5-12 and Figure 5-13 for species surveyed in August 2025 and in Figure 5-14, Figure 5-15 and Figure 5-16 for species surveyed in September 2025.

Table 5-7 Threatened species surveys for candidate fauna species credit species on the Subject Land

Common name	Scientific name	Threatened fauna species surveys				Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)	
		Survey method (e.g. harp trap, Elliott trap, bioacoustics, etc.)	Recommended Survey Period	Timing of survey – within recommended period? (BAM-C / TBDC)				Effort (hours & no. people)
Barking Owl	<i>Ninox connivens</i>	Spotlighting and call playback surveys	All year	☒ Yes March 2025	☐ No	20 minutes call playback = each survey 20 x 3 sites per night = 60 minutes per night 60 x 6 survey night repeats = 360 minutes survey effort, two people	Yes	No
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	Spotlighting and camera bait trapping	January - June	☒ Yes March 2025	☐ No	4 spotlighting transects = 1800m total x 2 repeats each = 3600m 28 nights of baited camera traps	No	No
Bush Stone-curlew	<i>Burhinus grallarius</i>	Spotlighting and call playback surveys	All year	☒ Yes March 2025	☐ No	20 minutes call playback = each survey 20 x 2 sites per night = 40 minutes per night 40 x 6 survey night repeats = 240 minutes survey effort, two people	No	No
Eastern	<i>Cercartetus</i>	Spotlighting and	October - March	☒ Yes	☐ No	4 spotlighting transects = 1800m	No	No

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Common name	Scientific name	Threatened fauna species surveys				Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)	
		Survey method (e.g. harp trap, Elliott trap, bioacoustics, etc.)	Recommended Survey Period	Timing of survey – within recommended period? (BAM-C / TBDC)				Effort (hours & no. people)
Pygmy Possum	<i>nanus</i>	camera bait trapping		March 2025		total x 2 repeats each = 3600m 28 nights of baited camera traps		
Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>	Diurnal bird surveys	December - January	☒ Yes January 2025	☐ No	Diurnal bird surveys undertaken by 2x ecologists at 8 locations along the access track. Included 20 minutes of HBT watches within 4 hours before sunset and 4 hours after sunset. Methodology was repeated over 4 days.	No	No
Key’s Matchstick Grasshopper	<i>Keyacris scurra</i>	Use of netting and pouter within native grass patches	March – May & September - November	☒ Yes March 2025	☐ No	2 hours searching habitat x 4-day repeats = 8 hours effort, 2 people	No	No
Koala	<i>Phascolarctos cinereus</i>	Spot Assessment Technique (SAT) and spotlighting	All year	☒ Yes March 2025 April 2025	☐ No	4 spotlighting transects = 1800m total x 2 repeats each = 3600m + 5 koala SAT sites where each SAT tree was identified as a centre tree through the grid spacing methodology. Two ecologists moved outwards from	No	No

Common name	Scientific name	Threatened fauna species surveys				Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)	
		Survey method (e.g. harp trap, Elliott trap, bioacoustics, etc.)	Recommended Survey Period	Timing of survey – within recommended period? (BAM-C / TBDC)				Effort (hours & no. people)
						each centre tree, identifying the nearest 29 trees from the centre tree while searching for koala scat beneath each tree. 30 searched trees x 5 SAT sites = 150 total trees surveyed for scats.		
Masked Owl	<i>Tyto novaehollandiae</i>	Call playback and Spotlighting	All year	☒ Yes March 2025	☐ No	20 minutes call playback = each survey 20 x 3 sites per night = 60 minutes per night 60 x 6 survey night repeats = 360 minutes survey effort, two people	Yes	No
Sloane’s Froglet	<i>Crinia sloanei</i>	Call-playback and spotlighting	July - August	☒ Yes August 2025	☐ No	Call-playback methodology with spotlighting was undertaken by 2x ecologists across 4 nights. Surveys were conducted in areas of potential habitat within the Subject Land and within 200 m of the Subject Land, including farm dams, creeks and vegetated	No	No

Common name	Scientific name	Threatened fauna species surveys				Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)	
		Survey method (e.g. harp trap, Elliott trap, bioacoustics, etc.)	Recommended Survey Period	Timing of survey – within recommended period? (BAM-C / TBDC)				Effort (hours & no. people)
						depressions.		
South-eastern Glossy-Black Cockatoo	<i>Calyptorhynchus lathamii lathamii</i>	Diurnal area searches	April - August	☒ Yes August 2025	☐ No	Area searches were undertaken by 2x ecologists at 8 locations within and adjacent to the Subject Land in areas with HBTs. Area searches were conducted on foot over 4 nights, 2 hours prior to sunset. One morning survey was conducted on the fifth day in the same locations, 2 hours following sunrise.	No	No
Southern Myotis	<i>Myotis macropus</i>	Bioacoustics (Anabat)	October - March	☒ Yes March 2025	☐ No	5 nights of passive acoustic recorders (ANABATs) at each of 5 farm dams.	Yes	No
Square-tailed Kite	<i>Lophoictinia isura</i>	Stick nest searches	September – January	☒ Yes January 2025	☐ No	2x ecologists conducted one day of stick nest searches in areas of potential suitable habitat across the Subject Land and woodland area directly adjacent.	No	No

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Common name	Scientific name	Threatened fauna species surveys				Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)	
		Survey method (e.g. harp trap, Elliott trap, bioacoustics, etc.)	Recommended Survey Period	Timing of survey – within recommended period? (BAM-C / TBDC)				Effort (hours & no. people)
Squirrel Glider	<i>Petaurus norfolcensis</i>	Spotlighting and camera bait trapping	All year	☒ Yes March 2025	☐ No	4 spotlighting transects = 1800 m total x 2 repeats each = 3600 m 28 nights of baited camera traps	Yes	No
Squirrel Glider in the Wagga Wagga Local Government Area	<i>Petaurus norfolcensis</i> – <i>endangered population</i>	Spotlighting and camera bait trapping	All year	☒ Yes March 2025	☐ No	4 spotlighting transects = 1800 m total x 2 repeats each = 3600 m 28 nights of baited camera traps	Yes	No
Superb Parrot	<i>Polytelis swainsonii</i>	Diurnal area searches	September – November	☒ Yes September 2025	☐ No	Area searches were undertaken by 2x ecologists at 8 locations within and adjacent to the Subject Land in areas with HBTs. Area searches were conducted on foot over 3 mornings, 3 hours following sunrise. One afternoon survey was conducted in the same locations, 3 prior to sunset.	No	No
Pink	<i>Lophochroa</i>	Diurnal area searches	September –	☒ Yes	☐ No	Area searches were undertaken by 2x ecologists at 8 locations	No	No

Common name	Scientific name	Threatened fauna species surveys				Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)	
		Survey method (e.g. harp trap, Elliott trap, bioacoustics, etc.)	Recommended Survey Period	Timing of survey – within recommended period? (BAM-C / TBDC)				Effort (hours & no. people)
Cockatoo	<i>leadbeateri</i>		December	September 2025		within and adjacent to the Subject Land in areas with HBTs. Area searches were conducted on foot over 3 mornings, 3 hours following sunrise. One afternoon survey was conducted in the same locations, 3 prior to sunset.		
Little Eagle	<i>Hieraaetus morphnoides</i>	Stick nest searches	August – October	☒ Yes September 2025	☐ No	2x ecologists conducted one day of stick nest searches in areas of potential suitable habitat across the Subject Land and woodland area directly adjacent.	No	No
White-bellied Sea Eagle	<i>Haliaeetus leucogaster</i>	Stick nest searches	July – December	☒ Yes September 2025	☐ No	2x ecologists conducted one day of stick nest searches in areas of potential suitable habitat across the Subject Land and woodland area directly adjacent.	No	No

5.4. Expert reports

Expert reports have been sought for the following species (Capital Ecology, 2025);

- Striped Legless Lizard (*Delma impar*)
- Golden Sun Moth (*Synemon plana*)
- Pink-tailed Legless Lizard (*Aprasia parapulchella*)

Pink-tailed Legless Lizard was excluded from the assessment as the advice from R. Speirs included that the subject land does not occur in the predictive model footprint (NSW DCCEEW, 2025) (Capital Ecology, 2025) for the species and therefore it does not support suitable habitat (Figure 5-1). No further assessment was required for the Pink-tailed Legless Lizard.



Figure 5-1 Distribution of the Pink-tailed Legless Lizard in proximity to the Subject Land (Capital Ecology, 2025)

Results of the expert reports for the Golden Sun Moth and Striped Legless Lizard are still pending and will be provided during the Response to Submissions Phase.



Figure 5-2 Flora survey effort and targeted survey locations – Map 1 of 3 (NGH, 2025)

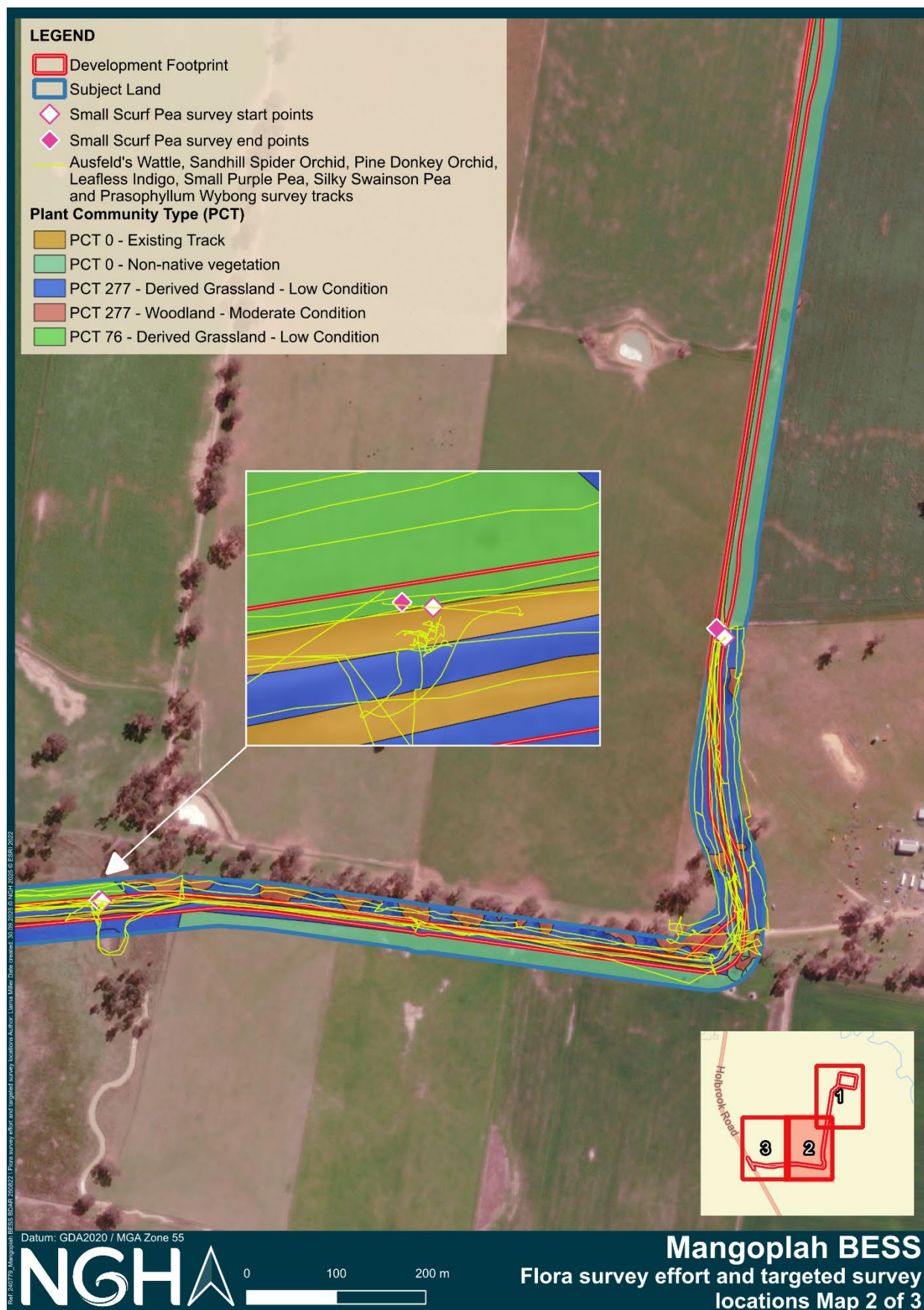


Figure 5-3 Flora survey effort and targeted survey locations – Map 2 of 3 (NGH, 2025)

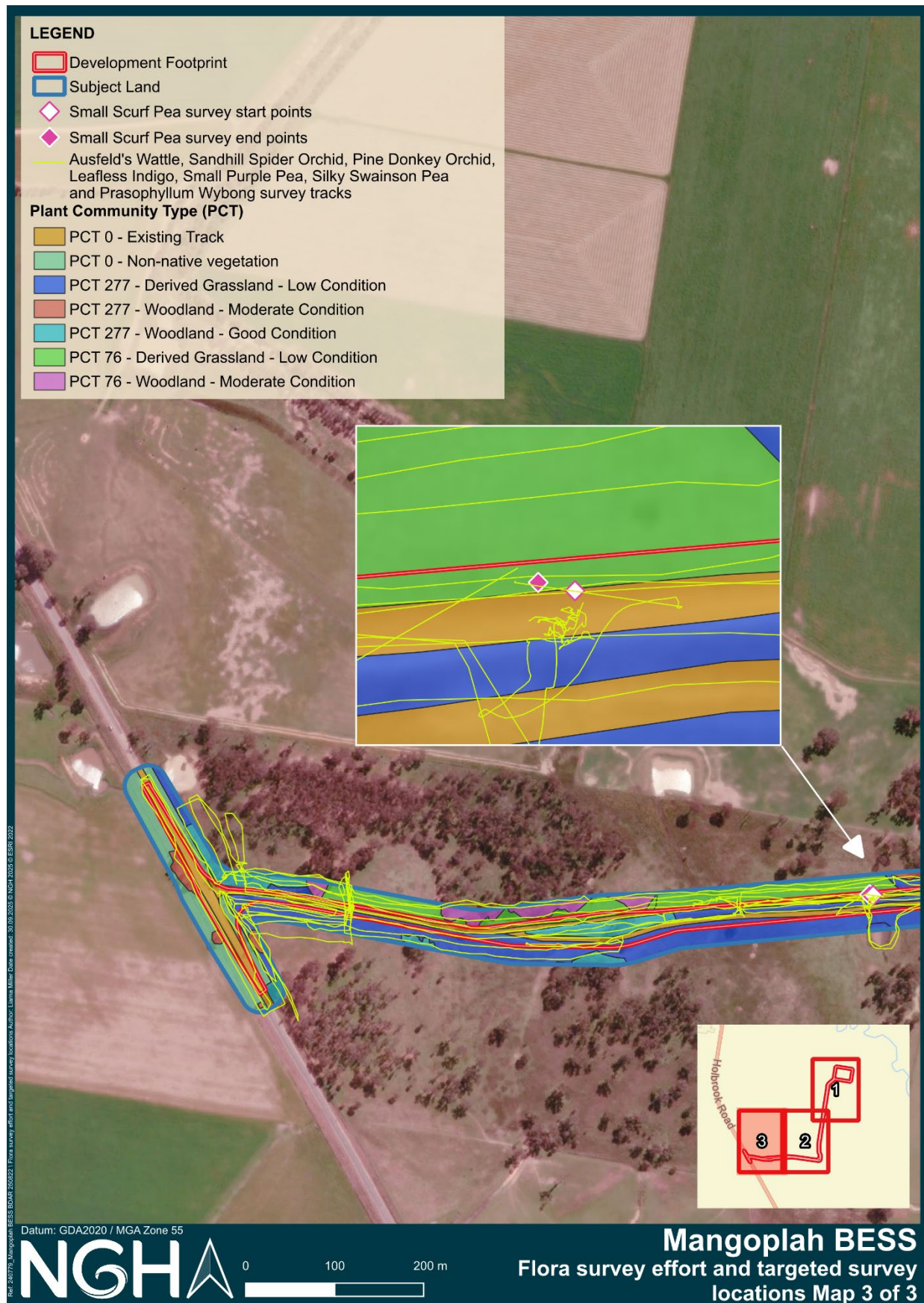


Figure 5-4 Flora survey effort and targeted survey locations – Map 3 of 3 (NGH, 2025)



Figure 5-5 January 2025 fauna survey effort and targeted survey location – Map 1 of 3 (NGH, 2025)



Figure 5-6 January 2025 fauna survey effort and targeted survey location - Map 2 of 3 (NGH, 2025)



Figure 5-7 January 2025 fauna survey effort and targeted survey location - Map 3 of 3 (NGH, 2025)

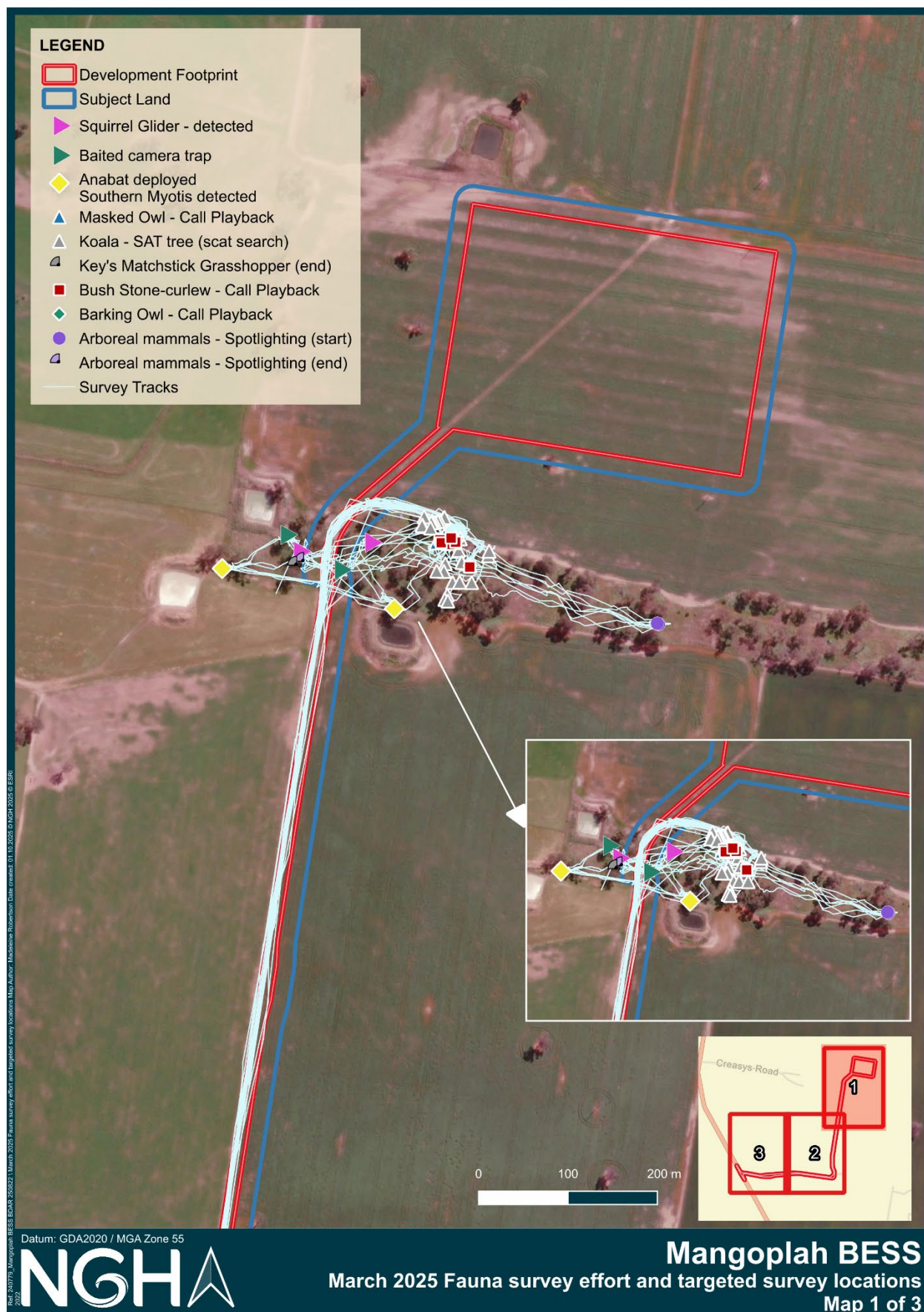


Figure 5-8 March 2025 fauna survey effort and targeted survey locations – Map 1 of 3 (NGH, 2025)

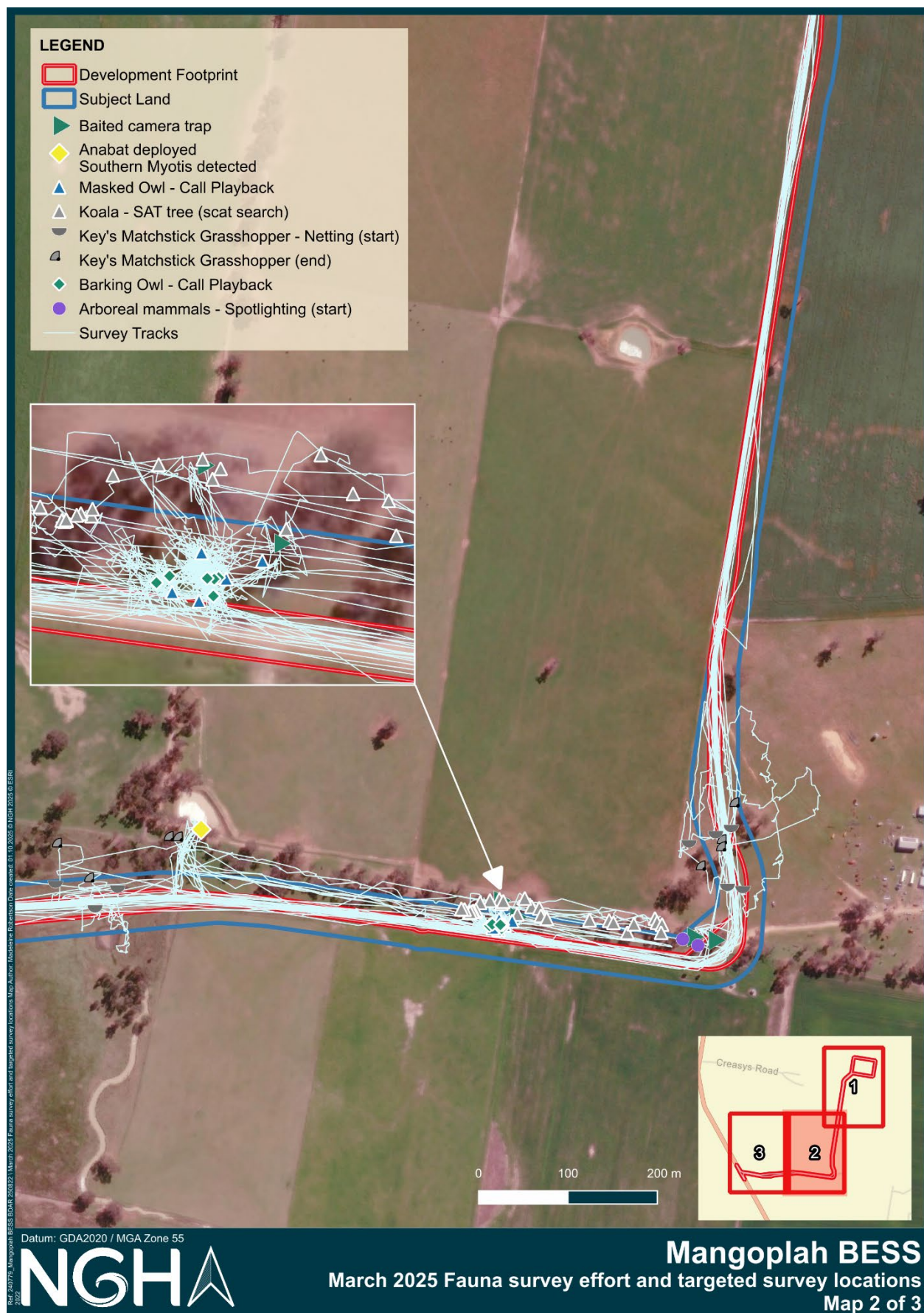


Figure 5-9 March 2025 fauna survey effort and targeted survey locations – Map 2 of 3 (NGH, 2025)

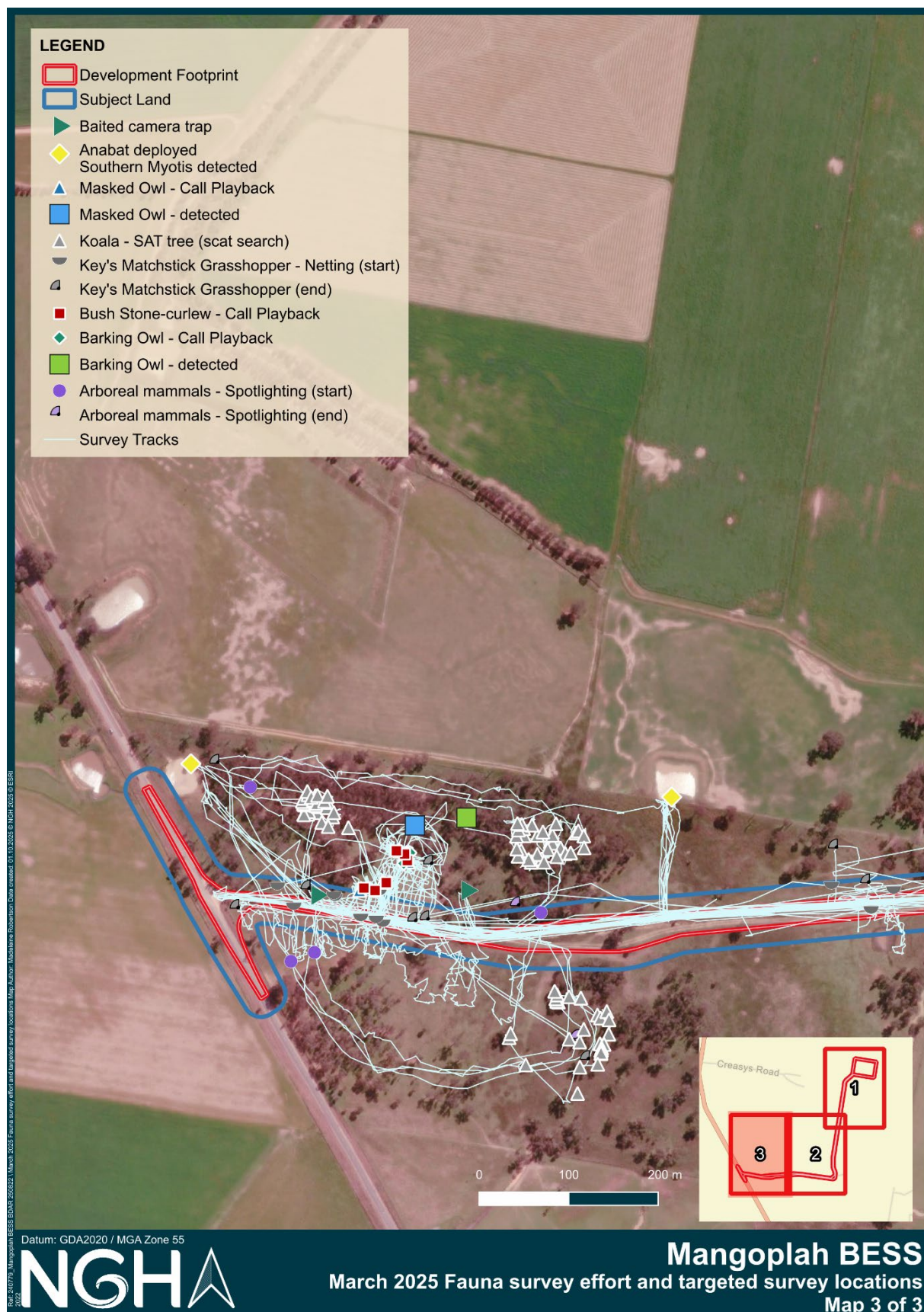


Figure 5-10 March 2025 fauna survey effort and targeted survey locations – Map 3 of 3 (NGH, 2025)

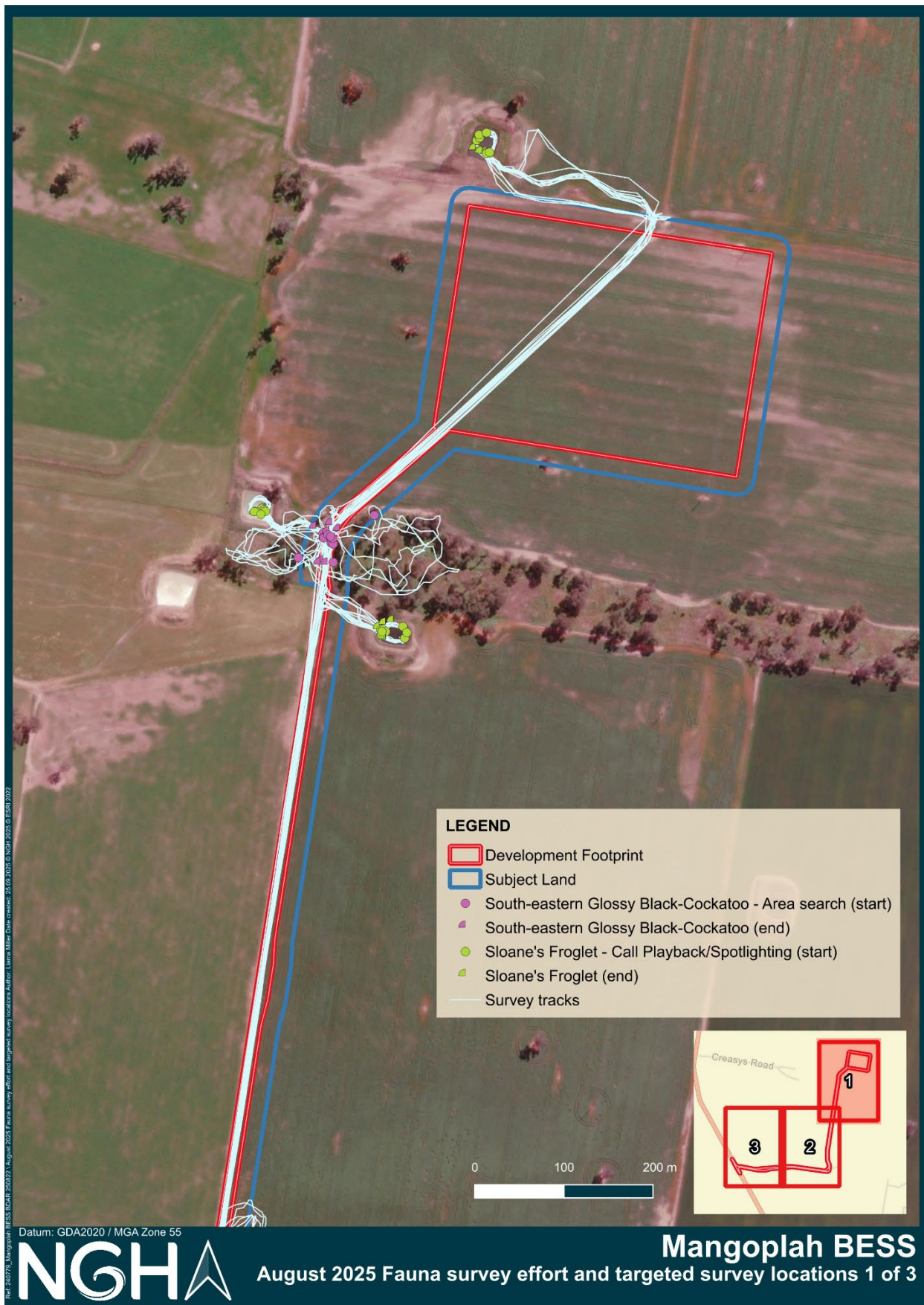


Figure 5-11 August 2025 fauna survey effort and targeted survey locations – Map 1 of 3 (NGH, 2025)

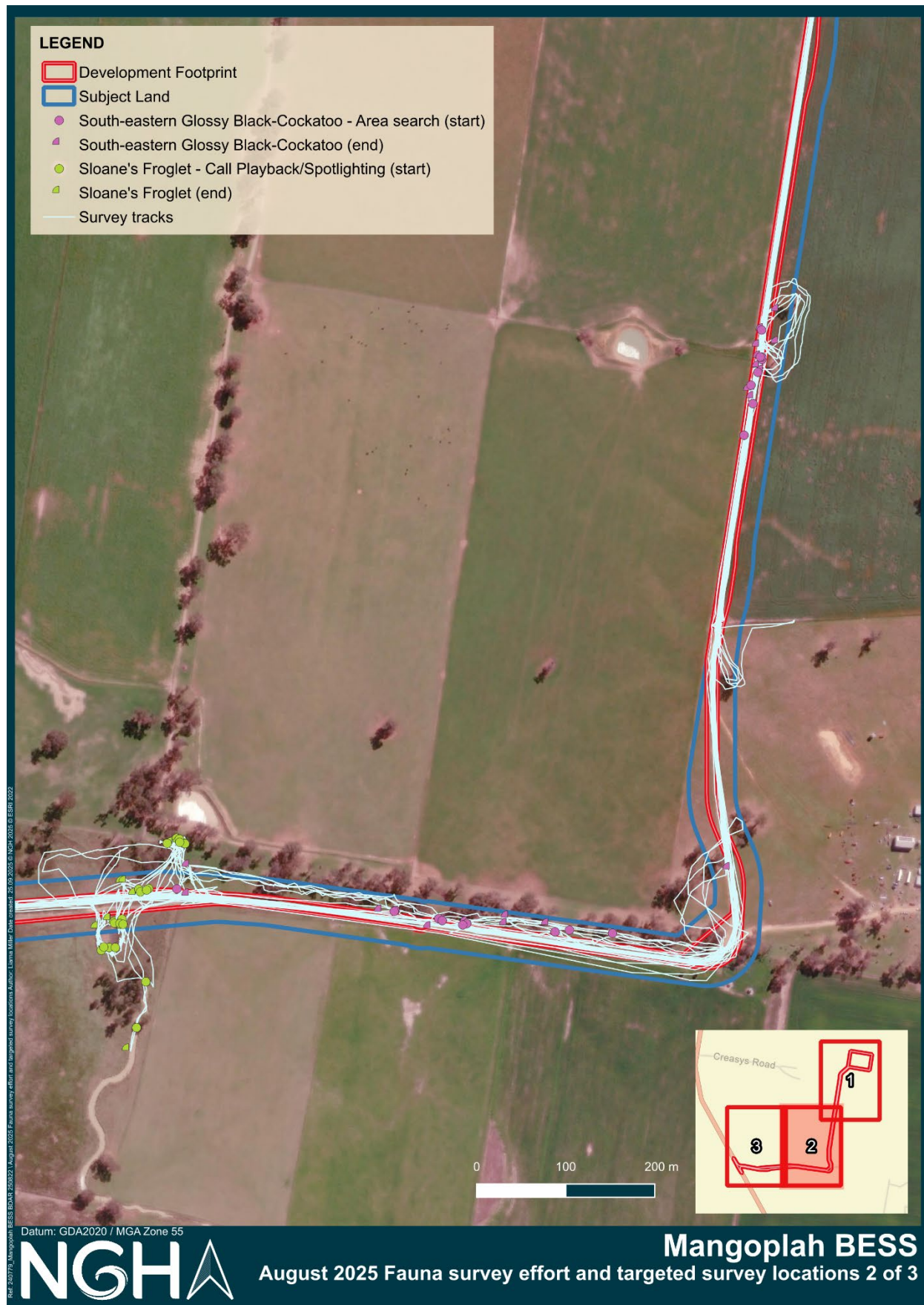


Figure 5-12 August 2025 fauna survey effort and targeted survey locations – Map 2 of 3 (NGH, 2025)

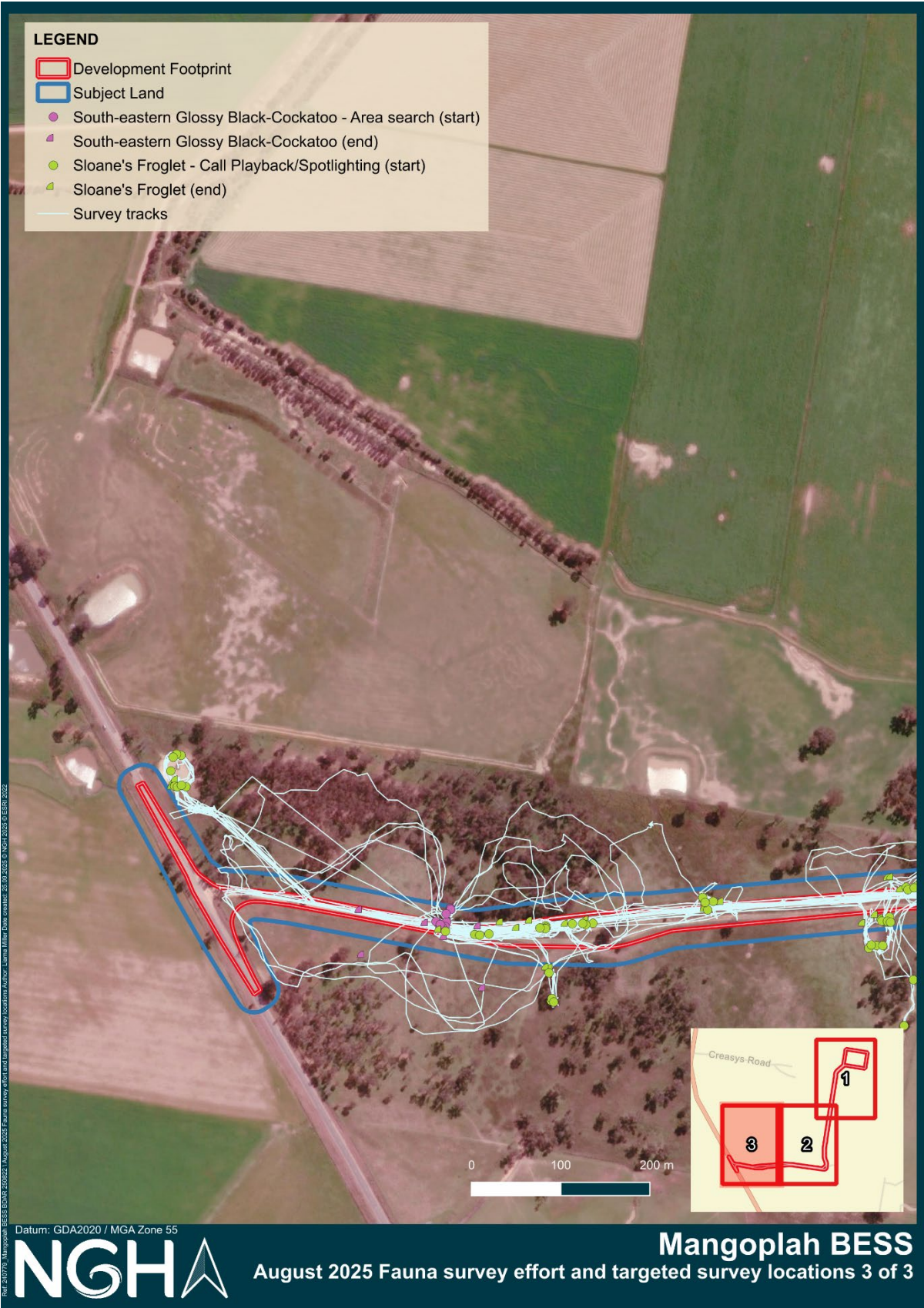


Figure 5-13 August 2025 fauna survey effort and targeted survey locations – Map 3 of 3 (NGH, 2025)



Figure 5-14 September 2025 fauna survey effort and targeted survey locations – Map 1 of 3 (NGH, 2025)

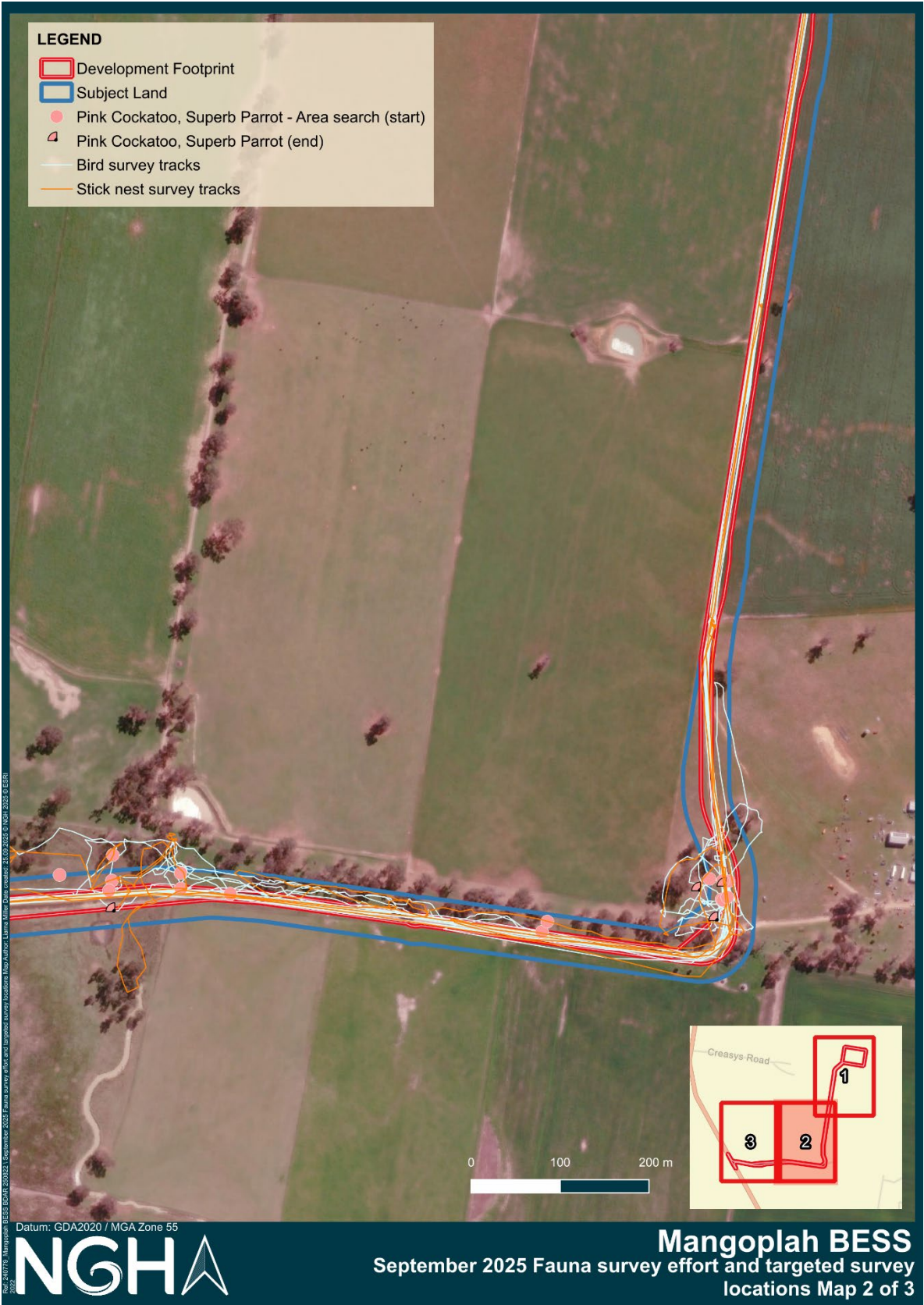


Figure 5-15 September 2025 fauna survey effort and targeted survey locations – Map 2 of 3 (NGH, 2025)



Figure 5-16 September 2025 fauna survey effort and targeted survey locations – Map 3 of 3 (NGH, 2025)

5.5. Area or count, and location of suitable habitat for a species credit species (a species polygon)

Species polygons were created for all species present or assumed present within the Subject Land. Details of each species polygon are described below.

Threatened flora

A separate species polygon was created for each of the below flora species including:

- A Spear-grass (*Austrostipa wakoolica*)
- Euphrasia arguta (*Euphrasia arguta*)
- Yass Daisy (*Ammobium craspedioides*).

There are no species polygon requirements listed in the TBDC for the above flora species (OEH, 2025). A species polygon was created for each of the above threatened flora species, (apart from Yass Daisy) as presence is assumed and both PCT 76 and PCT 277 have the potential to support these species. Since all of the above listed flora species have the same species polygon, they are represented in Figure 5-17 as one polygon. All zones of PCT 277 and PCT 76 were considered suitable habitat for these species totalling an area of 2.00 ha.

Yass Daisy is a species assessed by count. As this species is assumed present, a count of individuals is not available. An estimate of 40 individuals was given, however it is noted that targeted surveys would be undertaken during Spring to confirm its presence or absence.

Barking Owl and Masked Owl

The species polygon was drawn to include all vegetation zones within 800 m from the location of the detected owl, and containing a living or dead tree with a hollow >20 cm diameter that occurs >4 m above the ground, as per the TBDC (OEH, 2025). The location of the detected owls were determined by estimating the distance and direction of the call. The species polygons for Barking Owl and Masked Owl are presented in Figure 5-18.

Golden Sun Moth

Species polygon requirements for the Golden Sun Moth includes all suitable habitat on the Subject Land containing tussock grasses such as *Rytidosperma* and *Austrostipa* spp. Suitable habitat is described in the TBDC as any associated PCTs with the species where habitat constraints are present (OEH, 2025). Since presence is assumed for this species, the species polygon was created to include all suitable habitat on the Subject Land, therefore all native vegetation within the Subject Land, as shown in Figure 5-19.

Pink-tailed Legless Lizard

Suitable habitat is determined by TBDC as rocky areas located within associated PCTs (OEH, 2025). Since presence is assumed, species polygons were created to include all areas of PCT 277 and PCT 76 within the Subject Land. The species polygon is presented in Figure 5-19.

Southern Myotis

Southern Myotis is a fauna species assessed by area. The species polygon map was determined by identifying and applying a 200 m buffer to habitat features (farm dams) on the Subject Land where the species was detected. All associated PCTs that intersected with the Subject Land were selected and form the species polygon. This method was applied with reference to the '*Species credit' threatened bats and their habitats: NSW guide for the Biodiversity Assessment Method* (DPIE, 2021) and the TBDC (OEH, 2025). Southern Myotis species polygon is presented in Figure 5-20.

Squirrel Glider

There are no species polygon requirements listed in the TBDC for the Squirrel Glider (OEH, 2025). The species polygon was drawn to areas of woodland within the Subject Land where the species was detected. The species polygon did not include woodland areas or scattered trees that were more than 50 m apart from the known location in the northern section of the Subject Land. Squirrel Gliders require woodland or scattered trees within close proximity. Habitat connectivity for the Squirrel Glider was therefore absent between the north and south of the Subject Land. Therefore, woodland in the northern section of the Subject Land made up the species polygon for the Squirrel Glider, as shown in Figure 5-21.

Striped Legless Lizard

Suitable habitat is determined by TBDC as all PCTs on the Subject Land associated with the species (OEH, 2025). Since presence is being assumed, the species polygon was created to include all areas of PCT 277 and PCT 76 within the Subject Land. The species polygon for the Striped Legless Lizard is presented in Figure 5-19.

5.5.1. Justification for selecting areas for species polygons

Species polygons have been determined in accordance with BAM and associated guidelines, as listed above.

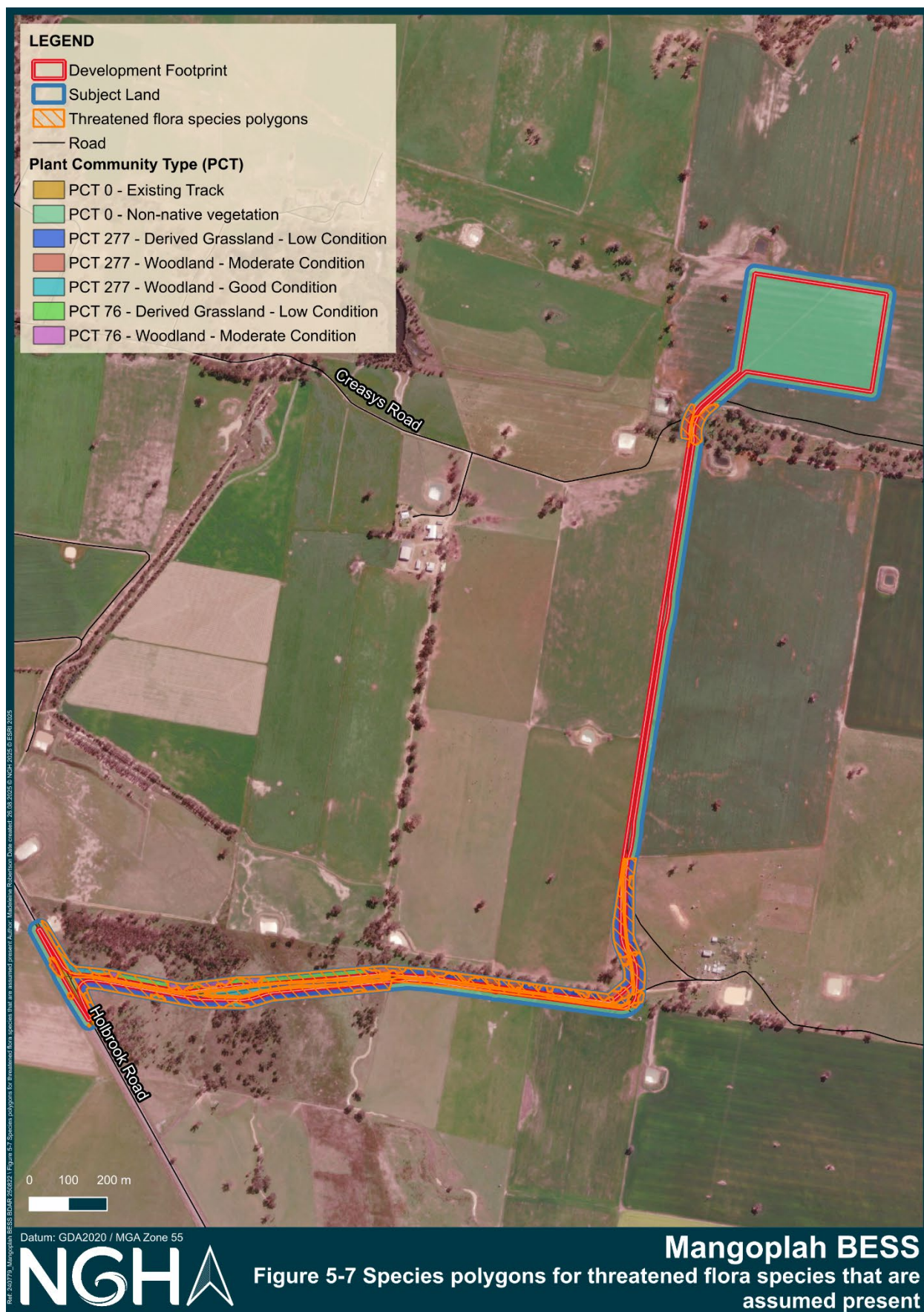


Figure 5-17 Species polygons for threatened flora species that are assumed present (NGH, 2025)

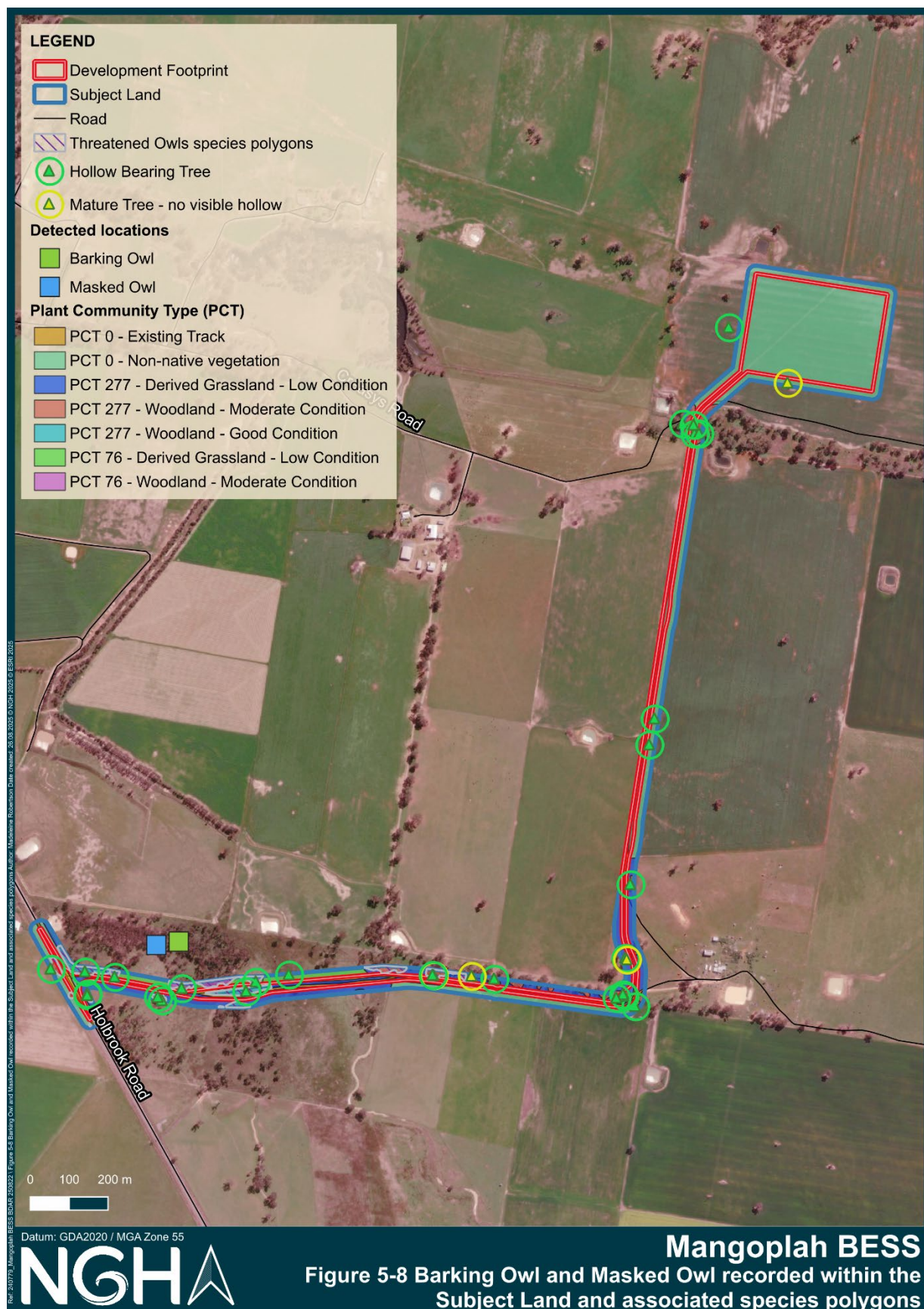


Figure 5-18 Barking Owl and Masked Owl recorded within the Subject Land and associated species polygons (NGH, 2025)

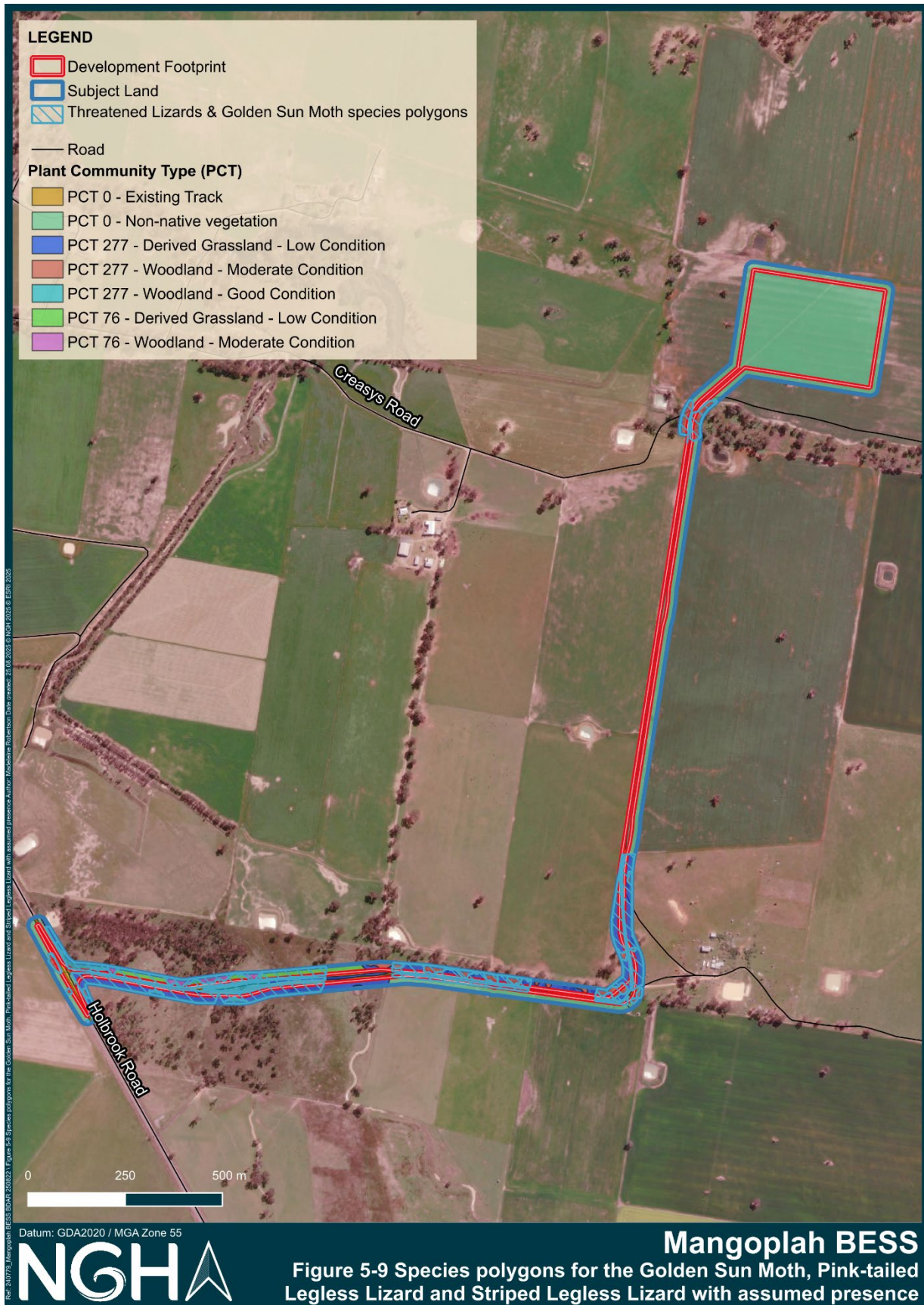


Figure 5-19 Species polygons for the Golden Sun Moth, Pink-tailed Legless Lizard and Striped Legless Lizard with assumed presence (NGH, 2025)

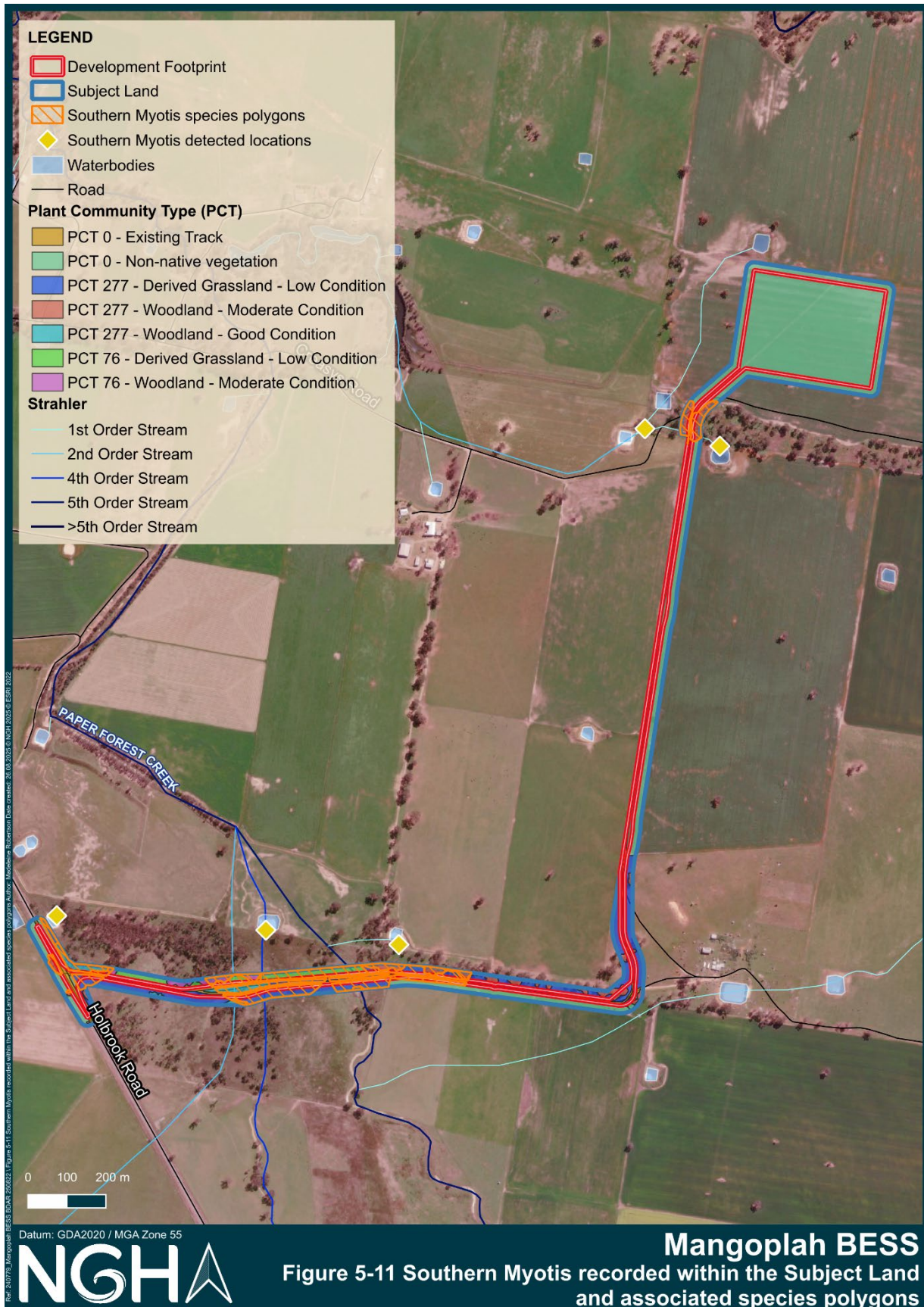


Figure 5-20 Southern Myotis recorded within the Subject Land and associated species polygons (NGH, 2025)

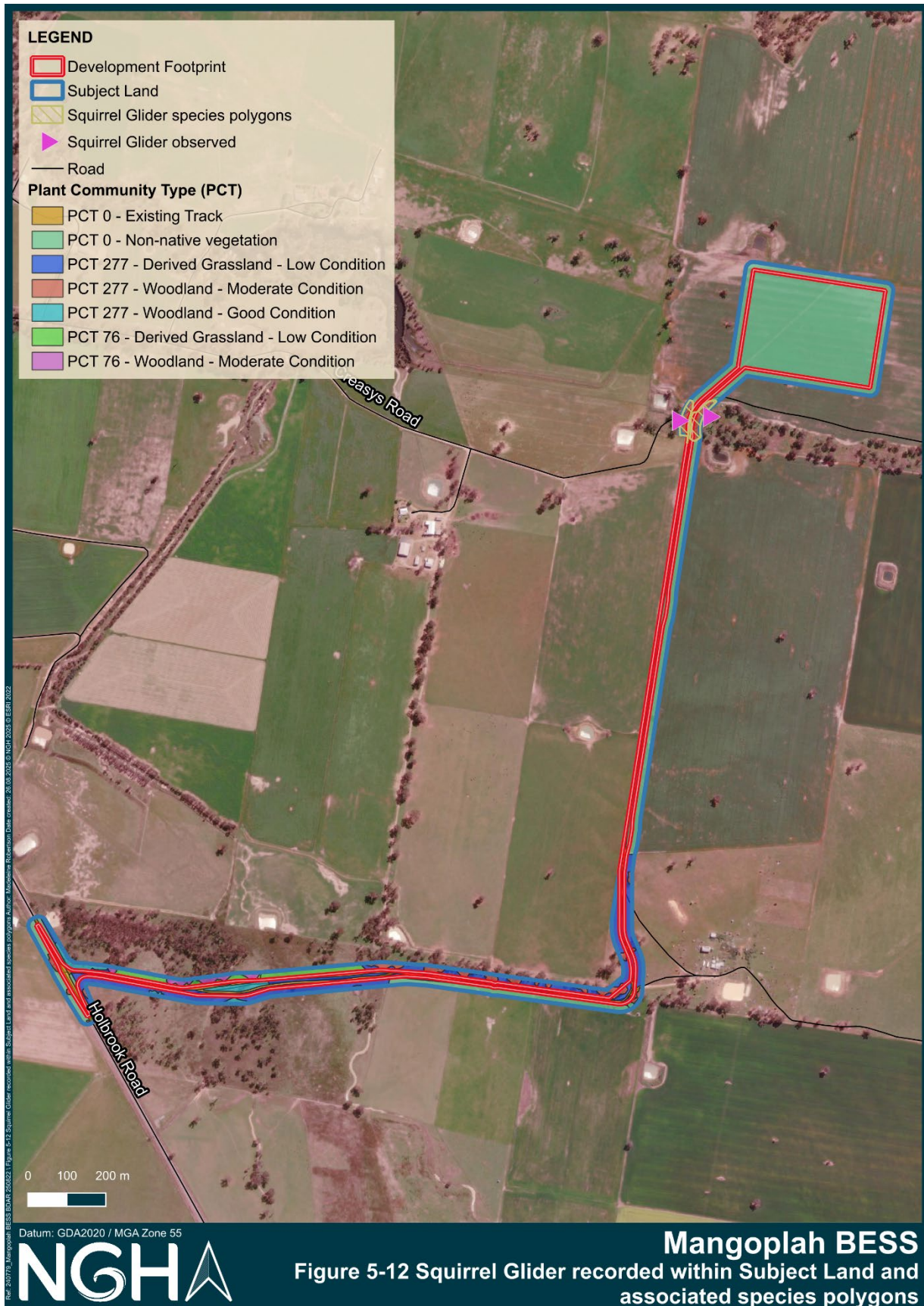


Figure 5-21 Squirrel Glider recorded within the Subject Land and associated species polygons (NGH, 2025)

Table 5-8 Results for present species (recorded within the Subject Land)

Common name	Scientific name	Biodiversity risk weighting (BAM-C & TBDC*)	SAIL entity** (BAM-C & TBDC)	Habitat constraints / microhabitats present on the Subject Land / vegetation zone	Abundance – No. individual plants present on Subject Land (flora with unit of measure of count)	Extent (ha) of suitable habitat present on Development Footprint	TBDC species specific recommendations e.g. buffers, general comments (where relevant)	Habitat condition (vegetation integrity score for each vegetation zone in the polygon – area species only)
FLORA								
A Spear-grass	<i>Austrostipa wakoolica</i>	High (2)	No	Associated PCTs and preferred soil type	N/A	2.00	None	VZ1 High 54.6 VZ2 Moderate 39.0 VZ3 Low 35.2 VZ4 Low 28.3
Euphrasia arguta	<i>Euphrasia arguta</i>	Very High (3)	Yes	Associated PCTs and preferred soil type	N/A	2.00	None	VZ1 High 54.6 VZ2 Moderate 39.0 VZ3 Low 35.2 VZ4 Low 28.3
Yass Daisy	<i>Ammobium</i>	High (2)	No	Preferred soil	40 (assumed)	2.00	None	N/A

Common name	Scientific name	Biodiversity risk weighting (BAM-C & TBDC*)	SAIL entity** (BAM-C & TBDC)	Habitat constraints / microhabitats present on the Subject Land / vegetation zone	Abundance – No. individual plants present on Subject Land (flora with unit of measure of count)	Extent (ha) of suitable habitat present on Development Footprint	TBDC species specific recommendations e.g. buffers, general comments (where relevant)	Habitat condition (vegetation integrity score for each vegetation zone in the polygon – area species only)
	<i>craspedioides</i>			type	present)			
FAUNA								
Barking Owl	<i>Ninox connivens</i>	High (2)	No	HBTs with suitable hollows	N/A	0.23	800 m from the location of the detected owl, and containing a living or dead tree with a hollow >20 cm diameter that occurs >4 m above the ground	VZ1 High 54.6 VZ2 Moderate 39.0
Golden Sun Moth	<i>Synemon plana</i>	Moderate (1.5)	No	Grasslands and woodlands of associated PCTs	N/A	2.00	200 m buffer applied to suitable habitat	VZ1 High 54.6 VZ2 Moderate 39.0 VZ3 Low 35.2

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Common name	Scientific name	Biodiversity risk weighting (BAM-C & TBDC*)	SAIL entity** (BAM-C & TBDC)	Habitat constraints / microhabitats present on the Subject Land / vegetation zone	Abundance – No. individual plants present on Subject Land (flora with unit of measure of count)	Extent (ha) of suitable habitat present on Development Footprint	TBDC species specific recommendations e.g. buffers, general comments (where relevant)	Habitat condition (vegetation integrity score for each vegetation zone in the polygon – area species only)
								VZ4 Low 28.3
Masked Owl	<i>Tyto novaehollandiae</i>	High (2)	No	HBTs with suitable hollows	N/A	0.23	800 m buffer from the location of the detected owl, and containing a living or dead tree with a hollow >20 cm diameter that occurs >4 m above the ground	VZ1 High 54.6 VZ2 Moderate 39.0
Pink-tailed Legless Lizard	<i>Aprasia parapulchella</i>	High (2)	No	Grasslands and woodlands of associated PCTs	N/A	2.00	None	VZ1 High 54.6 VZ2 Moderate 39.0 VZ3 Low 35.2 VZ4 Low 28.3

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Common name	Scientific name	Biodiversity risk weighting (BAM-C & TBDC*)	SAIL entity** (BAM-C & TBDC)	Habitat constraints / microhabitats present on the Subject Land / vegetation zone	Abundance – No. individual plants present on Subject Land (flora with unit of measure of count)	Extent (ha) of suitable habitat present on Development Footprint	TBDC species specific recommendations e.g. buffers, general comments (where relevant)	Habitat condition (vegetation integrity score for each vegetation zone in the polygon – area species only)
Southern Myotis	<i>Myotis macropus</i>	High (2)	No	Waterbodies (dams) greater than 3 m in width	N/A	1.00	200 m buffer on habitat constraints including associated PCTs	VZ1 High 54.6 VZ2 Moderate 39.0 VZ4 Low 28.3
Squirrel Glider	<i>Petaurus norfolcensis</i>	High (2)	No	Woodland where trees are less than 50 m in proximity	N/A	0.05	None	VZ1 High 54.6
Squirrel Glider in the Wagga Wagga Local Government Area	<i>Petaurus norfolcensis</i> – <i>endangered population</i>	High (2)	No	Woodland where trees are less than 50 m in proximity	N/A	0.05	None	VZ1 High 54.6
Striped Legless	<i>Delma impar</i>	Moderate (1.5)	No	Grasslands and woodlands of	N/A	2.00	None	VZ1 High 54.6

Common name	Scientific name	Biodiversity risk weighting (BAM-C & TBDC*)	SAIL entity** (BAM-C & TBDC)	Habitat constraints / microhabitats present on the Subject Land / vegetation zone	Abundance – No. individual plants present on Subject Land (flora with unit of measure of count)	Extent (ha) of suitable habitat present on Development Footprint	TBDC species specific recommendations e.g. buffers, general comments (where relevant)	Habitat condition (vegetation integrity score for each vegetation zone in the polygon – area species only)
Lizard				associated PCTs				VZ2 Moderate 39.0 VZ3 Low 35.2 VZ4 Low 28.3

5.6. Threatened species listed under the EPBC Act

The species detailed in Table 5-9 are listed under the EPBC Act.

Table 5-9 Results for EPBC Act listed species present or assumed present

Common name	Scientific name	Abundance	Extent (ha) of suitable habitat present in Development Footprint
Flora			
A Spear-grass	<i>Austrostipa wakoolica</i>	Unknown (assumed presence)	2.00

Common name	Scientific name	Abundance	Extent (ha) of suitable habitat present in Development Footprint
Euphrasia arguta	<i>Euphrasia arguta</i>	Unknown (assumed presence)	2.00
Yass Daisy	<i>Ammobium craspedioides</i>	Unknown (assumed presence)	2.00
Fauna			
Brown Treecreeper (eastern subspecies)	<i>Climacteris picumnus victoriae</i>	Unknown (Ecosystem species)	0.34
Corben's Long-Eared Bat	<i>Nyctophilus corbeni</i>	Present – recorded on ANABAT	0.34
Diamond Firetail	<i>Stagonopleura guttata</i>	Unknown (Ecosystem species)	2.00
Fork-tailed Swift	<i>Apus pacificus</i>	Unknown (Migratory species)	0.34
Golden Sun Moth	<i>Synemon plana</i>	Unknown (assumed presence)	2.00
Regent Honeyeater	<i>Anthochaera phrygia</i>	Unknown (Ecosystem species)	0.34
South-eastern Hooded Robin	<i>Melanodryas cucullata cucullata</i>	Unknown (Ecosystem species)	2.00
Southern Whiteface	<i>Aphelocephala leucopsis</i>	Unknown (Ecosystem species)	2.00
Striped Legless Lizard	<i>Delma impar</i>	Unknown (assumed presence)	2.00
Swift Parrot	<i>Lathamus discolor</i>	Unknown (Ecosystem species)	0.34

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Common name	Scientific name	Abundance	Extent (ha) of suitable habitat present in Development Footprint
White-throated Needletail	<i>Hirundapus caudacutus</i>	Unknown (Ecosystem species)	0.34
Yellow Wagtail	<i>Motacilla flava</i>	Unknown (Migratory species)	2.00

5.7. Further survey recommendations

Five candidate species credit species were unable to be surveyed during the correct survey period and have been assumed as present within the Subject Land. Targeted surveys or expert report for the species described in Table 5-10 are recommended and will be undertaken during the required survey period in the response to submission phase following BDAR lodgement. In the interim, presence has been assumed until these surveys take place.

Table 5-10 Threatened species requiring targeted surveys and their survey periods

Scientific Name Common Name	Survey period
Flora	
<i>Ammobium craspedioides</i> Yass Daisy	September – November
<i>Austrostipa wakoolica</i> A Spear-grass	October – December
<i>Euphrasia arguta</i> Euphrasia arguta	November – March
Fauna	
<i>Delma impar</i> Striped Legless Lizard	Expert Report being prepared
<i>Synemon plana</i> Golden Sun Moth	Expert Report being prepared

6. Identifying prescribed biodiversity impacts

Prescribed impacts to biodiversity factors have been identified and are detailed in Table 6-1 below. Impacts to threatened species and entities within the Subject Land are detailed in Table 6-1 below and locations are shown in Figure 6-1.

Table 6-1 Prescribed impacts identified

Prescribed impact	Present	Description of feature characteristics and location	Threatened entities that use, are likely to use, or are part of the habitat feature.	Habitat importance to threatened entities
Karst, caves, crevices, cliffs, rocks or other geological features of significance	☐ Yes / ☒ No	No karsts, caves, cliffs, rocks or other geological features of significance occur inside the Subject Land.	N/A	N/A
Human-made structures	☒ Yes / ☐ No	Human-made structures were located inside the Subject Land as stock yards for agricultural purposes. Three small culverts were also observed within the Subject Land, underneath the existing access track in the western section. Following a site investigation and analysis, it was concluded	Species detected within Subject Land: • Corben's Long-eared Bat (<i>Nyctophilus corbeni</i>) • Large Bent-winged Bat (<i>Miniopterus morphnoides</i>) • Southern Myotis (<i>Myotis macropus</i>) • Yellow-bellied Sheathtail-bat (<i>Saccolaimus flaviventris</i>)	Culverts provide habitat for bats to roost, as they often roost along waterways. Although no roosts were detected, culverts inside the Subject Land may provide rest and shelter for the threatened bats detected or assumed present.

Prescribed impact	Present	Description of feature characteristics and location	Threatened entities that use, are likely to use, or are part of the habitat feature.	Habitat importance to threatened entities
		that the stock yards are unlikely to support any threatened species because they do not provide suitable habitat or potential suitable habitat. The culverts may provide habitat for threatened bats however these were inspected and no evidence of roosts or use was detected.		
Non-native vegetation	☒ Yes / ☐ No	There is 18.95 ha of non-native vegetation within the Subject Land as cropped land and existing road/access track. Following field surveys, it was concluded that non-native vegetation did not provide important habitat for any threatened species due to exotic dominated and agriculturally disturbed grassland, and access track/roads that are currently in use.	Species detected within Subject Land: - Barking Owl (<i>Ninox connivens</i>) - Masked Owl (<i>Tyto novaehollandiae</i>). Species assumed present based on suitable habitat of cropped land: - Black Falcon (<i>Falco subniger</i>) - Diamond Firetail (<i>Stagnopleura guttata</i>) - Flame Robin (<i>Petroica phoenicea</i>) - Fork-tailed Swift (<i>Apus pacificus</i>) - Scarlet Robin (<i>Petroica boodang</i>) - Spotted Harrier (<i>Circus assimilis</i>) - Turquoise Parrot (<i>Neophema pulchella</i>) - White-throated Needletail (<i>Hirundapus caudacutus</i>) - Striped Legless Lizard (<i>Delma impar</i>)	Bird species may utilise non-native vegetation for foraging or nesting. The Golden Sun Moth may utilise non-native vegetation including grassland as habitat, although native vegetation is its preferred habitat.

Prescribed impact	Present	Description of feature characteristics and location	Threatened entities that use, are likely to use, or are part of the habitat feature.	Habitat importance to threatened entities
			Golden Sun Moth (<i>Synemon plana</i>)	
Habitat connectivity	☒ Yes / ☐ No	Box-Gum Woodland provides habitat connectivity within the Subject Land. Woodland connectivity is limited as a result of clearing leading to fragmentation. The northern patch of woodland provides habitat connectivity to Burkes Creek, and the southern section provides limited habitat connectivity along Paper Forest Creek.	Species detected within Subject Land: - Barking Owl (<i>Ninox connivens</i>) - Corben's Long-eared Bat (<i>Nyctophilus corbeni</i>) - Large Bent-winged Bat (<i>Miniopterus morphnoides</i>) - Masked Owl (<i>Tyto novaehollandiae</i>) - Southern Myotis (<i>Myotis macropus</i>) - Squirrel Glider (<i>Petaurus norfolcensis</i>) - Yellow-bellied Sheathtail-bat (<i>Saccolaimus flaviventris</i>). TECs detected within Subject Land: - Box-Gum Woodland - Inland Grey Box Woodland. Species assumed present based on suitable habitat and associated PCTs: - A Spear-grass (<i>Austrostipa wakoolica</i>) - Black Falcon (<i>Falco subniger</i>) - Black-chinned Honeyeater (eastern subspecies) (<i>Melithreptus gularis gularis</i>) - Brown Treecreeper (eastern subspecies) (<i>Climacteris picumnus victoriae</i>) - Diamond Firetail (<i>Stagnopleura guttata</i>) - Dusky Woodswallow (<i>Artamus cyanopterus cyanopterus</i>) - Euphrasia arguta (<i>Euphrasia arguta</i>) - Flame Robin (<i>Petroica phoenicea</i>)	Woodland habitat and scattered trees provide habitat connectivity for bird species moving across landscapes. Woodland also provides habitat for bats, insects and arboreal mammals. Grassland habitat provides connectivity for ground-foraging bird species, reptiles and amphibians. Woodland and grassland habitat provides opportunity for TECs and flora species to survive and regenerate.

Prescribed impact	Present	Description of feature characteristics and location	Threatened entities that use, are likely to use, or are part of the habitat feature.	Habitat importance to threatened entities
			- Fork-tailed Swift (<i>Apus pacificus</i>) - Golden Sun Moth (<i>Synemon plana</i>) - Grey-crowned Babbler (eastern subspecies) (<i>Pomatostomus temporalis temporalis</i>) - Little Lorikeet (<i>Glossopsitta pusilla</i>) - Painted Honeyeater (<i>Grantiella picta</i>) - Regent Honeyeater (<i>Anthochaera phrygia</i>) - Scarlet Robin (<i>Petroica boodang</i>) - South-eastern Hooded Robin (<i>Melanodryas cucullata cucullata</i>) - Southern Whiteface (<i>Aphelocephala leucopsis</i>) - Speckled Warbler (<i>Chthonicola sagittata</i>) - Spotted Harrier (<i>Circus assimilis</i>) - Striped Legless Lizard (<i>Delma impar</i>) - Swift Parrot (<i>Lathamus discolor</i>) - Turquoise Parrot (<i>Neophema pulchella</i>) - Varied Sittella (<i>Daphoenositta chrysoptera</i>) - Yass Daisy (<i>Ammobium craspedioides</i>) - White-throated Needletail (<i>Hirundapus caudacutus</i>).	
Waterbodies, water quality and hydrological processes	☒ Yes / ☐ No	Multiple ephemeral streams occur through the Subject Land including 1 st , 2 nd and 4 th Strahler Order streams; however, it is likely that surface water flow only would be present during periods of heavy rainfall. Paper Forest	Species detected within Subject Land: - Corben's Long-eared Bat (<i>Nyctophilus corbeni</i>) - Large Bent-winged Bat (<i>Miniopterus morphnoides</i>) - Southern Myotis (<i>Myotis macropus</i>) - Yellow-bellied Sheathtail-bat (<i>Saccolaimus flaviventris</i>). Ecosystem species assumed present based on suitable	Dams and creeks provide a water source for bat species detected within the Subject Land. Dams and creeks could also provide a water source as habitat for bird species

Prescribed impact	Present	Description of feature characteristics and location	Threatened entities that use, are likely to use, or are part of the habitat feature.	Habitat importance to threatened entities
		Creek is the only named waterway within the Subject Land. It is a 5th Strahler Order stream, which crosses the access road corridor through Lot 228 DP754557. It is also mapped as Key Fish Habitat (KFH) under the NSW <i>Fisheries Management Act 1994</i> (FM Act). Waterbodies include eight dams within 50-150 m of the Subject Land boundary. Six of these were inspected and only five contained water. No dams occur within the Subject Land or Development Footprint. Waterbodies can be seen in Figure 3-4.	habitat and associated PCTs: - Fork-tailed Swift (<i>Apus pacificus</i>) - White-throated Needletail (<i>Hirundapus caudacutus</i>).	reliant on water. Sloane's Froglet is reliant on waterbodies and aquatic vegetation as habitat.
Wind turbine strikes (wind farm development only)	☐ Yes / ☒ No	No wind turbines proposed within Subject Land.	N/A	N/A
Vehicle strikes	☒ Yes /	The proposed activity will cause an increase in traffic	Species detected within Subject Land:	Increased vehicle traffic during construction could

Prescribed impact	Present	Description of feature characteristics and location	Threatened entities that use, are likely to use, or are part of the habitat feature.	Habitat importance to threatened entities
	☐ No	movements, during the assessment and construction phase of the project.	- Squirrel Glider (<i>Petaurus norfolcensis</i>). Species assumed present based on suitable habitat and associated PCTs: - Black-chinned Honeyeater (eastern subspecies) (<i>Melithreptus gularis gularis</i>) - Brown Treecreeper (eastern subspecies) (<i>Climacteris picumnus victoriae</i>) - Diamond Firetail (<i>Stagnopleura guttata</i>) - Dusky Woodswallow (<i>Artamus cyanopterus cyanopterus</i>) - Flame Robin (<i>Petroica phoenicea</i>) - Golden Sun Moth (<i>Synemon plana</i>) - Grey-crowned Babbler (eastern subspecies) (<i>Pomatostomus temporalis temporalis</i>) - Little Lorikeet (<i>Glossopsitta pusilla</i>) - Scarlet Robin (<i>Petroica boodang</i>) - South-eastern Hooded Robin (<i>Melanodryas cucullata cucullata</i>) - Speckled Warbler (<i>Chthonicola sagittata</i>) - Spotted-tailed Quoll (<i>Dasyurus maculatus</i>) - Striped Legless Lizard (<i>Delma impar</i>) - Swift Parrot (<i>Lathamus discolor</i>) - Turquoise Parrot (<i>Neophema pulchella</i>) - Varied Sittella (<i>Daphoenositta chrysoptera</i>).	increase the chance of vehicle strikes within the Subject Land, however aerial species such as migratory species are at less risk of vehicle strike than other generalist birds or ground-dwelling species. The Squirrel Glider has been observed to utilise woodland in the northern section of the Subject Land and would likely utilise the surrounding woodland patch to leap from tree to tree. The Spotted-tailed Quoll may use wooded areas containing logs and hollows to traverse across gaps in the landscape.

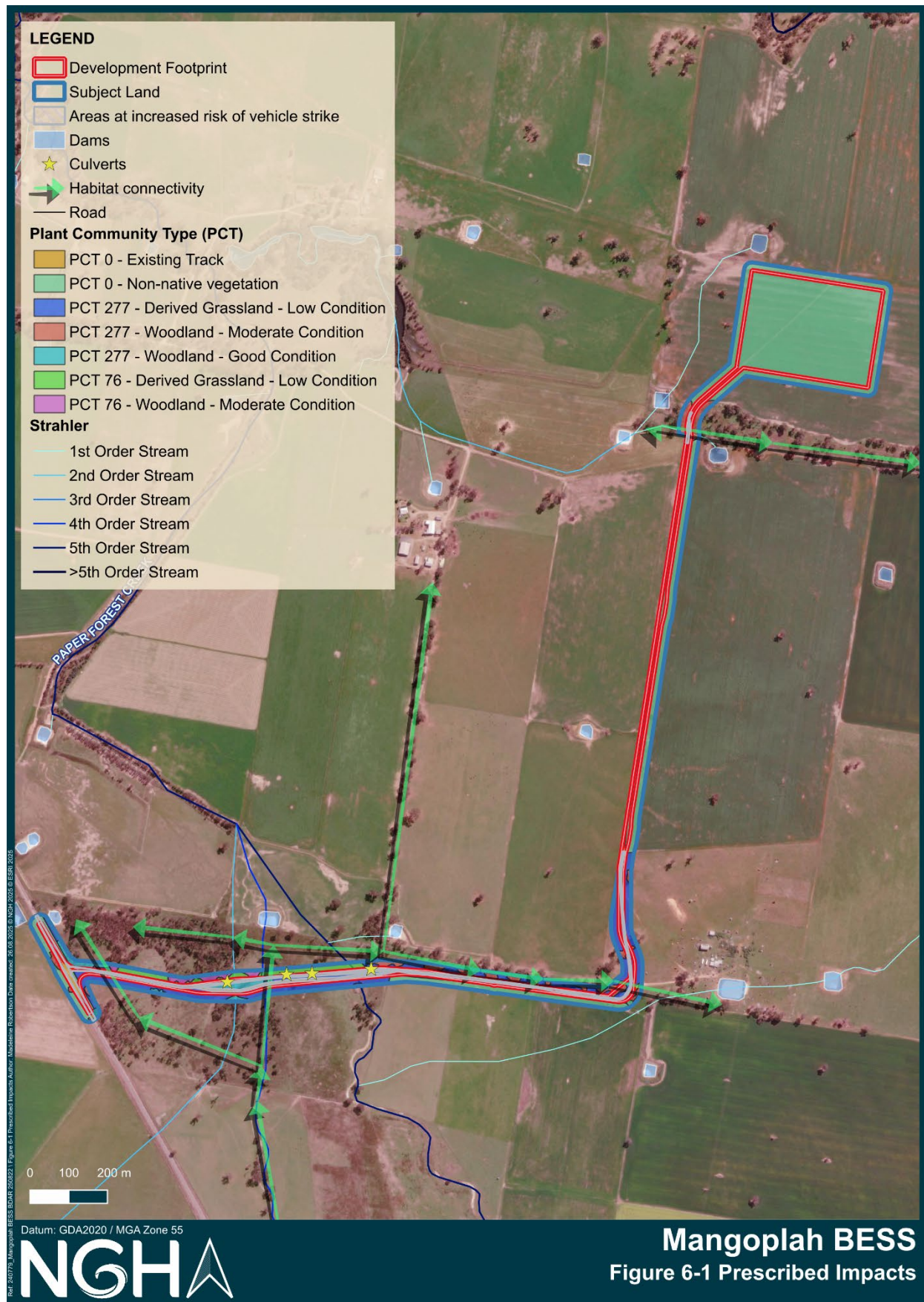


Figure 6-1 Areas of Prescribed impacts (NGH, 2025)

Stage 2: Impact assessment (biodiversity values and prescribed impacts)

7. Avoid and minimise impacts

7.1. Avoiding and minimising direct/indirect impacts on project location and design)

The design of the proposal is the result of an iterative process. The design has been adapted progressively as information regarding site constraints, potential impacts, and risks associated with the proposal have become available.

The proposed Development Footprint layout has been located and designed to avoid and minimise impacts to native vegetation and biodiversity values as much as possible.

7.1.1. Initial project location and design

Samsung Pty Ltd reviewed and considered an alternative site within the Greater Hume LGA. However, the Mangoplah BESS site was chosen as the site provides an optimal combination of:

- Extremely low potential impacts to biodiversity.
- Sufficient levels of available capacity on the grid distribution system.
- Proximity to a grid connection
- Suitable planning context
- Excellent road access
- Minimal sensitive receivers within two kilometres of the Project Site.
- Low land use conflict.

The Project site was selected with the goal of balancing social, environmental and economic aspects associated with a BESS development. The Project site was also selected due to the generally low ecological value across the Development Footprint, with the BESS site dominated by exotic vegetation as a result of cropping, grazing and associated agricultural activities. Topography was an additional factor in site selection, with an elevation of 275 m above sea level (ASL) and flat throughout the Subject Land. Furthermore, the site was selected due to the presence of an existing transmission line.

The initial location and design included the establishment of the site access and associated road treatments required to facilitate the traffic movements for the construction phase. The initial scoping report details that the access treatments would be covered in the EIS and that access would likely be via the existing private access track from Holbrook Road, which is currently used for agricultural purposes (NGH Pty Ltd, 2024). Consideration was given to accessing the site from Paper Forest Road and travelling north on an unnamed, unsealed road. However, this was deemed unsuitable as it passes a number of non-associated receiver dwellings and requires a further distance of travel through roadside vegetation.

The Development Footprint in the initial project location and design was approximately 13.1 ha, with the indicative investigation area for the BESS site and related substation occupying approximately 10.4 ha of the total 13.1 ha. The initial scoping included investigations in the entire Lot up to Burkes Creek. The BESS site was moved further south, away from Burkes Creek to avoid impacts to riparian vegetation and waterways. The BESS site was also located to avoid any direct impacts to remnant paddock trees. The initial

Development Footprint avoided woodland in the eastern corner of the access road, using the existing access track as an indicative footprint.

The initial footprint was found to be impacting native vegetation including PCT 277 in the form of woodland and low condition derived grassland. Impacts to biodiversity values in the initial project location and design included HBTs, KFH, Biodiverse riparian land and potential habitat for threatened species (NGH Pty Ltd, 2024). The initial design was constructed to avoid as much native vegetation as possible, and ensure little to no impacts on threatened species, threatened species' habitat or TECs. Refer to Figure 7-1 for EPBC Act-listed TECs to be removed or retained. Refer to Figure 7-2, Figure 7-3 and Figure 7-4 for BC Act-listed TECs to be removed or retained.

7.1.2. Access track extension

The existing access track was selected for use, to avoid additional clearing to create a new track. The first modification to the Development Footprint was made to enable construction vehicles and equipment to be transported to and from the BESS site. This included widening multiple sections of the existing access track – in particular the eastern corner that leads north to the BESS site, and in the middle of the track from the west to the east. Widening was avoided in the initial design, but traffic impact studies required minor widening for safety and visibility. Passing bays were selected in areas with no trees in order to avoid clearing of additional trees. A small area at the entrance to the access track will also require extension for vehicles to safely enter the site. Updates to the Development Footprint resulted in:

- Avoidance of 171.52 ha of native vegetation within a 1500 m radius of the Project.
- Avoidance of 20 HBTs
- Avoidance of 7.14 ha of EPBC Act *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland*.
- Avoidance of 0.32 ha of EPBC Act *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia*.

With consideration of the current land use, vegetation condition, avoidance areas and proposed mitigation measures, the access track extension is considered minimal impact on the local biodiversity.

7.1.3. Site access upgrade

Following the access track extension, an additional modification was made to the entry/exit point off the Project location off Holbrook Road. This updated design includes an extension to the road upgrades proposed on Holbrook Road at the entrance point, at the western section of the Development Footprint. This modification was proposed to enable construction vehicles to safely manoeuvre into and out of the Project. As a result, the change in direct impacts to native vegetation is extremely minor.

In summary, the Mangoplah BESS avoids and minimises impacts to biodiversity. Impacts are avoided to biodiversity through:

- Use of existing access track
- Selection of wholly exotic BESS site
- Retaining 20 HBTs within the Subject Land.

Impacts are minimised through:

- Utilising areas of poorer condition native vegetation where possible.
- Mitigation measures to reduce residual risks to biodiversity.
- Overall site selection.

7.2. Avoid and minimise prescribed impacts

7.2.1. Initial project location and design

In addition to the avoided impacts described in section 7.1, key considerations in the location and design included the aim to utilise an area that has previously been cleared, particularly for agricultural use. This reduced the need for potential removal of habitat and native vegetation, therefore minimising impacts on habitat connectivity within the Mangoplah area. This considered that the Development Footprint is primarily made up of an existing access track and exotic vegetation.

Furthermore, the project design avoids impacts to farm dams, and minimise impacts to Paper Forest Creek. These measures were implemented to minimise the overall impacts to biodiversity across the Development Footprint.

7.2.2. Access track extension

The access track extension resulted in an increase of impacts to native vegetation, HBTs, TECs and threatened species' habitat. Although habitat connectivity would decrease slightly as a result of the Project, the avoided areas including retained vegetation are significantly larger and are of higher quality than the vegetation to be removed. Implementation of mitigation measures are likely to minimise prescribed impacts to threatened fauna species that occur or may occur within the Subject Land.

7.2.3. Road upgrade

The road upgrade extension may result in an increase in impacts to prescribed impacts including noise pollution. Implementation of mitigation measures are likely to minimise prescribed impacts to threatened fauna species that occur or may occur within the Subject Land.

7.3. Other measures considered

The consideration for locating the BESS in a cropped paddock was also due to the absence of trees and a flat landscape, reducing native vegetation impacts and minimising potential damage to the BESS from falling trees. An alternative access track was considered, but was dismissed due to its proximity to residences.

7.4. Summary of measures to avoid and minimise impacts

A summary of mitigation and avoidance measures and associated timelines and responsibilities for these measures have been detailed in Table 7-1 below.

Table 7-1 Avoidance and minimisation measures for direct, indirect and prescribed impacts

Action	Outcome	Timing	Responsibility
BESS Site selection in wholly exotic pasture	Reduced disturbance to natural ecosystems by choosing a location in previously grazed, pasture-improved areas, limiting impacts on native vegetation and wildlife habitat. BESS site was located to avoid impacts to paddock trees. BESS site was also located the furthest distance possible from Burkes Creek, in the exotic paddock to minimise any indirect impacts on the waterbody and riparian woodland habitat.	Ongoing	Samsung
Utilisation of existing access track	Avoided the need to construct a new road, thereby minimising additional habitat disturbance, protecting vegetation, and maintaining habitat connectivity.	Ongoing	Samsung
Placement of BESS on flat landscape	Stability of infrastructure with a reduced risk damage due to fallen trees and/or tree limbs.	Ongoing	Samsung
Proximity to transmission line	Minimised need for new infrastructure, which reduced potential biodiversity impacts associated with creating new transmission lines and infrastructure corridors.	Ongoing	Samsung
Minimising access track extension and widening to minimum extent needed for safe passage.	Minimises further loss to EPBC Act-listed and BC Act-listed entities including TECs and threatened species' habitat, including avoidance of impacts to 20 HBTs. Avoids direct impacts to dams and minimises impacts to Key Fish Habitat as threatened species' habitat.	Ongoing	Samsung

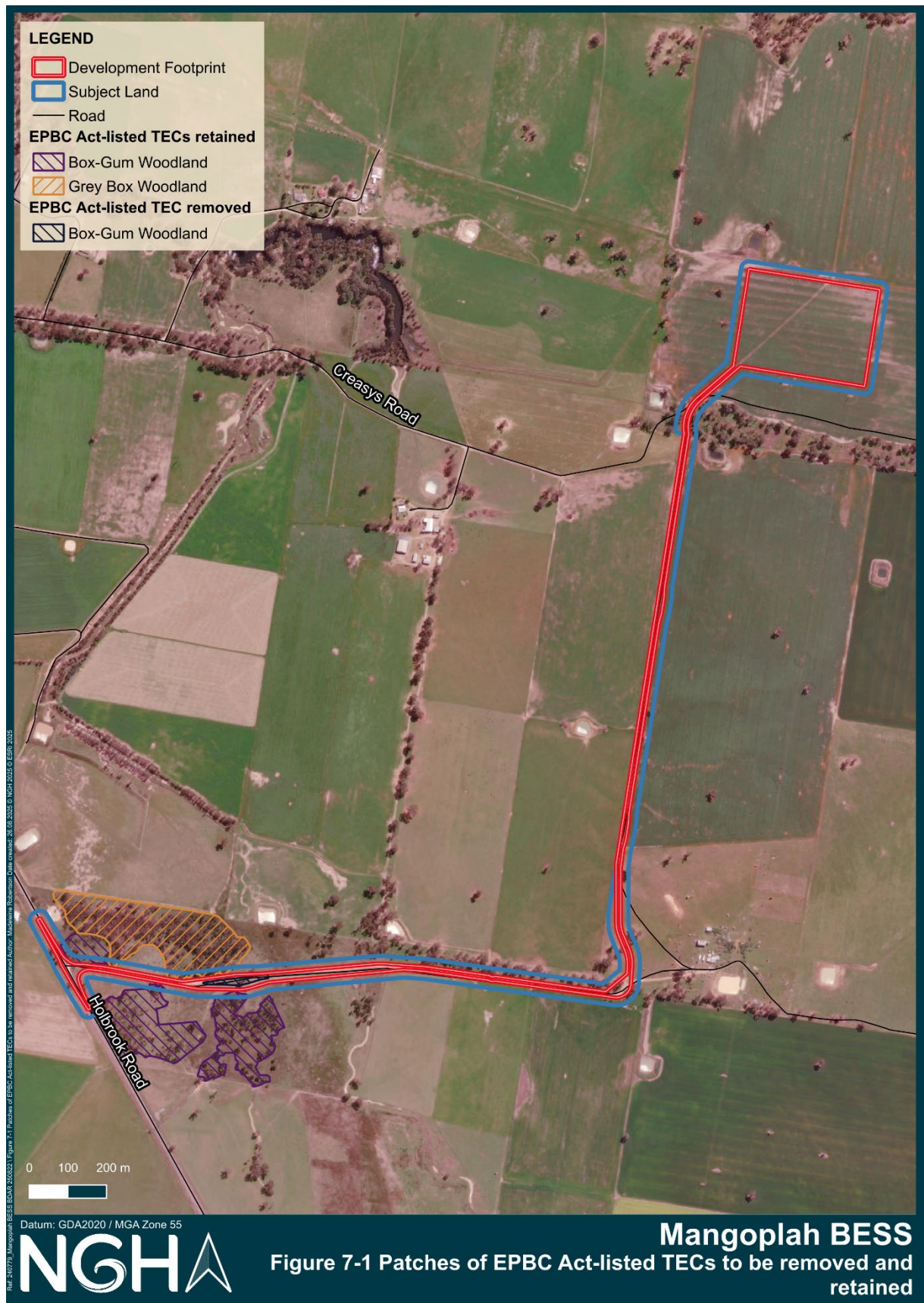


Figure 7-1 Patches of EPBC Act-listed TECs to be removed and retained (NGH, 2025)

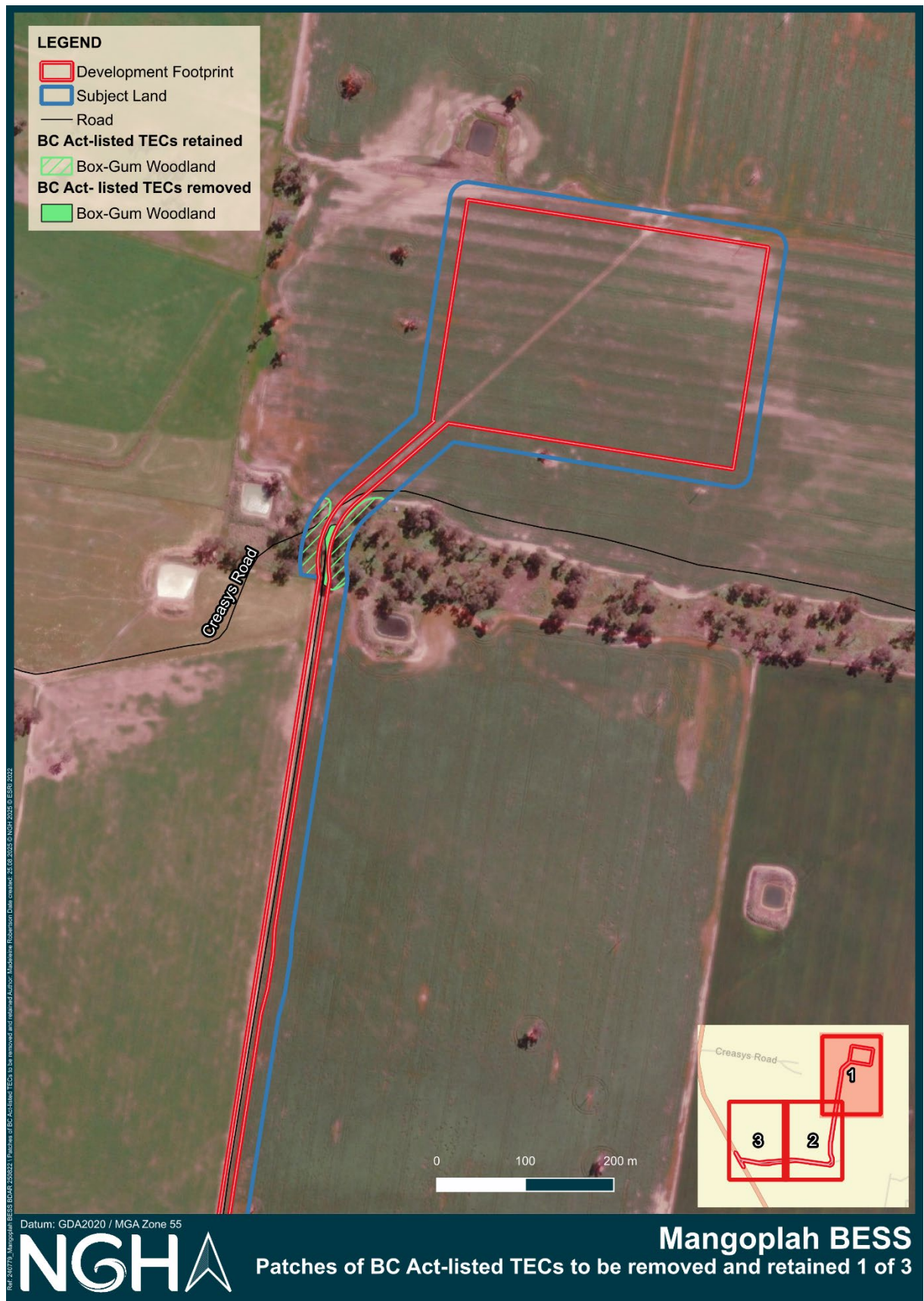


Figure 7-2 Patches of BC Act-listed TECs to be removed and retained - Map 1 of 3 (NGH, 2025)

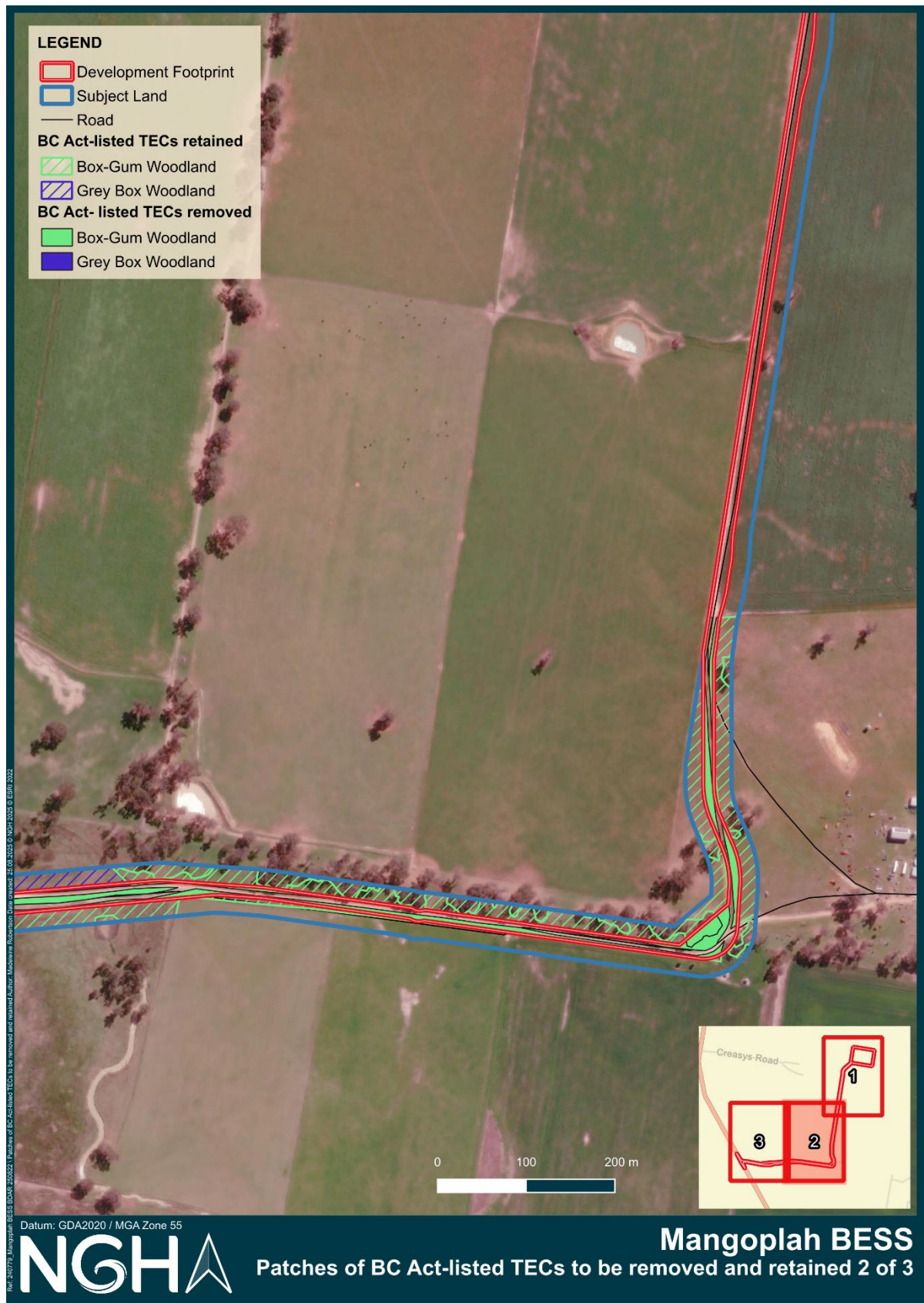


Figure 7-3 Patches of BC Act-listed TECs to be removed and retained - Map 2 of 3 (NGH, 2025)

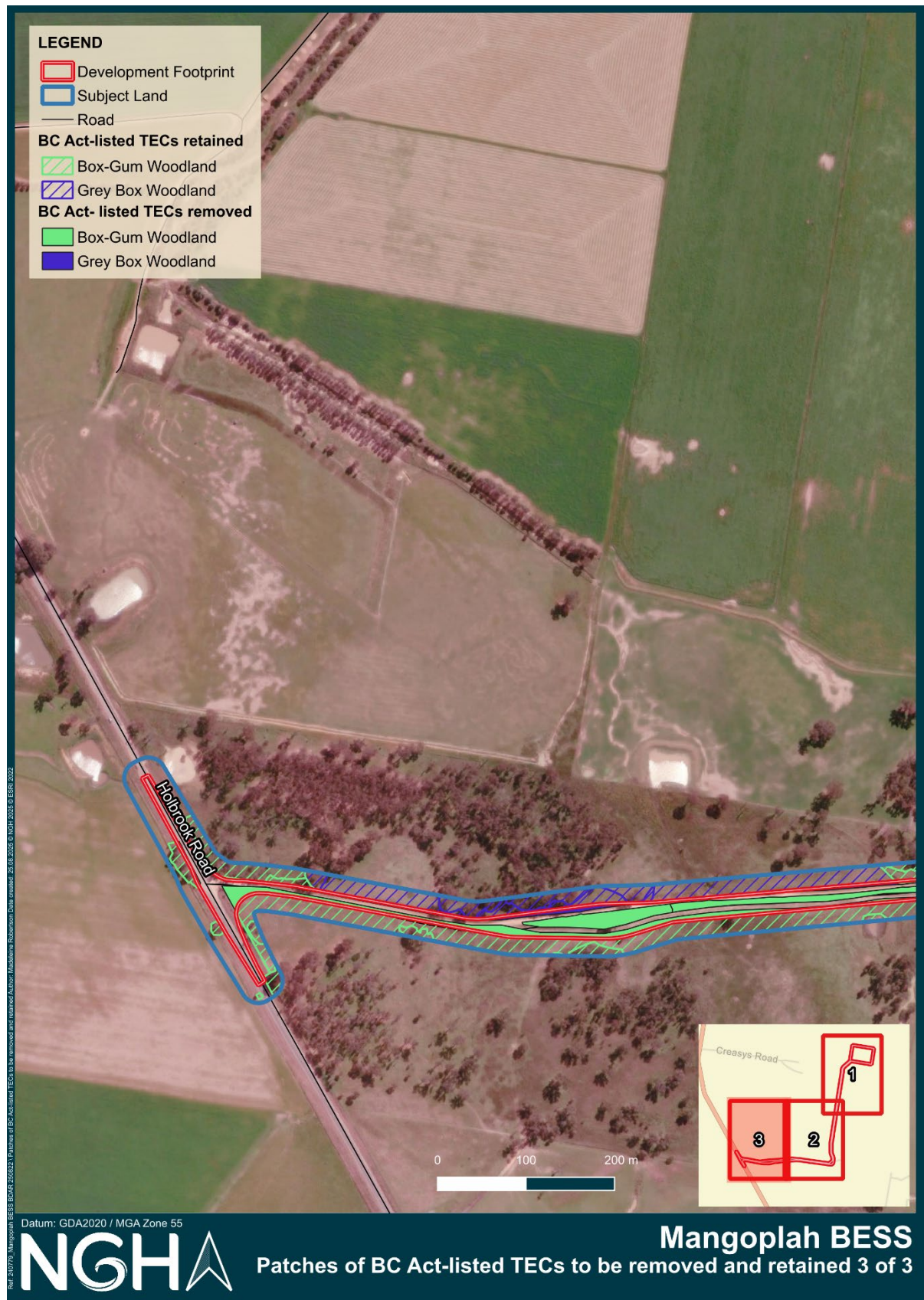


Figure 7-4 Patches of BC Act-listed TECs to be removed and retained - Map 3 of 3 (NGH, 2025)

8. Impact assessment

Assumptions

The following assumptions underpin this impact assessment:

- All activities associated within the development would be contained wholly within the Development Footprint, including stockpiles, machinery manoeuvring, access tracks and infrastructure.
- Vegetation integrity within the Development Footprint would be reduced to zero and complete vegetation clearing is assumed.

8.1. Direct impacts

8.1.1. Residual direct impacts

The construction and operational phases of the proposal have the potential to impact biodiversity values at the site that cannot be avoided via impact minimisation and avoidance measures. This would occur through residual direct impacts, such as habitat clearance (and associated noise and disturbance) and ongoing existence of infrastructure (which may create barriers to movement and generate noise and disturbance). These are summarised in Table 8-1.

Table 8-1 Residual direct impacts to biodiversity during the construction and operational phases

Describe impact	BC Act status	EPBC Act Status	SAIL entity	Project phase/timing of impact	Extent (ha, number of individuals)
Clearing for construction: reduction in community extent and integrity					
<i>White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland</i>	Not Listed	CE	N/A	Construction	0.22 ha
<i>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</i>	CE	Not Listed	Yes	Construction	1.85 ha
<i>Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions</i>	E	Not Listed	No	Construction	0.15 ha derived grassland
Native vegetation (all zones) and ecosystem credit species	N/A	N/A	N/A	Construction	2.00 ha
Non-native vegetation	N/A	N/A	N/A	Construction	9.97 ha
Clearing for construction: habitat loss, trampling, loss of individuals					

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Describe impact	BC Act status	EPBC Act Status	SAll entity	Project phase/timing of impact	Extent (ha, number of individuals)
Flora					
<i>Ammobium craspedioides</i> Yass Daisy	V	V	No	Construction	40 individuals (assumed present)
<i>Austrostipa wakoolica</i> A Speargrass	E	E	No	Construction	2.00 ha (assumed present)
<i>Euphrasia arguta</i> Euphrasia arguta	CE	CE	Yes	Construction	2.00 ha (assumed present)
Fauna					
<i>Delma impar</i> Striped Legless Lizard	V	V	No	Construction	2.00 ha (assumed present)
<i>Myotis macropus</i> Southern Myotis	V	Not Listed	No	Construction	1.00 ha
<i>Ninox connivens</i> Barking Owl	V	Not Listed	No	Construction	0.23 ha
<i>Petaurus norfolcensis</i> Squirrel Glider	V	Not Listed	No	Construction	0.05 ha
<i>Petaurus norfolcensis</i> – endangered population Squirrel Glider in the Wagga Wagga Local Government Area	Endangered Population	Not Listed	No	Construction	0.05 ha
<i>Synemon plana</i> Golden Sun Moth	V	V	No	Construction	2.00 ha (assumed present)
<i>Tyto novaehollandiae</i> Masked Owl	V	Not Listed	No	Construction	0.23 ha
Habitat loss (including HBT, fallen timber); displacement of resident fauna, injury or death of fauna					
Hollow-Bearing Trees	N/A	N/A	N/A	Construction	5 HBTs

8.1.2. Changes in vegetation integrity scores

The proposed clearing will reduce the VI scores in four zones to zero, as shown in Table 8-2.

Table 8-2 Change in VI Score for each vegetation zone as a result of identified impacts

Vegetation Zone	PCT ID/Zone	Area (ha)	Before development				After development				Change
			Composition	Structure	Function	VI score	Composition	Structure	Function	VI score	Change in VI score
1	277 High	0.22	49.5	86	38.2	54.6	0	0	0	0	-54.6
2	277 Moderate	0.11	23.9	43.1	57.6	39	0	0	0	0	-37
3	277 Low	1.52	54.1	55.3	14.6	35.2	0	0	0	0	-35.2
4	76 Low	0.15	47.6	37.9	12.6	28.3	0	0	0	0	-28.3

8.1.3. Loss of hollow-bearing trees

Across the Subject Land, 25 HBTs were recorded. Of the total 25 HBTs in the Subject Land, five would be removed from the Development Footprint including:

- Four within Zone 2
- One within Zone 1.

HBT clearing has been avoided as much as possible and mitigation measures have been implemented for residual impacts to HBTs including clearing supervision. However, clearing of these five HBTs cannot be avoided. Offsets are required for the removal of these HBTs. These HBTs proposed to be removed are displayed in Figure 8-1.

Table 8-3 Hollow-bearing trees proposed to be removed from the Subject Land

HBT ID	Species	DBH (cm)	Vegetation Zone	Connectivity	Hollow description	Habitat suitability
3	Blakely's Red Gum (<i>Eucalyptus blakelyi</i>)	92	Zone 2	Nearest woodland trees <10 m proximity	Limb 6-10 cm, 10 m	Parrots, possums, bats, birds, arboreal mammals. Gliders unlikely to utilise due to distance from other strips.
8	Yellow Box (<i>Eucalyptus melliodora</i>)	64	Zone 2	Nearest woodland trees ~5 m proximity	Trunk 20-40 cm, 10 m Trunk 11-20 cm, 12 m Trunk 11-20 cm, 12 m	Cockatoos, parrots, possums, owls, bats, birds, arboreal mammals, gliders.
9	Yellow Box (<i>Eucalyptus melliodora</i>)	45	Zone 2	Nearest woodland trees ~5 m proximity	Limb 6-10 cm, 6 m	Parrots, possums, bats, birds, arboreal mammals, gliders.
10	Yellow Box (<i>Eucalyptus melliodora</i>)	90	Zone 2	Nearest woodland trees ~5 m proximity	Limb 6-10 cm, 5 m Limb 11-20 cm, 10 m Limb 6-10 cm, 3 m	Cockatoos, parrots, possums, owls, bats, birds, arboreal mammals, gliders.
17	Blakely's Red Gum (<i>Eucalyptus blakelyi</i>)	151	Zone 1	Nearest woodland trees 10-20 m proximity	Trunk 11-20 cm, 8 m Trunk 20-40 cm, 10 m	Cockatoos, parrots, possums, owls, bats, birds, arboreal mammals, gliders.

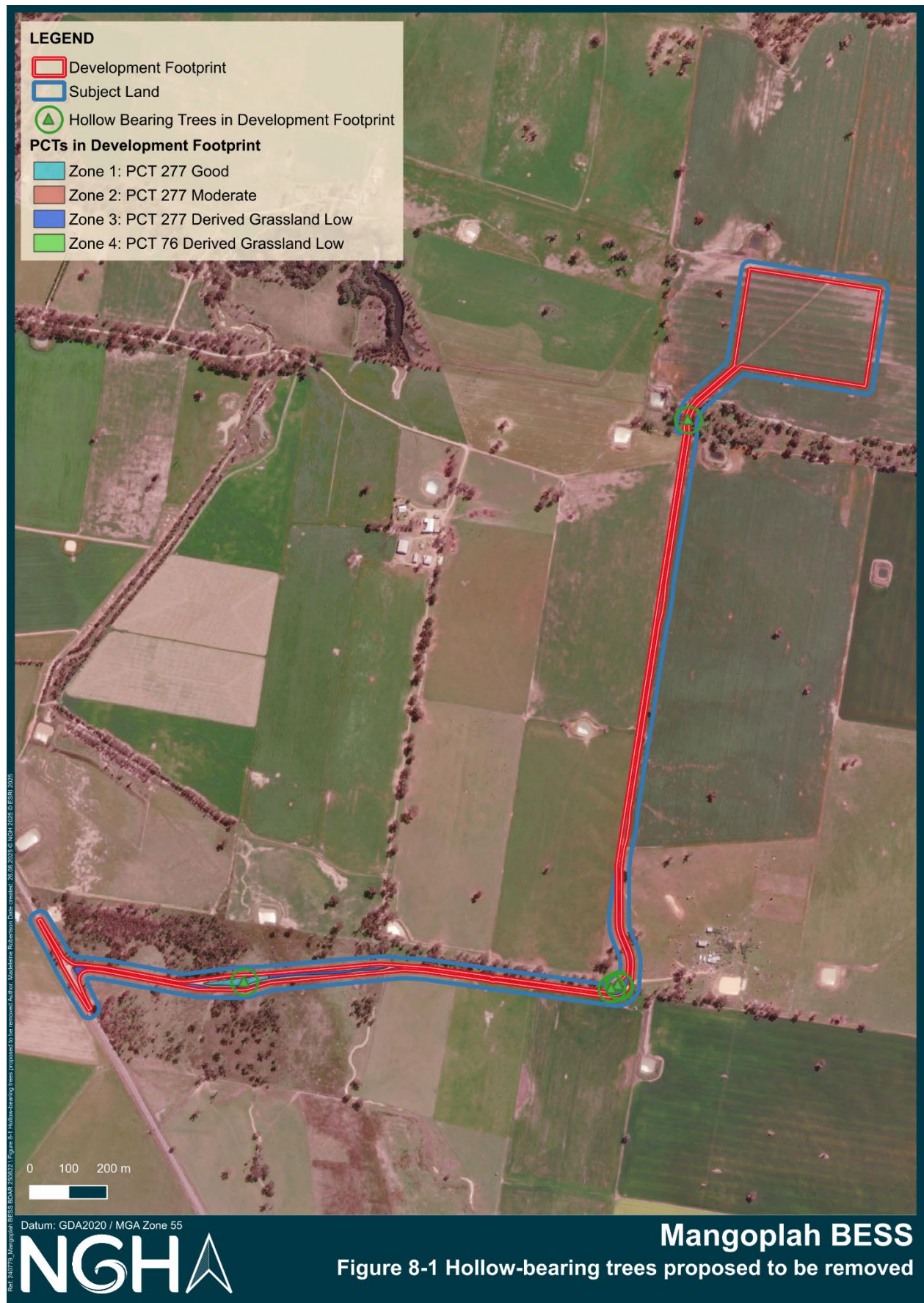


Figure 8-1 Hollow-bearing trees proposed to be removed (NGH, 2025)

8.2. Indirect impacts

Indirect impacts are those that are not directly related to clearing of native vegetation. Indirect impacts that contribute to key threatening processes from the proposal include soil and water contamination, spread of colonisation of weeds, reduced habitat connectivity, generation of noise, light and dust pollution. Table 8-4 describes the type, frequency, intensity, duration and consequences of the indirect impacts of the proposal. Figure 8-2, Figure 8-3 and Figure 8-4 show areas exposed to indirect impacts as a result of the proposal.

Table 8-4 Potential indirect impacts to biodiversity during the construction and operational phases

Indirect impact	Impacted entities	Extent	Frequency/ timing	Duration of the threat	Likelihood and consequences
Inadvertent impacts on adjacent habitat or vegetation Accidental clearing or impacts to vegetation can occur where clearing boundaries are not delineated, or where machinery or materials are stockpiled within driplines of trees.	BC Act Listed TECs: - Box-Gum Woodland - Inland Grey Box Woodland. EPBC Act Listed TECs - Box-Gum Woodland - Grey Box Woodland. PCT 277 Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion. PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions. Ecosystem credit species listed in section 5.1.2. Candidate species detected within the Subject Land or assumed present: - A Spear-grass (<i>Austrostipa wakoolica</i>) - Euphrasia arguta (<i>Euphrasia arguta</i>) - Yass Daisy (<i>Ammobium craspedioides</i>) - Barking Owl (<i>Ninox connivens</i>) - Golden Sun Moth (<i>Synemon plana</i>) - Masked Owl (<i>Tyto novaehollandiae</i>) - Southern Myotis (<i>Myotis macropus</i>)	Subject Land	Irregular during construction phase	Short-term	Likelihood of inadvertent impacts or clearing is high if boundaries are not clearly delineated. Consequence would be high for Serious and Irreversible Impact (SAII) entities, moderate for (non-SAII) TECs and threatened entity habitat and, low for other habitat and native vegetation. Consequences include: - Direct loss of native flora and fauna habitat - Potential for injury and mortality of fauna during clearing of fauna habitat and habitat trees. - Disturbance to avoided HBTs - Increased edge effects - Reduction of arboreal mammal species movement (e.g. Squirrel Gliders) and ground-dwelling species (e.g. Striped Legless Lizard) movement leading to disjunct populations. - Short-term duration but could lead to long-term impacts.

Indirect impact	Impacted entities	Extent	Frequency/ timing	Duration of the threat	Likelihood and consequences
	- Squirrel Glider (<i>Petaurus norfolcensis</i>) - Striped Legless Lizard (<i>Delma impar</i>).				
Reduced viability of adjacent habitat due to edge effects Edge effects can occur where works and/or development occur in close proximity to vegetation, and can include shading, invasion by exotic species, and increase in edge ratios as a result of clearing patches.	BC Act Listed TECs: - Box-Gum Woodland - Inland Grey Box Woodland. EPBC Act Listed TECs - Box-Gum Woodland - Grey Box Woodland. PCT 277 Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion. PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions. Ecosystem credit species listed in section 5.1.2. Candidate species detected within the Subject Land or assumed present: - A Spear-grass (<i>Austrostipa wakoolica</i>) - Euphrasia arguta (<i>Euphrasia arguta</i>) - Yass Daisy (<i>Ammobium craspedioides</i>) - Barking Owl (<i>Ninox connivens</i>) - Golden Sun Moth (<i>Synemon plana</i>) - Masked Owl (<i>Tyto novaehollandiae</i>)	Within 100m of woodland and habitat edges.	Ongoing	Long-term	The location of the Project is in a highly agricultural area, which has historically and presently contributed to edge effects. The Project is likely to contribute to edge effects for the native vegetation patches within the Subject Land. Consequences include habitat loss for threatened species, including HBTs, woodland and grassland habitat. Consequences may also include an increase in fertilizer drift and erosion (Rowley, Edwards, & Kelly, 1993). With mitigation measures in place, invasion by exotic species is not expected to significantly increase as a result of the Project. Erosion and fertiliser drift may occur and may contribute to decreased viability of adjacent habitat.

Indirect impact	Impacted entities	Extent	Frequency/ timing	Duration of the threat	Likelihood and consequences
	- Southern Myotis (<i>Myotis macropus</i>) - Squirrel Glider (<i>Petaurus norfolcensis</i>) - Striped Legless Lizard (<i>Delma impar</i>).				
Increased risk of starvation, exposure and loss of shade or shelter Through vegetation removal and edge effects, potential exists for sheltering locations to be impacted.	Ecosystem credit species listed in section 5.1.2. Candidate species detected within the Subject Land or assumed present: - Barking Owl (<i>Ninox connivens</i>) - Golden Sun Moth (<i>Synemon plana</i>) - Masked Owl (<i>Tyto novaehollandiae</i>) - Southern Myotis (<i>Myotis macropus</i>) - Squirrel Glider (<i>Petaurus norfolcensis</i>) - Striped Legless Lizard (<i>Delma impar</i>).	Subject Land	Irregular during construction and operation phases	Long-term	The likelihood of such impacts is low given the already disturbed nature of the Development Footprint and a minor loss of foraging and breeding habitat. The consequence on bioregional persistence is likely to be low.
Reduced viability of adjacent habitat due to vehicle traffic Adjacent habitat has the potential to be impacted through increased vehicle traffic during construction.	Riparian and aquatic areas. Ecosystem credit species listed in section 5.1.2. Candidate species detected within the Subject Land or assumed present: - A Spear-grass (<i>Austrostipa wakoolica</i>) - Euphrasia arguta (<i>Euphrasia arguta</i>) - Yass Daisy (<i>Ammobium craspedioides</i>) - Barking Owl (<i>Ninox connivens</i>) - Golden Sun Moth (<i>Synemon plana</i>) - Masked Owl (<i>Tyto novaehollandiae</i>) - Southern Myotis (<i>Myotis macropus</i>)	Unknown	Construction phase	Short-term	- May alter fauna activities and/or movements - Minor loss of foraging or breeding habitat. For most species the likelihood and consequence would be low. The likelihood and consequence may be slightly higher for ground-dwelling species and generalists.

Indirect impact	Impacted entities	Extent	Frequency/ timing	Duration of the threat	Likelihood and consequences
	- Squirrel Glider (<i>Petaurus norfolcensis</i>) - Striped Legless Lizard (<i>Delma impar</i>).				
Reduced viability of adjacent habitat due to increased noise Construction activities and operation of machinery can result in increased noise, causing disturbance to local fauna	Ecosystem credit species listed in section 5.1.2. Candidate species detected within the Subject Land or assumed present: - Barking Owl (<i>Ninox connivens</i>) - Golden Sun Moth (<i>Synemon plana</i>) - Masked Owl (<i>Tyto novaehollandiae</i>) - Southern Myotis (<i>Myotis macropus</i>) - Squirrel Glider (<i>Petaurus norfolcensis</i>) - Striped Legless Lizard (<i>Delma impar</i>).	Subject Land and adjacent extending habitat	Construction and operational phases	Short-term	The likelihood is moderate to high during the construction phase and low during the operational phase. Noise is expected to increase during construction as a result of increased vehicle traffic and machinery operation for clearing, construction and associated activities.
Transport of weeds and pathogens from the site to adjacent vegetation Construction and operation involve the movement of machinery and personnel which have the potential to transfer weed seed, and soil containing pathogens.	BC Act Listed TECs: - Box-Gum Woodland - Inland Grey Box Woodland. EPBC Act Listed TECs - Box-Gum Woodland - Grey Box Woodland. Aquatic habitat. PCT 277 Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion. PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the	Subject Land	Construction and operational phases	Long-term	Unmitigated, the likelihood of weed invasion and spread is moderate. The consequence is low to moderate, as the Subject Land and surrounds contain multiple weed species as a result of clearing and agricultural activities. Consequences to TECs and threatened species habitat through weed encroachment is low with mitigation measures in place.

Indirect impact	Impacted entities	Extent	Frequency/ timing	Duration of the threat	Likelihood and consequences
	NSW South Western Slopes and Riverina Bioregions. Ecosystem credit species listed in section 5.1.2. Candidate species detected within the Subject Land or assumed present: • A Spear-grass (<i>Austrostipa wakoolica</i>) • Euphrasia arguta (<i>Euphrasia arguta</i>) • Yass Daisy (<i>Ammobium craspedioides</i>) • Barking Owl (<i>Ninox connivens</i>) • Corben's Long-eared Bat (<i>Nyctophilus corbeni</i>) • Golden Sun Moth (<i>Synemon plana</i>) • Masked Owl (<i>Tyto novaehollandiae</i>) • Southern Myotis (<i>Myotis macropus</i>) • Squirrel Glider (<i>Petaurus norfolcensis</i>) • Striped Legless Lizard (<i>Delma impar</i>).				
Cumulative loss of breeding habitat and competition for remaining resources A reduction in the number of HBTs in the landscape leads to competition and resource stress within both threatened and	Hollow-dependent fauna including woodland birds, arboreal mammals and microbats. Loss of hollows is a key threatening process.	5 HBTs	Construction phase	Long-term	The likelihood of loss of breeding habitat and increased competition is almost certain as clearing will occur. The unmitigated consequence is moderate as the Subject Land occurs in a highly fragmented landscape, which has been historically cleared for agricultural land-use practices. Although 20 HBTs would be avoided in the Subject Land, there is still a

Indirect impact	Impacted entities	Extent	Frequency/timing	Duration of the threat	Likelihood and consequences
non-threatened hollow-dependent fauna.					moderate consequence for fauna species relying on these HBTs.
Trampling of threatened flora species Potential for threatened flora species within or immediately adjacent to Development Footprint being avoided by the works to be trampled by site staff.	Candidate species assumed present within the Subject Land. - A Spear-grass (<i>Austrostipa wakoolica</i>) - Euphrasia arguta (<i>Euphrasia arguta</i>) - Yass Daisy (<i>Ammobium craspedioides</i>).	Approximately 5 m adjacent to the Development Footprint	Construction and operational phases	Long-term	The likelihood of impact to threatened flora species through trampling is low. There is a low likelihood of threatened flora species occupying available habitat due to poor condition soils as a result of long-term agricultural activities. However, the consequence of trampling an incidental find is high.
Inhibition of nitrogen fixation and increased soil salinity Increased soil salinity has the potential to occur as a result of vegetation removal impacting groundwater, bringing salt to surface.	BC Act Listed TECs: - Box-Gum Woodland - Inland Grey Box Woodland. EPBC Act Listed TECs - Box-Gum Woodland - Grey Box Woodland. Aquatic habitat. PCT 277 Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion.	Unknown	Construction and operational phases	Long-term	The likelihood is low, as the Subject Land is already disturbed by agricultural land use activities. The consequence would be moderate as salinity may impact ecosystem functionality.

Indirect impact	Impacted entities	Extent	Frequency/ timing	Duration of the threat	Likelihood and consequences
	PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions. Ecosystem credit species listed in section 5.1.2. Candidate species detected within the Subject Land or assumed present: • A Spear-grass (<i>Austrostipa wakoolica</i>) • Euphrasia arguta (<i>Euphrasia arguta</i>) • Yass Daisy (<i>Ammobium craspedioides</i>) • Barking Owl (<i>Ninox connivens</i>) • Golden Sun Moth (<i>Synemon plana</i>) • Masked Owl (<i>Tyto novaehollandiae</i>) • Southern Myotis (<i>Myotis macropus</i>) • Squirrel Glider (<i>Petaurus norfolcensis</i>) • Striped Legless Lizard (<i>Delma impar</i>).				
Fertiliser drift Fertiliser drift is typically associated with agricultural activities. Increased risk of fertiliser drift has the potential to occur as a result of clearing and	N/A	N/A	N/A	Long-term	The likelihood is negligible. The Subject Land is already disturbed by agricultural land use activities and there is minimal vegetation clearing. No fertiliser is proposed to be used.

Indirect impact	Impacted entities	Extent	Frequency/ timing	Duration of the threat	Likelihood and consequences
maintenance.					
Rubbish dumping Increased accessibility through construction and operational roads, in addition to establishment of public access compounds may allow for access and dumping of rubbish	BC Act Listed TECs: - Box-Gum Woodland - Inland Grey Box Woodland. EPBC Act Listed TECs - Box-Gum Woodland - Grey Box Woodland. PCT 277 Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion. PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions. Ecosystem credit species listed in section 5.1.2. Candidate species detected within the Subject Land or assumed present: - A Spear-grass (<i>Austrostipa wakoolica</i>) - Euphrasia arguta (<i>Euphrasia arguta</i>) - Yass Daisy (<i>Ammobium craspedioides</i>) - Barking Owl (<i>Ninox connivens</i>) - Golden Sun Moth (<i>Synemon plana</i>) - Masked Owl (<i>Tyto novaehollandiae</i>) - Southern Myotis (<i>Myotis macropus</i>)	Subject Land	Construction and operational phases	Long-term	The likelihood of rubbish dumping is moderate during the construction phase if controls are not in place. The likelihood of rubbish dumping during operation are low due to limited public access to the BESS site. The consequence of construction rubbish dumping is moderate as it may lead to degradation of TECs and threatened species habitat.

Indirect impact	Impacted entities	Extent	Frequency/ timing	Duration of the threat	Likelihood and consequences
	- Squirrel Glider (<i>Petaurus norfolcensis</i>) - Striped Legless Lizard (<i>Delma impar</i>).				
Wood collection Increased accessibility through construction and operational roads, in addition to establishment of public access compounds may allow for access and collection of firewood.	BC Act Listed TECs: - Box-Gum Woodland - Inland Grey Box Woodland. EPBC Act Listed TECs - Box-Gum Woodland - Grey Box Woodland. PCT 277 Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion. PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions. Ecosystem credit fauna species listed in section 5.1.2. Candidate fauna species detected within the Subject Land or assumed present: - Barking Owl (<i>Ninox connivens</i>) - Golden Sun Moth (<i>Synemon plana</i>) - Masked Owl (<i>Tyto novaehollandiae</i>) - Southern Myotis (<i>Myotis macropus</i>) - Squirrel Glider (<i>Petaurus norfolcensis</i>)	Limited – more likely near access gate and roadside	Construction and operational phases	Long-term	The likelihood of wood collection is low due to limited public access to the BESS site. The consequence of wood collection is moderate as it may lead to degradation of threatened species habitat and contribute to a key threatening process (loss of dead wood).

Indirect impact	Impacted entities	Extent	Frequency/ timing	Duration of the threat	Likelihood and consequences
	Striped Legless Lizard (<i>Delma impar</i>).				
Increase in predatory and pest animal species populations Increased accessibility in addition to potential food waste storage has potential to increase access for predators and pest animals.	Ecosystem credit species listed in section 5.1.2. Candidate species detected within the Subject Land or assumed present: - A Spear-grass (<i>Austrostipa wakoolica</i>) - Euphrasia arguta (<i>Euphrasia arguta</i>) - Yass Daisy (<i>Ammobium craspedioides</i>) - Barking Owl (<i>Ninox connivens</i>) - Golden Sun Moth (<i>Synemon plana</i>) - Masked Owl (<i>Tyto novaehollandiae</i>) - Southern Myotis (<i>Myotis macropus</i>) - Squirrel Glider (<i>Petaurus norfolcensis</i>) - Striped Legless Lizard (<i>Delma impar</i>).	Subject Land and surrounding vegetation	Construction and operational phases	Long-term	The likelihood is low, as the Subject Land is highly agricultural with both pest and predatory animals previously observed on-site. The consequence is low given the already disturbed nature of the site, and the small area of proposed clearing in comparison to the retained vegetation.
Disturbance to specialist breeding and foraging habitat Removal of hollow-bearing trees, woodland and grassland has potential to reduce area of specialist breeding and foraging habitat.	Ecosystem credit species listed in section 5.1.2. Candidate fauna species detected within the Subject Land or assumed present: - Barking Owl (<i>Ninox connivens</i>) - Golden Sun Moth (<i>Synemon plana</i>) - Masked Owl (<i>Tyto novaehollandiae</i>) - Southern Myotis (<i>Myotis macropus</i>) - Squirrel Glider (<i>Petaurus norfolcensis</i>) - Striped Legless Lizard (<i>Delma impar</i>).	5 HBTs, woodland and grassland	Construction and operational phases	Long-term	Of the threatened species listed, the arboreal mammals, birds and ground-dwelling species are most likely to be impacted by disturbance to their specialist breeding and foraging habitat. For example, the Squirrel Glider utilises eucalypts and hollows for foraging, nesting and breeding. The likelihood of these species being impacted is moderate to high. The consequence would be moderate as the existing landscape within and

Indirect impact	Impacted entities	Extent	Frequency/ timing	Duration of the threat	Likelihood and consequences
					beyond the Subject Land is already highly disturbed. Generalist species have a moderate likelihood of disturbance to their breeding and foraging habitat. The consequence would be low due to the suitable retained/avoided vegetation within the Subject Land and surrounds.
Earthworks and mobilisation of sediments Increased sediment load within waterways and soil movement have potential to occur as a result of construction works.	BC Act Listed TECs: - Box-Gum Woodland - Inland Grey Box Woodland. EPBC Act Listed TECs - Box-Gum Woodland - Grey Box Woodland.	Subject Land	Construction phase	Short-term	There is a low risk of increased sediment load within waterways and soil movement due to sediment and erosion controls to be implemented during construction. The unmitigated consequence of earthworks and mobilisation of sediments is moderate to high and include erosion and sedimentation and/or pollution of soils, dams and downstream habitats.
Increased risk of fire Increased risk of fire ignition during construction of the BESS. Intrinsic fire risk of BESS sites.	BC Act Listed TECs: - Box-Gum Woodland - Inland Grey Box Woodland. EPBC Act Listed TECs - Box-Gum Woodland - Grey Box Woodland. PCT 277 Blakely's Red Gum - Yellow Box	Subject Land	Construction and operational phases	Long-term	There is a moderate risk of componentry failure resulting in a fire. The biodiversity consequences are likely to be low to moderate, assuming containment to the BESS site. Buffers around the BESS will reduce the likelihood of any fire spreading to surrounding vegetation.

Indirect impact	Impacted entities	Extent	Frequency/ timing	Duration of the threat	Likelihood and consequences
	grassy tall woodland of the NSW South Western Slopes Bioregion. PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions. Ecosystem credit species listed in section 5.1.2. Candidate species detected within the Subject Land or assumed present: • A Spear-grass (<i>Austrostipa wakoolica</i>) • Euphrasia arguta (<i>Euphrasia arguta</i>) • Yass Daisy (<i>Ammobium craspedioides</i>) • Barking Owl (<i>Ninox connivens</i>) • Golden Sun Moth (<i>Synemon plana</i>) • Masked Owl (<i>Tyto novaehollandiae</i>) • Southern Myotis (<i>Myotis macropus</i>) • Squirrel Glider (<i>Petaurus norfolcensis</i>) • Striped Legless Lizard (<i>Delma impar</i>).				



Figure 8-2 Areas of Indirect impacts – Map 1 of 3 (NGH, 2025)

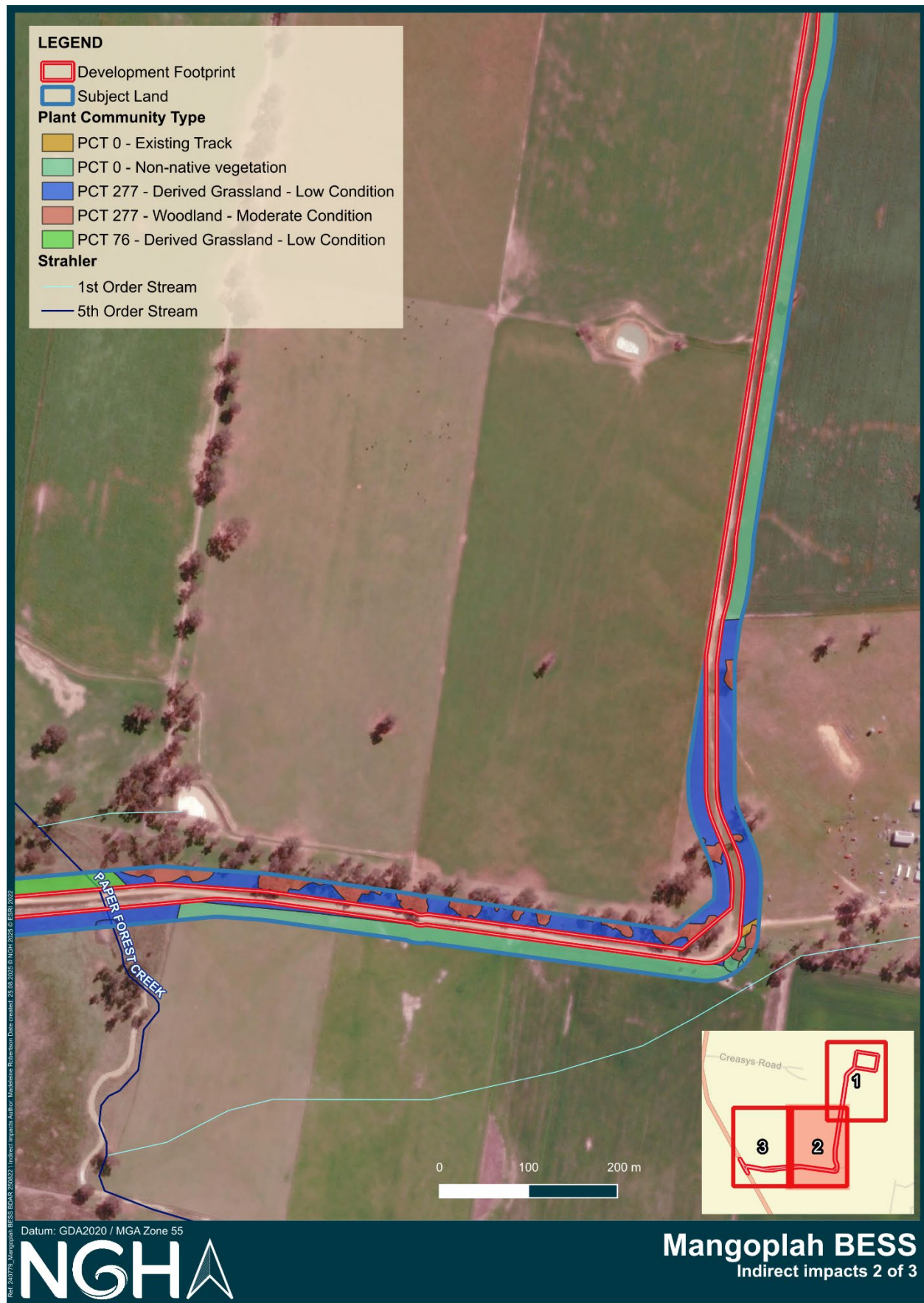


Figure 8-3 Areas of Indirect impacts - Map 2 of 3 (NGH, 2025)

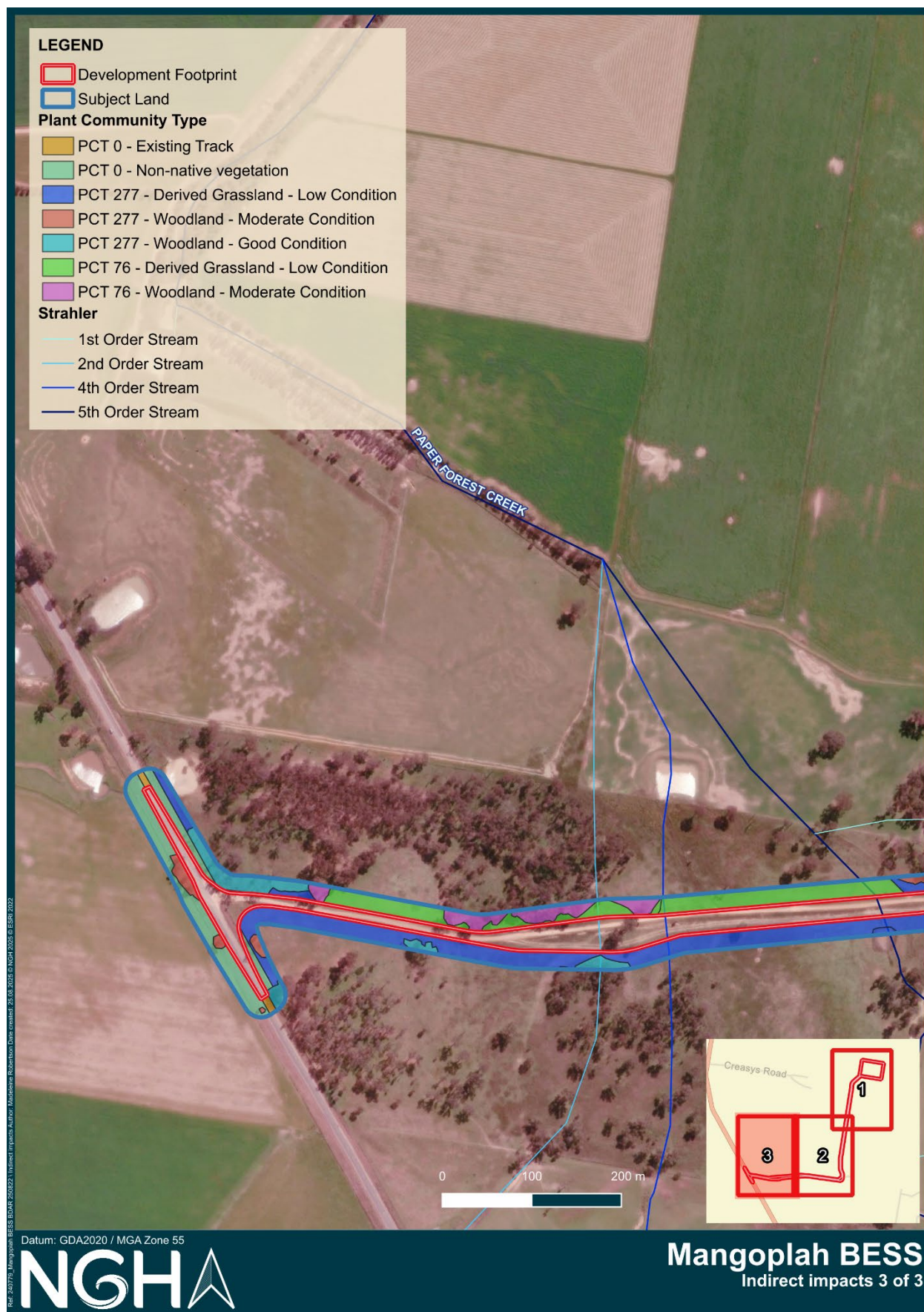


Figure 8-4 Areas of Indirect impacts - Map 3 of 3 (NGH, 2025)

8.3. Prescribed impacts

Table 8-5 describes potential prescribed impacts in the Subject Land and associated with the proposal.

Table 8-5 Nature, extent, duration and possible consequence of prescribed impacts

Prescribed impact	Nature	Extent	Duration	Consequence
Impacts of development on karst, caves, crevices and cliffs, rocks, and other geological features	N/A	N/A	N/A	N/A
Impacts of development on human-made structures	Throughout the Subject Land there are human-made structures including fencing and culverts. The existing access track will be extended and widened as part of the Project.	The culverts will be altered as they occur within the Development Footprint, in the western section of the footprint where the access track is proposed to be widened.	Impacts to human-made structures will occur during the construction phase only.	The consequence is that the development would impact the culvert during the construction phase. It is unlikely that this is going to increase impacts on threatened entities.
Impacts of development on non-native vegetation	Non-native grassland occurs within and adjacent to the Subject Land. Non-native vegetation exists within the Development Footprint, predominantly in the northern section on both sides of the existing access track.	Approximately 9.98 ha of non-native vegetation will be removed from the Development Footprint. This includes exotic grassland.	Impacts to non-native vegetation will occur during the construction phase only.	9.98 ha of non-native vegetation will be removed from the Development Footprint. It is unlikely that the removal of this extent of non-native vegetation would have a significant impact on native threatened fauna due to the abundance of avoided vegetation remaining in the landscape.
Impacts of development on habitat connectivity	Throughout the landscape there are habitat connections for threatened aerial, terrestrial and aquatic species in the form of grassland, woodland, and aquatic habitat. In particular, the	The installation of fencing, road construction and BESS infrastructure is likely to impact connectivity. The species most likely impacted by changes to	Impacts to connectivity within the Development Footprint are expected to be permanent. Impacts are likely to reduce in	The removal of vegetation along the access track within the Development Footprint is likely to contribute to a slight increase in fragmentation within the woodland areas. Therefore, the amount of vegetation

Prescribed impact	Nature	Extent	Duration	Consequence
	removal of woodland for construction of BESS infrastructure and roads could restrict movement of threatened species in the locality.	connectivity are those reliant on habitat within short distances to travel through the landscape. These species include the Squirrel Glider, Sloane's Froglet, Pink-tailed Legless Lizard, Striped Legless Lizard and Golden Sun Moth. These species were either recorded within the Subject Land or assumed present. The Subject Land is already highly fragmented, with an existing access track, property fence lines and historically cleared native vegetation. Despite this, the proposed works may negligibly increase fragmentation and barriers to wildlife movement.	the long term as biodiversity in the area adapts to the presence of the BESS.	to be cleared will likely result in minor impacts to habitat connectivity within the landscape. The removal of vegetation in Zones 1 and 2 would have a minor impact on habitat connectivity due to the large HBTs trees being removed. Due to the low condition of grasslands across the Subject Land, it is unlikely that threatened species inhabiting grasslands would be substantially impacted through its removal. 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.
Impacts of development on water quality, water bodies and hydrological processes	The development has the potential to indirectly impact water quality, water-bodies and hydrological processes that sustain threatened species.	The extent of impacts to this issue is likely to be minor. Paper Forest Creek is within the Development Footprint. There are other small ephemeral creeks located within the Development Footprint and Subject Land, and multiple farm dams located approximately 50-200 m outside of the Subject Land. These have potential to be subject to indirect impacts such	Impacts to waterbodies will likely be confined to the construction period.	The consequence of reduced water quality may impact threatened species that rely on these water sources and habitat, With appropriate mitigation measures in place, impacts are likely to be low. Southern Myotis and Corben's Long-eared Bat may also be impacted by reduced water quality. Correct implementation of safeguards/mitigation will prevent prescribed biodiversity impacts on

Prescribed impact	Nature	Extent	Duration	Consequence
		as polluted runoff, reduction in water quality and sedimentation from construction activities.		waterbodies and water quality.
Impacts of wind turbine strikes	N/A	N/A	N/A	N/A
Impacts of vehicle strikes on threatened fauna, or fauna part of a TEC	The Project would result in increased traffic on the road network during the construction phase and operational phase, which may result in an increased risk of vehicle strikes to threatened fauna. During peak construction, daily movements (two-way) are estimated to include 184 vehicles, with 120 being light vehicles and 64 larger vehicles including but not limited to trucks, semitrailers and B-Doubles. During peak hour, vehicle movements are expected to drop to 64 vehicles. Activities that would increase the number of vehicles on the road include: - Construction of the hardstands for the BESS container units. - Delivery of the key infrastructure components,	The extent of vehicular strike is likely to be low due to construction during daylight hours, with enforced speed limits throughout the construction site.	Over mass and over size vehicles would be required for transportation of BESS infrastructure during construction, in addition to heavy and light vehicles. During operation, low numbers of light vehicle movements are anticipated to deliver operational staff and maintenance crews to site. The occasional heavy vehicle may be utilised to deliver replacement infrastructure components to the site.	The likelihood of a vehicular strike is higher during the construction phase as a result of frequent traffic and over size vehicles. During operation, vehicular strike is likely to be low due to infrequent traffic and absence of oversize vehicles. As a result, consequences from vehicular strike are expected to be low for aerial and arboreal fauna species, and moderate for ground-dwelling fauna species and generalists.

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Prescribed impact	Nature	Extent	Duration	Consequence
	including BESS containers, Heating, Ventilation, and Air Conditioning (HVAC) units, switch gear rooms, control room, cabling, fencing, sand and fill. • Delivery of site personnel. During operation, vehicle access to the site would occur on an irregular basis and include maintenance vans or delivery trucks.			

8.4. Mitigating residual impacts – management measures and implementation

Impacts that cannot be avoided must be mitigated. Presented here is an identification of mitigation measures to address residual direct and indirect, prescribed and uncertain impacts that were identified in the section 8.3 as moderate or above likelihood. Mitigation measures proposed to manage impacts, including proposed techniques, timing, frequency, responsibility for implementing each measure, risk of failure, and an analysis of the consequences of any residual impacts are provided in Table 8-1.

Summary of mitigation measures for direct impacts include:

- Impacts to native vegetation, threatened species and threatened species' habitat to be offset under the Biodiversity Offset Scheme (BOS).
- A trained wildlife handler or fauna spotter catcher (FSC) to be on-site during clearing to mitigate potential impacts to displacement, injury, or death of resident fauna.

Residual direct impacts require further assessment for SAIL (BAM Section 9.1) and to determine a credit requirement (BAM Section 9.2). This is particularly noted where impacts cannot be avoided.

Summary of mitigations for indirect impacts include:

- Inadvertent impacts of adjacent habitat or vegetation can be mitigated through clear physical demarcation of the boundary between areas to be retained and areas slated for clearing.
- Edge effects can be mitigated through weed control protocols.
- Effects of increased vehicle traffic can be mitigated through implementing reduced vehicle speed limits across the site during construction and operation.
- Increased risk of starvation, exposure, loss of shade and shelter can be mitigated by relocating habitat features such as felled timber to adjacent retained habitat.
- Increased risk of noise and light pollution can be mitigated by limiting noise-producing operational work to standard working hours
- Movement of weeds and pathogens can be mitigated by a basic vehicle (and machinery) hygiene protocol.
- Cumulative loss of HBT can be mitigated by timing removal to avoid breeding period of key species (owls, arboreal mammals, hollow-dependent birds).
- Trampling of threatened flora species can be mitigated through adequate delineation of the retained / removed vegetation boundary.
- Inhibition of nitrogen fixation and increased soil salinity can be mitigated by ensuring sediment and erosion controls are implemented.
- Wood collection can be mitigated by relocating felled timber to adjacent retained habitat.
- Disturbance to specialist breeding and foraging habitat can be mitigated by clear physical demarcation of boundaries between retained vegetation and cleared vegetation.
- Mobilisation of sediments can be mitigated through application of standard erosion and sediment control practices.
- Increased risk of fire can be mitigated through hazard reduction planning.

Summary of mitigations for prescribed impacts include:

- Mitigation of development impacts on human-made structures, non-native vegetation and habitat connectivity through clear physical demarcation of the boundaries between retained vegetation and cleared vegetation.
- Implementation of sediment and erosion controls to mitigate impacts of the development on water quality, water bodies and hydrological processes.

- Enforcement of vehicle speed limits across the site during construction and operation to minimise vehicle strikes on threatened fauna, or fauna part of a TEC.

Table 8-6 Summary of proposed mitigation and management measures for residual impacts (direct, indirect and prescribed)

No.	Impact	Mitigation measure	Methods/technique	Timing	Frequency	Responsibility	Likely efficacy	MNES
Direct impacts								
B1	Clearing for construction: reduction in community extent and integrity.	Impacts to native vegetation and threatened species habitat to be offset under the Biodiversity Offset Scheme (BOS).	Use Biodiversity Offset Scheme (BOS) to offset impacts to native vegetation as calculated in this BDAR. Ecosystem Credits via the BAM-C.	Post-approval	One-off	Operator	High	<i>White Box – Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland</i> CEEC.
B2	Clearing for construction: habitat loss, trampling, loss of individuals.	Impacts to threatened species habitat to be offset under the Biodiversity Offset Scheme (BOS).	Use Biodiversity Offset Scheme (BOS) to offset impacts to Species Credit Species as calculated in this BDAR. Species Credit Species via the BAM-C.	Post-approval	One-off	Operator	High	EPBC Act-listed flora and fauna species as per EPBC Act referral including: • A Spear-grass (<i>Austrostipa wakoolica</i>) • Brown Treecreeper (eastern subspecies) (<i>Climacteris picumnus victoriae</i>) • Corben's Long-Eared Bat (<i>Nyctophilus corbeni</i>) • Diamond Firetail (<i>Stagonopleura guttata</i>) • Euphrasia arguta (<i>Euphrasia</i>)

No.	Impact	Mitigation measure	Methods/technique	Timing	Frequency	Responsibility	Likely efficacy	MNES
								<i>arguta</i>) - Fork-tailed Swift (<i>Apus pacificus</i>) - Golden Sun Moth (<i>Synemon plana</i>) - Regent Honeyeater (<i>Anthochaera phrygia</i>) - South-eastern Hooded Robin (<i>Melanodryas cucullata cucullata</i>) - Striped Legless Lizard (<i>Delma impar</i>) - Swift Parrot (<i>Lathamus discolor</i>) - White-throated Needletail (<i>Hirundapus caudacutus</i>) - Yass Daisy (<i>Ammobium craspedioides</i>) - Yellow Wagtail (<i>Motacilla flava</i>).
B3	Habitat loss, displacement of resident fauna, injury or death of fauna.	Trained fauna spotter catcher (FSC) and ecologist on site during clearing events.	Instigating clearing protocols, to include a trained ecologist or licensed wildlife handler to be present during clearing events to check hollows and relocate fauna.	During construction (clearing)	5 HBTs	Construction contractor	Moderate; FSC may be able to detect, remove and/or safeguard individual fauna in	EPBC Act-listed fauna species as per EPBC Act referral including: - Brown Treecreeper (eastern subspecies) (<i>Climacteris picumnus victoriae</i>) - Corben's Long-Eared Bat (<i>Nyctophilus corbeni</i>)

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No.	Impact	Mitigation measure	Methods/technique	Timing	Frequency	Responsibility	Likely efficacy	MNES
			Clearing protocols for arboreal nesting birds include: • Staged clearing of HBTs, supervised by Ecologist or trained spotter catcher to allow for resident fauna to relocate or be relocated where required. • Development of a pre-clearing checklist and tree clearing procedure.				hollows	• Diamond Firetail (<i>Stagonopleura guttata</i>) • Fork-tailed Swift (<i>Apus pacificus</i>) • Golden Sun Moth (<i>Synemon plana</i>) • Regent Honeyeater (<i>Anthochaera phrygia</i>) • South-eastern Hooded Robin (<i>Melanodryas cucullata cucullata</i>) • Striped Legless Lizard (<i>Delma impar</i>) • Swift Parrot (<i>Lathamus discolor</i>) • White-throated Needletail (<i>Hirundapus caudacutus</i>) • Yellow Wagtail (<i>Motacilla flava</i>).
Indirect impacts								
B4	Inadvertent impacts on adjacent habitat or vegetation, including trampling.	Clear physical demarcation of boundary between areas to be retained and areas proposed to be cleared.	Biodiversity Management Plan (BMP) to include: Documented clearance protocols to include demarcation (e.g.	Pre-construction and construction	Ongoing	Contractor	High	<i>White Box – Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland</i> CEEC. EPBC Act-listed flora and fauna species as per EPBC Act referral including: • A Spear-grass (<i>Austrostipa</i>

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No.	Impact	Mitigation measure	Methods/technique	Timing	Frequency	Responsibility	Likely efficacy	MNES
			use of pickets, flagging) of vegetation to be retained. No stockpiling or storage outside of the Development Footprint. Tree Protection Zones (TPZs) for retained woodland. Clearing limits must be delineated prior to proposed commencement of clearing at each area.					<i>wakoolica</i>) • Brown Treecreeper (eastern subspecies) (<i>Climacteris picumnus victoriae</i>) • Corben's Long-Eared Bat (<i>Nyctophilus corbeni</i>) • Diamond Firetail (<i>Stagonopleura guttata</i>) • Euphrasia arguta (<i>Euphrasia arguta</i>) • Fork-tailed Swift (<i>Apus pacificus</i>) • Golden Sun Moth (<i>Synemon plana</i>) • Regent Honeyeater (<i>Anthochaera phrygia</i>) • South-eastern Hooded Robin (<i>Melanodryas cucullata cucullata</i>) • Striped Legless Lizard (<i>Delma impar</i>) • Swift Parrot (<i>Lathamus discolor</i>) • White-throated Needletail (<i>Hirundapus caudacutus</i>) • Yass Daisy (<i>Ammobium craspedioides</i>) • Yellow Wagtail (<i>Motacilla</i>

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No.	Impact	Mitigation measure	Methods/technique	Timing	Frequency	Responsibility	Likely efficacy	MNES
								<i>flava</i>).
B5	Reduced viability of adjacent habitat due to edge effects.	Implementation of weed control protocols.	Biodiversity Management Plan (BMP) to include weed control protocols to prevent spread of weeds within Subject Land.	Construction and operation	Ongoing	Contractor	High	As above.
B6	Reduced viability of adjacent habitat (and fauna death) due to increased traffic.	Reduced vehicle speed limits implemented across the site during construction and operation.	Vehicle impacts will be reduced by: Limit vehicle speeds to 40km/h to reduce the risk of vehicle strike Construction activities are limited to daylight hours to reduce vehicle strikes of nocturnal fauna.	Construction and operation	Ongoing	Contractor and operator	High	EPBC Act-listed fauna species as per EPBC Act referral including: • Brown Treecreeper (eastern subspecies) (<i>Climacteris picumnus victoriae</i>) • Corben's Long-Eared Bat (<i>Nyctophilus corbeni</i>) • Diamond Firetail (<i>Stagonopleura guttata</i>) • Fork-tailed Swift (<i>Apus pacificus</i>) • Golden Sun Moth (<i>Synemon plana</i>) • Regent Honeyeater (<i>Anthochaera phrygia</i>) • South-eastern Hooded Robin (<i>Melanodryas cucullata cucullata</i>) • Striped Legless Lizard (<i>Delma</i>

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No.	Impact	Mitigation measure	Methods/technique	Timing	Frequency	Responsibility	Likely efficacy	MNES
								<i>impar</i>) • Swift Parrot (<i>Lathamus discolor</i>) • White-throated Needletail (<i>Hirundapus caudacutus</i>) • Yellow Wagtail (<i>Motacilla flava</i>).
B7	Increased risk of starvation, exposure, loss of shade and shelter.	Relocate habitat features (e.g. felled timber) to adjacent retained habitat.	Fallen timber and hollow logs should be relocated outside of the construction area under the supervision of an Ecologist or spotter catcher. BMP to detail where features can be relocated.	Construction and operation	Ongoing	Contractor	High	As above.
B8	Reduced viability of adjacent habitat due to increased noise.	Avoid clearing / construction during night-time hours and during breeding season of threatened	EMS includes specification of works to be undertaken during the following times: • Monday – Friday: 7am –	Construction	Ongoing	Contractor and operator	High	As above.

No.	Impact	Mitigation measure	Methods/technique	Timing	Frequency	Responsibility	Likely efficacy	MNES
		fauna species. Planting along the western boundary of the BESS.	6pm Saturday: 8am – 1pm Limited use of lighting.					
B9	Transport of weeds and pathogens from the site to adjacent vegetation.	Weed control and hygiene protocols.	Biodiversity Management Plan (BMP) to include: Weed control and Vehicle and machinery hygiene protocols to prevent spread of weeds within Subject Land.	Construction and operation	To be determined in BMP	Contractor and operator	High	<i>White Box – Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland</i> CEEC. EPBC Act-listed flora and fauna species as per EPBC Act referral including: - A Spear-grass (<i>Austrostipa wakoolica</i>) - Brown Treecreeper (eastern subspecies) (<i>Climacteris picumnus victoriae</i>) - Corben's Long-Eared Bat (<i>Nyctophilus corbeni</i>) - Diamond Firetail (<i>Stagonopleura guttata</i>) - Euphrasia arguta (<i>Euphrasia arguta</i>) - Fork-tailed Swift (<i>Apus pacificus</i>) - Golden Sun Moth (<i>Synemon</i>

No.	Impact	Mitigation measure	Methods/technique	Timing	Frequency	Responsibility	Likely efficacy	MNES
								<i>plana</i>) • Regent Honeyeater (<i>Anthochaera phrygia</i>) • South-eastern Hooded Robin (<i>Melanodryas cucullata cucullata</i>) • Striped Legless Lizard (<i>Delma impar</i>) • Swift Parrot (<i>Lathamus discolor</i>) • White-throated Needletail (<i>Hirundapus caudacutus</i>) • Yass Daisy (<i>Ammobium craspedioides</i>) • Yellow Wagtail (<i>Motacilla flava</i>).
B10	Cumulative loss of breeding habitat and competition for remaining resources.	Avoiding clearing during key breeding periods.	BMP to include details of breeding periods and location of HBTs.	Construction	Ongoing	Contractor and operator	High	EPBC Act-listed fauna species as per EPBC Act referral including: • Brown Treecreeper (eastern subspecies) (<i>Climacteris picumnus victoriae</i>) • Corben's Long-Eared Bat (<i>Nyctophilus corbeni</i>) • Diamond Firetail (<i>Stagonopleura guttata</i>) • Fork-tailed Swift (<i>Apus pacificus</i>)

No.	Impact	Mitigation measure	Methods/technique	Timing	Frequency	Responsibility	Likely efficacy	MNES
								- Golden Sun Moth (<i>Synemon plana</i>) - Regent Honeyeater (<i>Anthochaera phrygia</i>) - South-eastern Hooded Robin (<i>Melanodryas cucullata cucullata</i>) - Striped Legless Lizard (<i>Delma impar</i>) - Swift Parrot (<i>Lathamus discolor</i>) - White-throated Needletail (<i>Hirundapus caudacutus</i>) - Yellow Wagtail (<i>Motacilla flava</i>).
B11	Trampling of threatened flora species.	Clear physical demarcation of boundary between retained and cleared areas.	BMP to include: Documented clearance protocols to include demarcation (e.g. use of pickets, flagging) of vegetation to be retained. Tree Protection Zones (TPZs) for retained woodland.	Construction and operation	Ongoing	Contractor and operator	High	EPBC Act-listed flora species as per EPBC referral including: - A Spear-grass (<i>Austrostipa wakoolica</i>) - Euphrasia arguta (<i>Euphrasia arguta</i>) - Yass Daisy (<i>Ammobium craspedioides</i>).

No.	Impact	Mitigation measure	Methods/technique	Timing	Frequency	Responsibility	Likely efficacy	MNES
			Clearing limits must be delineated prior to proposed commencement of clearing at each area.					
B12	Inhibition of nitrogen fixation and increased soil salinity.	Sediment and erosion controls.	Environmental Management Strategy (EMS) to include details of erosion and sediment control practices in line with the 'Blue Book – Managing Urban Stormwater: soils and construction Vol 1'	Construction and operation	Ongoing	Contractor	High	<i>White Box – Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland</i> CEEC. EPBC Act-listed flora species as per EPBC referral including: • A spear-grass (<i>Austrostipa wakoolica</i>) • Euphrasia arguta (<i>Euphrasia arguta</i>) • Yass Daisy (<i>Ammobium craspedioides</i>).
B14	Rubbish dumping.	High quality construction practices.	EMS to include: List or map of lawful locations for dumping construction rubbish.	Construction	Ongoing	Contractor	High	EPBC Act-listed flora and fauna species as per EPBC Act referral including: • A Spear-grass (<i>Austrostipa wakoolica</i>) • Brown Treecreeper (eastern subspecies) (<i>Climacteris picumnus victoriae</i>) • Corben's Long-Eared Bat

No.	Impact	Mitigation measure	Methods/technique	Timing	Frequency	Responsibility	Likely efficacy	MNES
								(<i>Nyctophilus corbeni</i>) • Diamond Firetail (<i>Stagonopleura guttata</i>) • Euphrasia arguta (<i>Euphrasia arguta</i>) • Fork-tailed Swift (<i>Apus pacificus</i>) • Golden Sun Moth (<i>Synemon plana</i>) • Regent Honeyeater (<i>Anthochaera phrygia</i>) • South-eastern Hooded Robin (<i>Melanodryas cucullata cucullata</i>) • Striped Legless Lizard (<i>Delma impar</i>) • Swift Parrot (<i>Lathamus discolor</i>) • White-throated Needletail (<i>Hirundapus caudacutus</i>) • Yass Daisy (<i>Ammobium craspedioides</i>) • Yellow Wagtail (<i>Motacilla flava</i>).
B15	Wood collection.	Relocate felled timber to adjacent retained	BMP to detail where felled timber has been removed and	Construction and operation	Ongoing	Contractor	High	EPBC Act-listed fauna species as per EPBC Act referral including: • Brown Treecreeper (eastern

No.	Impact	Mitigation measure	Methods/technique	Timing	Frequency	Responsibility	Likely efficacy	MNES
		habitat.	relocated, in areas further from road / public access.					subspecies) (<i>Climacteris picumnus victoriae</i>).
B16	Disturbance to specialist breeding and foraging habitat.	Clear physical demarcation of boundary between retained and cleared areas.	BMP to include: Documented clearance protocols to include demarcation (e.g. use of pickets, flagging) of vegetation to be retained. Tree Protection Zones (TPZs) for retained woodland. Clearing limits must be delineated prior to proposed commencement of clearing at each area. No stockpiling or storage outside of the Development Footprint.	Construction and operation	Ongoing	Contractor	High	EPBC Act-listed fauna species as per EPBC Act referral including: - Brown Treecreeper (eastern subspecies) (<i>Climacteris picumnus victoriae</i>) - Corben's Long-Eared Bat (<i>Nyctophilus corbeni</i>) - Diamond Firetail (<i>Stagonopleura guttata</i>) - Fork-tailed Swift (<i>Apus pacificus</i>) - Golden Sun Moth (<i>Synemon plana</i>) - Regent Honeyeater (<i>Anthochaera phrygia</i>) - South-eastern Hooded Robin (<i>Melanodryas cucullata cucullata</i>) - Striped Legless Lizard (<i>Delma impar</i>) - Swift Parrot (<i>Lathamus discolor</i>) - White-throated Needletail (<i>Hirundapus caudacutus</i>) - Yellow Wagtail (<i>Motacilla</i>

No.	Impact	Mitigation measure	Methods/technique	Timing	Frequency	Responsibility	Likely efficacy	MNES
								<i>flava</i>).
B17	Earthworks and mobilisation of sediments.	Sediment and erosion controls.	Preparation of an EMS to include: Erosion and sediment control practices in line with the 'Blue Book' <i>Managing Urban Stormwater: soils and construction Vol1</i> (Landcom 2004).	Construction	Ongoing	Contractor	High	<i>White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland</i> CEEC. EPBC Act-listed flora and fauna species as per EPBC Act referral including: • A Spear-grass (<i>Austrostipa wakoolica</i>) • Brown Treecreeper (eastern subspecies) (<i>Climacteris picumnus victoriae</i>) • Corben's Long-Eared Bat (<i>Nyctophilus corbeni</i>) • Diamond Firetail (<i>Stagonopleura guttata</i>) • Euphrasia arguta (<i>Euphrasia arguta</i>) • Fork-tailed Swift (<i>Apus pacificus</i>) • Golden Sun Moth (<i>Synemon plana</i>) • Regent Honeyeater (<i>Anthochaera phrygia</i>) • South-eastern Hooded Robin (<i>Melanodryas cucullata cucullata</i>)

No.	Impact	Mitigation measure	Methods/technique	Timing	Frequency	Responsibility	Likely efficacy	MNES
								- Striped Legless Lizard (<i>Delma impar</i>) - Swift Parrot (<i>Lathamus discolor</i>) - White-throated Needletail (<i>Hirundapus caudacutus</i>) - Yass Daisy (<i>Ammobium craspedioides</i>) - Yellow Wagtail (<i>Motacilla flava</i>).
B18	Increased risk of fire.	Built in hazard reduction planning.	Implement a Bushfire Emergency Management and Operations Plan in consultation with NSW RFS and FR NSW. This would include necessary Asset Protection Zones (APZs) included within the development footprint.	Planning	Complete	Proponent	High	As above.
Prescribed impacts								
B19	Impacts of developme	Clear physical demarcation of boundary	Clearing limits must be delineated prior to	Constructi on	Ongoing	Contractor	High	N/A

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No.	Impact	Mitigation measure	Methods/technique	Timing	Frequency	Responsibility	Likely efficacy	MNES
	nt on human-made structures.	between retained and cleared areas.	proposed commencement of clearing at each area.					
B20	Impacts of development on non-native vegetation.	Clear physical demarcation of boundary between retained and cleared areas.	BMP to include: Documented clearance protocols to include demarcation (e.g. use of pickets, flagging) of vegetation to be retained. TPZs for retained woodland. Clearing limits must be delineated prior to proposed commencement of clearing at each area.	Construction	Ongoing	Contractor	High	N/A
B21	Impacts of development on habitat	Clear physical demarcation of boundary between retained and	BMP to include: Documented clearance protocols to include	Construction	Ongoing	Contractor	High	<i>White Box – Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC</i> EPBC Act-listed flora and fauna

No.	Impact	Mitigation measure	Methods/technique	Timing	Frequency	Responsibility	Likely efficacy	MNES
	connectivity	cleared areas.	demarcation (e.g. use of pickets, flagging) of vegetation to be retained. TPZs for retained woodland. Clearing limits must be delineated prior to proposed commencement of clearing at each area.					species as per EPBC Act referral including: • A Spear-grass (<i>Austrostipa wakoolica</i>) • Brown Treecreeper (eastern subspecies) (<i>Climacteris picumnus victoriae</i>) • Corben's Long-Eared Bat (<i>Nyctophilus corbeni</i>) • Diamond Firetail (<i>Stagonopleura guttata</i>) • Euphrasia arguta (<i>Euphrasia arguta</i>) • Fork-tailed Swift (<i>Apus pacificus</i>) • Golden Sun Moth (<i>Synemon plana</i>) • Regent Honeyeater (<i>Anthochaera phrygia</i>) • South-eastern Hooded Robin (<i>Melanodryas cucullata cucullata</i>) • Striped Legless Lizard (<i>Delma impar</i>) • Swift Parrot (<i>Lathamus discolor</i>) • White-throated Needletail (<i>Hirundapus caudacutus</i>)

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No.	Impact	Mitigation measure	Methods/technique	Timing	Frequency	Responsibility	Likely efficacy	MNES
								- Yass Daisy (<i>Ammobium craspedioides</i>) - Yellow Wagtail (<i>Motacilla flava</i>).
B22	Impacts of development on water quality, water bodies and hydrological processes.	Sediment and erosion controls.	Preparation of an EMS to include: Erosion and sediment control practices in line with the 'Blue Book' <i>Managing Urban Stormwater: soils and construction Vol1</i> (Landcom 2004).	Construction	Ongoing	Contractor	High	As above.
B23	Vehicle strikes on threatened fauna, or fauna part of a TEC.	Vehicle speed limits implemented across the site during construction and operation.	Vehicle impacts will be reduced by: - Limit vehicle speeds to 40km/h to reduce the risk of vehicle strike. - Construction activities are limited to daylight hours to reduce vehicle strikes of	Construction and operation	Ongoing	Contractor and operator	High	EPBC Act-listed fauna species as per EPBC Act referral including: - Brown Treecreeper (eastern subspecies) (<i>Climacteris picumnus victoriae</i>) - Corben's Long-Eared Bat (<i>Nyctophilus corbeni</i>) - Diamond Firetail (<i>Stagonopleura guttata</i>) - Fork-tailed Swift (<i>Apus pacificus</i>) - Golden Sun Moth (<i>Synemon plana</i>)

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No.	Impact	Mitigation measure	Methods/technique	Timing	Frequency	Responsibility	Likely efficacy	MNES
			nocturnal fauna.					• Regent Honeyeater (<i>Anthochaera phrygia</i>) • South-eastern Hooded Robin (<i>Melanodryas cucullata cucullata</i>) • Striped Legless Lizard (<i>Delma impar</i>) • Swift Parrot (<i>Lathamus discolor</i>) • White-throated Needletail (<i>Hirundapus caudacutus</i>) • Yellow Wagtail (<i>Motacilla flava</i>).

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Further details on the proposed implementation of recommended mitigation measures are provided below in Table 8-7.

Table 8-7 Implementation of mitigation measures

Impact	Measure/action	Monitoring and evaluation strategy	Performance criteria	Adaptive management threshold	Adaptive management response
Direct impacts					
Clearing for construction: reduction in community extent and integrity.	Biodiversity Offsets.	Credit liability is to be calculated and paid within the required timeframe. Prepare BMP within EMS. BMP to include: Clearing limits and auditing mechanism to ensure limits are not exceeded.	Biodiversity Credits retired. Auditing report shows clearing limits adhered to.	Clearing limits insufficient to capture all construction activities.	Commence project modification process.
Clearing for construction: habitat loss, trampling, loss of individuals.	Biodiversity Offsets.	As above.	As above.	As above.	As above.
Habitat loss, displacement of resident fauna, injury or death of fauna.	Biodiversity Offsets FSC on-site during clearing.	Credit liability is to be calculated and paid within the required timeframe. BMP to include: Requirement for pre-clearance surveys by suitably trained person/s during construction phase Requirement for presence of FSC during removal of important habitat elements (e.g. HBT) during construction phase to relocate or arrange for care of injured	Biodiversity Credits retired. Auditing report shows pre-clearance surveys undertaken and provides details of any FSC responses.	Clearing limits insufficient to capture all construction activities. Unexpected threatened species encountered.	Commence project modification process. Unexpected threatened species find protocol enacted.

Impact	Measure/action	Monitoring and evaluation strategy	Performance criteria	Adaptive management threshold	Adaptive management response
		individuals. Clearing limits and auditing mechanism to ensure limits are not exceeded. Proformas to record details of above actions. Details to be included in audit reports.			
Indirect impacts					
Inadvertent impacts on adjacent habitat or vegetation, including trampling.	Clear physical demarcation of boundary between retained and cleared areas.	BMP to include: - Demarcation (flagging) of no-go zones, vegetation for retention, habitat trees and habitat features. Physical demarcation required; not to rely on operators' GPS. - Maps of threatened flora habitat outside of Development Footprint (using species polygons) and requirement for inclusion in toolbox talks (i.e. contractor briefings).	Audit report shows demarcation undertaken and does not find inadvertent impacts upon adjacent areas.	<u>Trigger 1</u> If adjacent areas found to be impacted, calculate quantum of impact. <u>Trigger 2</u> - For TEC, impact trigger >0.1 ha. - For non-TEC native vegetation, impact trigger >0.5 ha.	<u>Trigger 1</u> Check demarcation is in accordance with BMP. Adjust as necessary to avoid future impact. <u>Trigger 2</u> Consult with BCD.
Reduced viability of adjacent habitat due to edge effects.	As above.	As above.	As above.	As above.	As above.

Impact	Measure/action	Monitoring and evaluation strategy	Performance criteria	Adaptive management threshold	Adaptive management response
Reduced viability of adjacent habitat (and fauna death) due to increased traffic.	Vehicle speed limits implemented across the site during construction and operation.	Safeguards and mitigation measures have been developed include reduced speed limits. . BMP to include: Fencing and demarcation to protect retained vegetation. Mortality survey to document road deaths and commence prior to construction and operation of both the widened access track and road.	Appropriate fencing types being installed at appropriate locations. Vehicle speed limits adhered to in auditing report. Where installation differs from BMP, evidence can be provided of discussions with ecologists for alternative arrangements.	Vehicle speed limits are not adhered to. Fencing not installed or installed with poor adherence to principles / recommendations outlined in BMP.	Investigate reasons for non-compliance, work with contractor to enforce speed limits. Consultation with developer and/or construction contractor.
Increased risk of starvation, exposure, loss of shade and shelter.	Relocate habitat features (e.g. felled timber) to adjacent retained habitat.	BMP to include: - Pre-clearance survey (early during construction phase) to identify areas where habitat features occur in high density in Development Footprint. This may be done in stages. - Survey to identify areas outside Development Footprint (in adjacent habitat) where removed habitat features can be re-located. This may be done in stages. - Maps of above to be provided to construction contractor following survey and in later	Auditing report can demonstrate record-keeping in relation to HBT cleared relocation of habitat features.	Relocation of felled timber unable to be completed.	Provide justification in auditing report e.g. description and photos of receiving habitat.

Impact	Measure/action	Monitoring and evaluation strategy	Performance criteria	Adaptive management threshold	Adaptive management response
		audit report. Auditing mechanisms to check effective relocation of features and FSC activity.			
Reduced viability of adjacent habitat due to increased noise	Avoid clearing / construction during night-time hours and during breeding season of threatened fauna species. Works to be undertaken during the following times: - Monday – Friday: 7am – 6pm - Saturday: 8am – 1pm.	EMS to: Specify works to be undertaken during day as much as possible to avoid light spill at night. Require light shields installed on construction compound to minimise light spill.	Auditing report verifies hours of operation and light shield installation.	No light shields installed.	Investigate reasons for non-compliance, work with contractor to achieve impact reduction or avoidance.
Transport of weeds and pathogens from the site to adjacent vegetation.	Weed control and hygiene protocol.	BMP will include actions in accordance with (DPI, 2020): - Buffer zones - Designated parking areas - Standard basic vehicle hygiene protocol (wash-down facilities) in line with NSW <i>Hygiene Guidelines</i> (DPIE 2020) and best practice weed	Audit report will compile forms from construction company.	Audit report finds poor adherence to protocols.	Investigate the matter with reference to the <i>Biosecurity Act 2015</i> (Biosecurity Act).

Impact	Measure/action	Monitoring and evaluation strategy	Performance criteria	Adaptive management threshold	Adaptive management response
		management consistent with guidelines provided by DPI NSW, focusing on priority weeds. Proformas for construction company to fill out to evidence adherence.			
Cumulative loss of breeding habitat and competition for remaining resources.	Avoiding clearing during key breeding periods.	BMP to include: - Details of breeding/torpor periods of key species. - Details of HBT / hollows to be cleared.	Auditing report would demonstrate that record-keeping has occurred for cleared HBTs and outside key breeding periods.	Clearing of HBTs has not occurred during identified periods.	Investigate reasons for non-compliance. Consultation with developer and/or construction contractor.
Trampling of threatened flora species.	Clear physical demarcation of boundary between retained and cleared areas.	BMP to include: Demarcation (flagging) of no-go zones, vegetation for retention, habitat trees and habitat features. Physical demarcation required; not to rely on operators' GPS. Maps of threatened flora habitat outside of Development Footprint (using species polygons) and requirement for inclusion in toolbox talks (i.e. contractor briefings).	Audit report shows demarcation undertaken and does not find inadvertent impacts upon adjacent areas.	<u>Trigger 1</u> If adjacent areas found to be impacted, calculate quantum of impact. <u>Trigger 2</u> For native vegetation, impact trigger >0.5 ha.	<u>Trigger 1</u> Check demarcation is in accordance with BMP. Adjust as necessary to avoid future impact. <u>Trigger 2</u> Consult with BCD.

Impact	Measure/action	Monitoring and evaluation strategy	Performance criteria	Adaptive management threshold	Adaptive management response
Inhibition of nitrogen fixation and increased soil salinity.	Sediment and erosion controls	EMS to include: Erosion and sediment control practices in line with the 'Blue Book' <i>Managing Urban Stormwater: soils and construction Vol1</i> (Landcom 2004). Auditing report to ensure adherence.	Auditing report finds adherence.	Auditing report does not find adherence.	Consultation with developer and/or construction contractor with reference to the <i>Protection of the Environment Operations Act 1997</i> .
Fertiliser drift.	Sediment and erosion controls.	EMS to include: Erosion and sediment control practices in line with the 'Blue Book' <i>Managing Urban Stormwater: soils and construction Vol1</i> (Landcom 2004). Auditing report to ensure adherence.	Auditing report finds adherence.	Auditing report does not find adherence.	Consultation with developer and/or construction contractor with reference to the <i>Protection of the Environment Operations Act 1997</i> .
Rubbish dumping.	High quality construction practices.	A Waste Management Plan would be incorporated into the EMS, applying the principles to avoid, re-use and recycle to minimise wastes. EMS will include: List or map of lawful locations	Auditing report finds adherence.	Auditing report does not find adherence.	Consultation with developer and/or construction contractor with reference to the <i>Protection of the Environment Operations Act 1997</i> .

Impact	Measure/action	Monitoring and evaluation strategy	Performance criteria	Adaptive management threshold	Adaptive management response
		for dumping construction rubbish. - Requirement for the construction contractor to present a construction and demolition waste plan in line with <i>Construction and demolition waste: a management toolkit</i> (EPA NSW 2020). - Auditing report to ensure adherence.			
Wood collection.	Relocate felled timber to adjacent retained habitat.	BMP to include recommendations for felled timber relocation.	Auditing report can demonstrate record-keeping in relation to locations of felled timber	Relocation of felled timber unable to be completed.	Provide justification in auditing report e.g. description and photos of receiving habitat.
Increase in predatory and pest animal species populations.	Hygiene protocol to minimise prevalence of pest animals.	The proposal is unlikely to lead to an increase in the prevalence of pest animals. By following biosecurity protocols, the number of pest animals is not likely to increase as a result of additional clearing and construction. Proformas for construction	Audit report will compile forms from construction company.	Audit report finds poor adherence to protocols.	Investigate the matter with reference to the Biosecurity Act.

Impact	Measure/action	Monitoring and evaluation strategy	Performance criteria	Adaptive management threshold	Adaptive management response
		company to fill out to evidence adherence.			
Disturbance to specialist breeding and foraging habitat.	Clear physical demarcation of boundary between retained and cleared areas.	BMP to include: Demarcation (flagging) of no-go zones, vegetation for retention, habitat trees and habitat features. Physical demarcation required; not to rely on operators' GPS. Maps of threatened flora habitat outside of Development Footprint (using species polygons) and requirement for inclusion in toolbox talks (i.e. contractor briefings).	Audit report shows demarcation undertaken and does not find inadvertent impacts upon adjacent areas.	<u>Trigger 1</u> If adjacent areas found to be impacted, calculate quantum of impact. <u>Trigger 2</u> - For TEC, impact trigger >0.1 ha. - For non-TEC native vegetation, impact trigger >0.5 ha.	<u>Trigger 1</u> Check demarcation is in accordance with BMP. Adjust as necessary to avoid future impact. <u>Trigger 2</u> Consult with BCD.
Earthworks and mobilisation of sediments.	Sediment and erosion controls.	EMS to include: - Erosion and sediment control practices in line with the 'Blue Book' <i>Managing Urban Stormwater: soils and construction Vol1</i> (Landcom 2004). - Auditing report to ensure adherence.	Auditing report finds adherence.	Auditing report does not find adherence.	Consultation with developer and/or construction contractor with reference to the <i>Protection of the Environment Operations Act 1997</i> .

Impact	Measure/action	Monitoring and evaluation strategy	Performance criteria	Adaptive management threshold	Adaptive management response
Increased risk of fire.	Built-in hazard reduction planning.	Planning phase has incorporated separation distances, asset protection zone, emergency egress provision to west of site and water supply for firefighting.	Any fires ignited on site do not spread to adjacent vegetation.	Fires ignited on site have potential to spread to adjacent vegetation or have spread.	Consultation with Rural Fire Service to improve the containment of fires at BESS site.
Prescribed impacts					
Human-made structures.	Clear physical demarcation of development footprint.	EMS to include clear demarcation (flagging, poles, fencing) of development footprint.	Audit report shows demarcation undertaken and does not find inadvertent impacts upon adjacent areas.	If adjacent areas found to be impacted, calculate quantum of impact.	Check demarcation is in accordance with EIS. Adjust as necessary to avoid future impact.
Non-native vegetation.	Clear physical demarcation of boundary between retained and cleared areas to avoid retained non-native vegetation.	BMP to include: Demarcation (flagging) of no-go zones, vegetation for retention, habitat trees and habitat features. Physical demarcation required; not to rely on operators' GPS. Maps of non-native vegetation outside of Development Footprint (using species polygons) and requirement for inclusion in toolbox talks (i.e. contractor briefings).	Audit report shows demarcation undertaken and does not find inadvertent impacts upon adjacent areas.	If adjacent areas found to be impacted, calculate quantum of impact.	Check demarcation is in accordance with BMP. Adjust as necessary to avoid future impact.
Habitat connectivity.	Clear physical	BMP to include:	Audit report shows	<u>Trigger 1</u>	<u>Trigger 1</u>

Impact	Measure/action	Monitoring and evaluation strategy	Performance criteria	Adaptive management threshold	Adaptive management response
	demarcation of boundary between retained and cleared areas to avoid retained habitat.	Demarcation (flagging) of no-go zones, vegetation for retention, habitat trees and habitat features. Physical demarcation required; not to rely on operators' GPS. Maps of habitat outside of Development Footprint (using species polygons) and requirement for inclusion in toolbox talks (i.e. contractor briefings).	demarcation undertaken and does not find inadvertent impacts upon adjacent areas.	If adjacent areas found to be impacted, calculate quantum of impact. <u>Trigger 2</u> - For TEC, impact trigger >0.1 ha. - For non-TEC native vegetation, impact trigger >0.5 ha.	Check demarcation is in accordance with BMP. Adjust as necessary to avoid future impact. <u>Trigger 2</u> Consult with BCD.
Water quality, water bodies and hydrological processes.	Sediment and erosion controls to minimise impacts.	EMS to include: Erosion and sediments control practices in line with the 'Blue Book' (Landcom, 2004). Auditing report to ensure adherence	Auditing report finds adherence.	Auditing report does not find adherence.	Consultation with developer and/or construction contractor with reference to the <i>Protection of the Environment Operations Act 1997</i> .
Vehicle strikes on threatened fauna, or fauna part of a TEC.	Implementation of vehicle speed limits and number of vehicles on site to avoid strike.	EIS to state vehicle speed limits and limit the number of vehicles on site following vehicle traffic report.	Auditing report finds adherence and no strikes occur.	Auditing report does not find adherence or a strike occurs.	Immediately stop works and report to CPHR.

8.5. Adaptive management strategy for uncertain impacts

Residual indirect or prescribed impacts for which no mitigation measures are proposed require an adaptive management strategy (BAM Section 8.5). Adaptive management during construction and operation will be receptive to any new and relevant data that may arise through ongoing assessment and monitoring and is key to the successful implementation of the relevant management plans. Construction management plans for biodiversity will have an adaptive management component. This includes measures to respond to impacts that are predicted to have a low risk, if they occur at a higher frequency or severity than expected. The known low risk impact is:

- Trampling of threatened flora.

Other impacts may come to fore during construction and can be dealt with adaptively in real-time.

Table 8-8 Adaptive management strategy for uncertain impacts

Impact type	Description	Likelihood & extent	Baseline data required	Performance indicators	Risk of failure	Management actions
Trampling of threatened flora species.	Inadvertent damage or loss of threatened flora individuals, which are not known to occur in the Development Footprint.	Low – the Development Footprint is on agricultural land and is continuously subjected to agricultural-related activities, therefore the likelihood of presence is low.	Existing baseline data provides evidence of low likelihood of threatened flora presence.	An unexpected plant is found on site by a FSC or contractor.	Moderate – not all site personnel may recognise a threatened species.	Implement an unexpected finds procedure, which may involve a stop work order, further surveys to delineate population and assessments of significance or liaison with agencies.

9. Serious and irreversible impacts (SII)

9.1. Assessment for serious and irreversible impact on biodiversity values

This section addresses Section 10.2 of the BAM and follows the guidance to assist a decision-maker to determine a serious and irreversible impact (DPE, 2020).

All threatened entities impacted by the proposal have been considered if the form or have the potential to be Serious and Irreversible Impact (SII) entities. The criteria used to determine if a development will have serious and irreversible impacts include impacts that:

- Will cause a further decline of the species or ecological community that is currently observed, estimated, inferred, or reasonably suspected to be in a rapid rate of decline, or
- Will further reduce the population size of the species or ecological community that is currently observed, estimated, inferred, or reasonably suspected to have a very small population size, or
- Impact on the habitat of a species or ecological community that is currently observed, estimated, inferred, or reasonably suspected to have a very limited geographic distribution, or
- Impact on a species or ecological community that is unlikely to respond to measures to improve habitat and vegetation integrity and is therefore irreplaceable.

One TEC occurring within the Development Footprint is classified as a SII entity, in addition to one threatened flora species, as indicated in Table 9-1 below.

Table 9-1 Entities at risk of an SII

SII Entity	Reason for inclusion in assessment
Threatened Ecological Communities	
<i>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.</i>	Included in current list of entities at risk of an SII and is likely to be impacted by the proposal
Flora	
<i>Euphrasia arguta</i> <i>Euphrasia arguta</i>	Included in current list of entities at risk of an SII and is likely to be impacted by the proposal

9.1.1. Additional impact assessment provisions for threatened ecological communities at risk of an SAI

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.

Actions to avoid and minimise direct and indirect impacts

Section 7 and section 8 provide details on avoidance, minimisation and mitigation of impacts to biodiversity values, including Box-Gum Woodland. Impacts are minimised through overall site selection, by utilising an area with an existing access track so that an entirely new track did not need to be cleared of native vegetation. Selection of widening track areas with low density woodland also minimised the area of Box Gum Woodland requiring clearing. Additional actions have been undertaken to avoid and minimise direct and indirect impacts (including mitigation measures) to Box-Gum Woodland, including:

- Clear physical demarcation of clearing extent
- Weed control and hygiene protocol to prevent the spread of pathogens and weeds
- Offset unavoidable clearing impacts.

Current status of this TEC is detailed below in Table 9-2 below. The distribution of this TEC within and surrounding the Subject Land is shown in Figure 9-1, Figure 9-2 and Figure 9-3.

Current status (excluding impacts of the proposal)

Table 9-2 Current status of the *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.*

Criteria	Data / Information	Data sources	Details of data deficiency, assumptions, reasons for low confidence in information (e.g. TBDC indicates data is unknown or deficient)
Evidence of reduction in geographic distribution (Principle 1) as the current total geographic extent of the TEC in NSW and the estimated reduction in geographic extent of the TEC since 1970			
Current total geographic extent (ha) of the TEC in NSW	Benson (2008) estimated approximately 40,000 ha remains based on extant of associated PCTs. However, this is likely an underestimate as the NSW area of the more	Scientific Determination for Box-Gum Woodland (NSW Threatened Species Scientific Committee, 2020) (EPBC Threatened Species Scientific	There is uncertainty of pre-1750 extent and values for EOO are considered an underestimate (NSW Threatened Species Scientific Committee, 2020).

Criteria	Data / Information	Data sources	Details of data deficiency, assumptions, reasons for low confidence in information (e.g. TBDC indicates data is unknown or deficient)
	restricted EPBC Act listed Box-Gum Woodland community is 250,729 ha. Extent of occurrence (EOO) is 702,800 km ² ; area of occupancy is 151,100 km ² .	Committee, 2006)	
Estimated reduction in geographic extent of the TEC since 1970	TBDC displays a population reduction of $\geq 80\%$ in 10 years or three generations. The community has an observed, estimated, inferred, or reasonably suspected to have undergone, or be projected to undergo, a very large reduction in distribution, being: (1) $\geq 90\%$ reduction where the reduction is measured since 1750 (historical decline) ; or (2) $\geq 80\%$ reduction where the reduction is over a 50-year period, either in the past, future, or any part of the past, present and future. There has been a “very large” reduction in geographic distribution although loss since 1970 unknown. It is estimated that around 7% of pre-1750 distribution remains in NSW. Loss between 2009-2017	TBDC - <i>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</i> (OEH, 2025) Scientific Determination for Box-Gum Woodland (NSW Threatened Species Scientific Committee, 2020) (EPBC Threatened Species Scientific Committee, 2006)	High variation in estimates, measure of tree canopy only not ecological functioning and understory condition (NSW Threatened Species Scientific Committee, 2020)

Criteria	Data / Information	Data sources	Details of data deficiency, assumptions, reasons for low confidence in information (e.g. TBDC indicates data is unknown or deficient)
	estimated at 9,056 ha due to agriculture and infrastructure, an average annual loss of 550 ha. Conservatively assuming a similar rate between 1970 and 2008 (38 years), around 30,000 ha may have been lost.		
Extent of reduction in ecological function, describing the degree of environmental degradation or disruption to biotic processes (Principle 2) indicated by factors listed in BAM Subsection 9.1.1(2.b.) There are large knowledge gaps for both the current and historic extent of this ecological community, particularly in the northwest of its distribution in NSW. The TBDC states that there are < 50 individuals or < 250 individuals where threats are known (OEH, 2025). This TEC has been heavily cleared across the majority of its range, with highly fragmented patches remaining. These occur in small, isolated patches within a cleared landscape, or within other disturbed woodlands. A large proportion of the remaining patches have been modified and occur as tree cover of a predominantly exotic understory. Loss of species diversity as a result of degradation and fragmentation including clearing, are the major causes of function, structure and composition loss. There are no remaining areas that could be considered fully intact, as most patches are subjected to some level of weed invasion. This TEC has been subjected to a loss of native understory, species diversity, invasion by exotic species and loss of structural integrity. This TEC is likely to be detrimentally affected by further exotic species invasion, and landscape-scale effects including salinity, nutrient enrichment, soil structural decline and altered fire regimes (EPBC Threatened Species Scientific Committee, 2006).			
Evidence of restricted geographic distribution (Principle 3) based on the TEC's geographic range in NSW			
Extent of occurrence (ha)	The NSW Threatened Species Scientific Committee (TSSC) Final Determination states that the geographic distribution of White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived	Scientific Determination for Box Gum Woodland (NSW Threatened Species Scientific Committee, 2020) Guidelines for the application of IUCN Red List of Ecosystems Categories and Criteria	-

Criteria	Data / Information	Data sources	Details of data deficiency, assumptions, reasons for low confidence in information (e.g. TBDC indicates data is unknown or deficient)
	Native Grassland is not restricted. The best estimate of the extent of occurrence (EOO) is 70,280,000 ha based on a minimum convex polygon enclosing likely occurrences of the community, the method of assessment recommended by the International Union for Conservation of Nature (IUCN) for assessing extent of occurrence.	(Keith, et al., 2024)	
Area of occupancy (ha)	The best estimate of the area of occupancy (AOO) is 15,110,000 ha based on 10 x 10 km grid cells (with a minimum of 1% occupied by the community), the scale recommended by IUCN for assessing AOO.	Scientific Determination for Box Gum Woodland (NSW Threatened Species Scientific Committee, 2020) Guidelines for the application of IUCN Red List of Ecosystems Categories and Criteria (Keith, et al., 2024)	
Number of threat-defined locations	There appear to be no threat-defined locations in NSW, although it is noted that most high quality remnants remain only in cemeteries, travelling stock reserves and railways easements.	Scientific Determination for Box-Gum Woodland (NSW Threatened Species Scientific Committee, 2020) Guidelines for the application of IUCN Red List of Ecosystems Categories and Criteria (Keith, et al., 2024)	
Evidence that the TEC is unlikely to respond to management (Principle 4)			

Criteria	Data / Information	Data sources	Details of data deficiency, assumptions, reasons for low confidence in information (e.g. TBDC indicates data is unknown or deficient)
This TEC has undergone a severe decline in area of occupancy due to clearing and degradation. It is continuously subjected to ongoing threats across the range, including further clearing, deterioration of remnant condition and degradation of landscape where remnant patches occur (EPBC Threatened Species Scientific Committee, 2006).			

Impact assessment

The impact assessment for this TEC can be seen in Table 9-3 below.

Table 9-3 Impact assessment for the *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*.

Criteria	Data / Information	Data sources	Details of data deficiency, assumptions, reasons for low confidence in information (e.g. TBDC indicates data is unknown or deficient)
Impact on the geographic extent of the TEC (Principles 1 and 3)			
Area of TEC to be impacted by the proposal (ha)	Total area: 0.22 ha Zone 1 PCT 277 Good Condition: 0.22 ha Zone 2 PCT 277 Moderate Condition: 0.13 ha Zone 3 P277 Derived Grassland Low Condition: 1.50ha	N/A	N/A
Area of TEC to be impacted by the proposal as a % of the current	Extant Box Gum Woodland in NSW may be around	N/A	N/A

Criteria	Data / Information	Data sources	Details of data deficiency, assumptions, reasons for low confidence in information (e.g. TBDC indicates data is unknown or deficient)
geographic extent in NSW (%)	1,673,954 ha ² - up to 1.85 ha will be directly impacted by the proposal, equating to approximately 0.000013% of the current extent in NSW.		
Direct/indirect impacts likely as a result of the proposal to contribute to loss of flora/fauna species characteristic of the TEC (BAM Subsection 9.1.1(4.a.ii.))	A total direct impact of 1.85 ha of Box-Gum Woodland.	N/A	N/A
Impacts likely to contribute to further environmental degradation or disruption of biotic processes (Principle 2)			
Remaining extent of isolated areas of TEC (ha)	6.63 ha of Box Gum Woodland will remain within the Subject Land and 88.7 ha would remain as part of the patches connected to the Development Footprint.	State Vegetation Mapping ESRI Satellite NGH Vegetation Surveys	This calculation is a best estimate based on NSW State Vegetation Type Mapping, Aerial Imagery and NGH Survey Data. It is possible the true extent is slightly greater than or less than the reported amount, however, this estimate is considered the best estimate of Box Gum

² Calculated from NSW SVTM by using PCT association list for TEC profile 10837 and selecting these PCTs in the latest SVTM attribute table for all of NSW.

Criteria	Data / Information	Data sources	Details of data deficiency, assumptions, reasons for low confidence in information (e.g. TBDC indicates data is unknown or deficient)
			Woodland in the surrounding areas.
Average distance between remaining remnants – remnant is retained (m)	If the remnants were retained, the average distance between the current remnant patch is approximately 10 m across the current access track.	State Vegetation Mapping ESRI Satellite NGH Vegetation Surveys	Calculated using GIS and Euclidean distances.
Average distance between remaining remnants – remnant is removed (m)	If the remnants were removed, the average distance between the remaining remnants would be approximately 20 m across the current access track, with a maximum distance of 40m at one point.	State Vegetation Mapping ESRI Satellite NGH Vegetation Surveys	Calculated using GIS and Euclidean distances.
Estimated maximum dispersal distance of species associated with the TEC (km)	There are many species characteristic of this TEC. The characteristic overstorey trees are White Box, Yellow Box and/or Blakely's Red Gum. A 2017 review estimates the dispersal speed of most eucalypts at 1-2m per year (NSW DCCEW, 2024).		
Area to perimeter ratio of remaining remnants (ratio)	The area-to-perimeter ratios below ('A/P ratio') were calculated for woodland patches that will retain remnants following proposed clearing. Generally, a low A/P ratio indicates greater irregularity or complexity in the shape of a habitat patch. Conversely, a higher A/P ratio typically indicates more regular and compact shapes which is often associated with more efficient movement of species between patches and the long-		

Criteria	Data / Information	Data sources	Details of data deficiency, assumptions, reasons for low confidence in information (e.g. TBDC indicates data is unknown or deficient)																				
	term viability of threatened ecological communities. There is minimal change in the area to perimeter ratio before and after clearing.																						
	<table><tr><th>Patch Number</th><th>Area to Perimeter Ratio Before</th><th>Area to Perimeter Ratio After</th><th>Decrease / Increase in Ratio</th></tr><tr><td>1</td><td>10920m²/491.55m = 22.22</td><td>10910 m²/490.2m = 22.25</td><td>+0.03</td></tr><tr><td>2</td><td>65500 m²/2340.08m = 27.99</td><td>63300 m²/1986.7m = 31.86</td><td>+3.87</td></tr><tr><td>3</td><td>47100 m²/3423.28m = 13.76</td><td>46500 m²/3388.9m = 13.72</td><td>-0.04</td></tr><tr><td>4</td><td>71600 m²/2995.3m = 23.90</td><td>71100 m²/3002.7m = 23.68</td><td>-0.22</td></tr></table>	Patch Number	Area to Perimeter Ratio Before	Area to Perimeter Ratio After	Decrease / Increase in Ratio	1	10920m ² /491.55m = 22.22	10910 m ² /490.2m = 22.25	+0.03	2	65500 m ² /2340.08m = 27.99	63300 m ² /1986.7m = 31.86	+3.87	3	47100 m ² /3423.28m = 13.76	46500 m ² /3388.9m = 13.72	-0.04	4	71600 m ² /2995.3m = 23.90	71100 m ² /3002.7m = 23.68	-0.22		
Patch Number	Area to Perimeter Ratio Before	Area to Perimeter Ratio After	Decrease / Increase in Ratio																				
1	10920m ² /491.55m = 22.22	10910 m ² /490.2m = 22.25	+0.03																				
2	65500 m ² /2340.08m = 27.99	63300 m ² /1986.7m = 31.86	+3.87																				
3	47100 m ² /3423.28m = 13.76	46500 m ² /3388.9m = 13.72	-0.04																				
4	71600 m ² /2995.3m = 23.90	71100 m ² /3002.7m = 23.68	-0.22																				
Vegetation Condition and Vegetation Integrity	Box-Gum Woodland within the Development Footprint consists as three condition zones. Zone 1: PCT 277 Good Condition: 0.22 ha Zone 2: PCT 277 Moderate Condition: 0.13 ha Zone 3: P277 Derived Grassland Low Condition: 1.50ha The majority of the TEC to be impacted is comprised of a Derived Grassland in low condition. This grassland is a mix of native and exotic species and heavily disturbed from livestock grazing and agricultural activities and occurs alongside the current access track. The higher condition Box-Gum Woodland have mostly been avoided by the proposal design. The vegetation integrity scores for each of the zones are shown in the following table. <table><tr><th>Vegetation zone ID</th><th>PCT/Zone</th><th>Composition condition score</th><th>Structure condition score</th><th>Function condition score</th><th>Vegetation Integrity Score</th><th>HBTs present?</th></tr><tr><td>1</td><td>277 Good</td><td>49.5</td><td>86</td><td>38.2</td><td>54.6</td><td>Yes</td></tr></table>			Vegetation zone ID	PCT/Zone	Composition condition score	Structure condition score	Function condition score	Vegetation Integrity Score	HBTs present?	1	277 Good	49.5	86	38.2	54.6	Yes						
Vegetation zone ID	PCT/Zone	Composition condition score	Structure condition score	Function condition score	Vegetation Integrity Score	HBTs present?																	
1	277 Good	49.5	86	38.2	54.6	Yes																	

Criteria	Data / Information		Data sources			Details of data deficiency, assumptions, reasons for low confidence in information (e.g. TBDC indicates data is unknown or deficient)		
	2	277 Moderate	23.9	43.1	57.6	39	Yes	
	3	277 Low	54.1	55.3	14.6	35.2	No	

9.1.2. Additional impact assessment provisions for threatened species at risk of an SAI

Euphrasia arguta (*Euphrasia arguta*)

Actions to avoid and minimise direct and indirect impacts

The following actions have been undertaken to avoid and minimise direct and indirect impacts (including mitigation measures):

- Clear physical demarcation of clearing extent
- Weed control and hygiene protocol to prevent the spread of pathogens and weeds
- Offset unavoidable clearing impacts.

Habitat for this SAI to be removed and retained is shown in Figure 9-4, Figure 9-5 and Figure 9-6.

Current status

The current status of this species can be seen in Table 9-4 below.

Table 9-4 Current status of the *Euphrasia arguta*

Criteria	Data / Information	Data sources	Details of data deficiency, assumptions, reasons for low confidence in information (e.g. TBDC indicates data is unknown or deficient)
Evidence of rapid decline (Principle 1)			
Decline in population size in NSW in the past 10 years or 3 generations (indicate whether as a direct estimate of the population or if indicated by an index or surrogate)	<i>Euphrasia arguta</i> had not been found since 1904, until it was rediscovered in Nundle State Forest in 2008. The available data does not describe the former population size or range, therefore does not allow a direct estimate of population decline. Observations have identified that the main threat to the species is road maintenance and clearing of roadside vegetation for fire breaks. Primary potential threats include browsing by domestic stock, rabbits and macropods, and land clearing.	Conservation Advice – <i>Euphrasia arguta</i> (Department of Sustainability, Environment, Water, Population and Communities, 2011)	No information detailed in TBDC.
Evidence of small population size (Principle 2)			
Current population size in NSW	16,000 individuals in a singular population.	Species Profile and Threats Database – <i>Euphrasia arguta</i> (DCCEEW, 2025)	No information detailed in TBDC.
Decline in species' population size in 3 years or one generation	There are no available data on population decline.	Species Profile and Threats Database – <i>Euphrasia arguta</i> (DCCEEW, 2025)	No information detailed in TBDC. Conservation advice indicates that there is a lack of population decline data.
Number or percentage of mature individuals in each subpopulation or	There is insufficient data on the number or percentage of mature	Conservation Advice – <i>Euphrasia arguta</i> (Department of	No information detailed in TBDC. Conservation advice lacks data on

Criteria	Data / Information	Data sources	Details of data deficiency, assumptions, reasons for low confidence in information (e.g. TBDC indicates data is unknown or deficient)
whether the species is likely to undergo extreme fluctuations	individuals. One location in Nundle State Forest identified 15,000 individuals. The species is likely to undergo extreme fluctuations due to occurrence on a cleared firebreak.	Sustainability, Environment, Water, Population and Communities, 2011) Species Profile and Threats Database – <i>Euphrasia arguta</i> (DCCEEW, 2025)	number or percentage of mature individuals in each subpopulation.
Evidence of limited geographic range (Principle 3)			
Extent of occurrence (ha)	2600	Species Profile and Threats Database – <i>Euphrasia arguta</i> (DCCEEW, 2025)	TBDC details < 100,000 ha (OEH, 2025).
Area of occupancy (ha)	3	Species Profile and Threats Database – <i>Euphrasia arguta</i> (DCCEEW, 2025)	TBDC details < 10,000 ha (OEH, 2025).
Number of threat-defined locations	The singular known population occurs in Nundle State Forest, subject to disturbance including road maintenance and clearing of roadside vegetation for fire breaks. For the purposes of this assessment, it is assumed Nundle State Forest is a threat-defined.	Species Profile and Threats Database – <i>Euphrasia arguta</i> (DCCEEW, 2025)	No information detailed in TBDC.
Whether the species' population is likely to undergo extreme fluctuations	Unknown	N/A	Insufficient data in the Conservation Advice and TBDC.

Impact assessment

Impact assessment of this species can be seen below in Table 9-5.

Table 9-5 Impact assessment of the *Euphrasia arguta*

Impact	Data / Information	Data sources	Details of data deficiency, assumptions or reasons for low confidence in information (e.g. TBDC indicates data is unknown or deficient)
Number of individuals (mature and immature) present in the subpopulation on the Subject Land	Unknown	N/A	No information detailed in TBDC. This species is assumed present within the Subject Land, therefore, the number of individuals is unknown.
Number of individuals (mature and immature) present as a percentage of total NSW population (%)	Unknown	N/A	No information detailed in TBDC. The percentage of the total NSW population cannot be calculated as the number of individuals in NSW and in the Subject Land is unknown.
Number of individuals (mature and immature) to be impacted by the proposal	Unknown	N/A	No information detailed in TBDC. The percentage of the total NSW population cannot be calculated as the number of individuals in NSW and in the Subject Land is unknown.
Individuals (mature and immature) to be impacted by the proposal as a percentage of total NSW population (%)	Unknown	N/A	No information detailed in TBDC. The percentage of the total NSW population cannot be calculated as the number of individuals in NSW and in the Subject Land is unknown.
Area of habitat to be impacted (ha) (for species measured by area only)	2.00 ha of potential habitat would be directly impacted by the Development	Calculated by GIS, satellite imagery and data collecting during field	Presence assumed.

Impact	Data / Information	Data sources	Details of data deficiency, assumptions or reasons for low confidence in information (e.g. TBDC indicates data is unknown or deficient)
	Footprint as a result of assumed presence.	investigations.	
Area of the species' geographic range to be impacted by the proposal (ha)	The species' geographic range does not occur within the Subject Land.	Species Profile and Threats Database – <i>Euphrasia arguta</i> (DCCEEW, 2025)	-
Area of the species' geographic range to be impacted as a percentage of the total area or extent of occupancy (%)	The species' geographic range does not occur within the Subject Land.	Species Profile and Threats Database – <i>Euphrasia arguta</i> (DCCEEW, 2025)	-
Individuals impacted	No individuals will be directly impacted, some habitat will be impacted	N/A	-
Viability of a fragmented population (see below)	The proposal would not fragment the existing population as the species' geographic distribution is outside the Subject Land and where species habitat may occur.	Species Profile and Threats Database – <i>Euphrasia arguta</i> (DCCEEW, 2025)	No information detailed in TBDC.



Figure 9-1 Box-Gum Woodland (SAIL entity) to be retained and removed – Map 1 of 3 (NGH, 2025)



Figure 9-2 Box-Gum Woodland (SAIL entity) to be retained and removed - Map 2 of 3 (NGH, 2025)



Figure 9-3 Box-Gum Woodland (SAIL entity) to be retained and removed - Map 3 of 3 (NGH, 2025)



Figure 9-4 Euphrasia arguta (SAIL entities) habitat to be retained and removed – Map 1 of 3 (NGH, 2025)

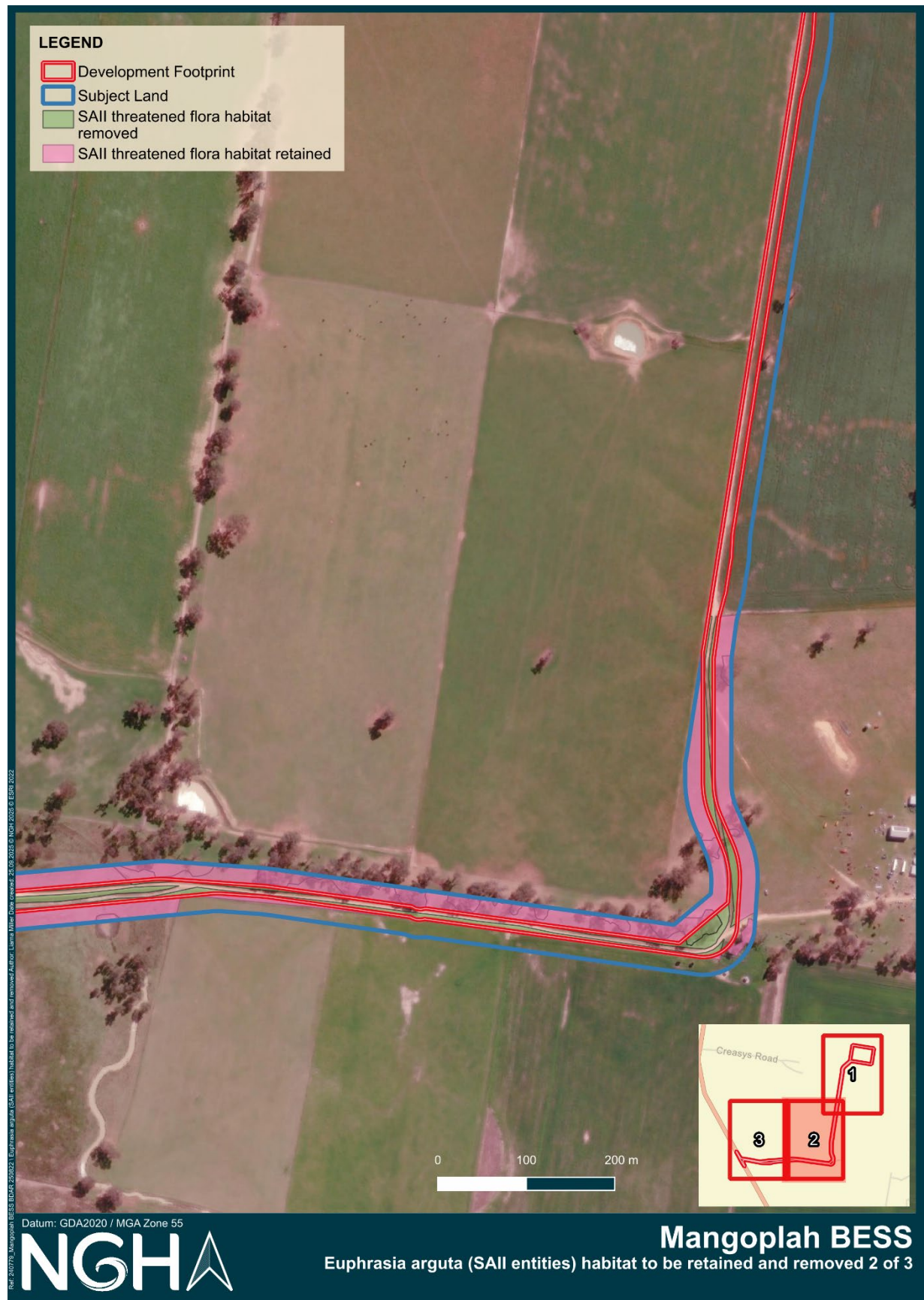


Figure 9-5 Euphrasia arguta(SAIL entities) habitat to be retained and removed – Map 2 of 3 (NGH, 2025)

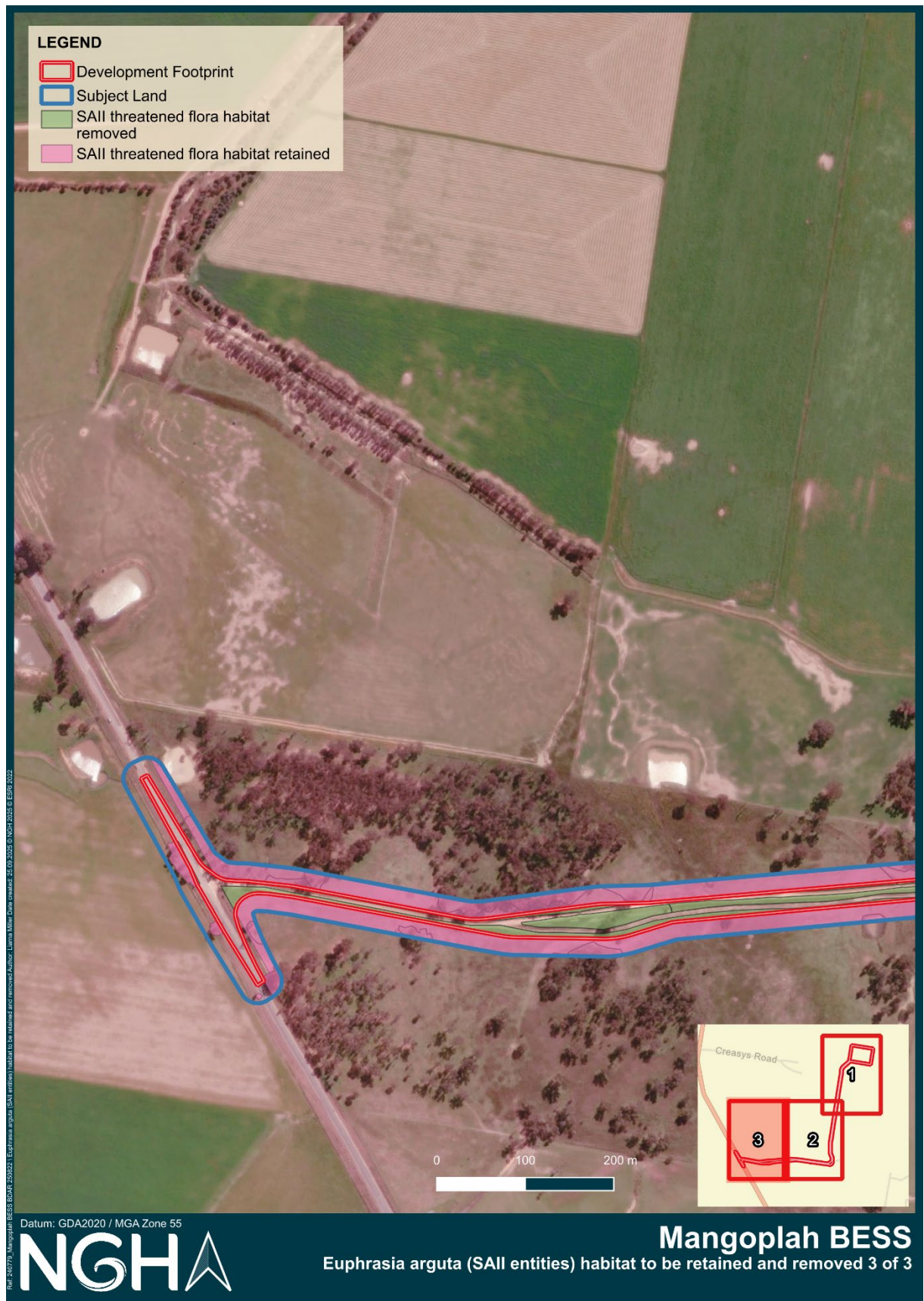


Figure 9-6 Euphrasia arguta (SAIL entities) habitat to be retained and removed – Map 3 of 3 (NGH, 2025)

10. Impact summary

10.1. Determine an offset requirement for impacts

Areas that do or do not require an offset are shown in Figure 10-1, Figure 10-2 and Figure 10-3.

10.1.1. Impacts on native vegetation and TECs or ECs (ecosystem credits)

An offset is required for all impacts of development on PCTs that are associated with:

- a) A vegetation zone that has a vegetation integrity score ≥ 15 where the PCT is representative of an endangered or critically endangered ecological community, or
- b) A vegetation zone that has a vegetation integrity score of ≥ 17 where the PCT is associated with threatened species habitat (as represented by ecosystem credits), or is representative of a vulnerable ecological community, or
- c) A vegetation zone that has a vegetation integrity score ≥ 20 where the PCT is not representative of a TEC or associated with threatened species habitat.

The PCTs and vegetation zones requiring offset, and the ecosystem credits required, are documented in Table 10-1. All native vegetation zones and TECs require an offset, shown in Figure 10-4, Figure 10-5 and Figure 10-6.

Table 10-1 Impacts that require an offset - ecosystem credits

Vegetation zone	PCT name	TEC	Impact area (ha)	Current VI score	Future VI score	Change in VI score	Biodiversity risk weighting	No. ecosystem credits required
VZ1 277 Good	Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	<i>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</i>	0.22	54.6	0	-54.6	2	8
VZ2 277 Moderate	Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	<i>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</i>	0.13	39	0	-39	2	3
VZ3 277 Low	Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	<i>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</i>	1.50	35.2	0	-35.2	2	33

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Vegetation zone	PCT name	TEC	Impact area (ha)	Current VI score	Future VI score	Change in VI score	Biodiversity risk weighting	No. ecosystem credits required
		<i>Western Slopes, South East Corner and Riverina Bioregions</i>						
VZ4 76 Low	Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	<i>Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia</i>	0.15	28.3	0	-28.3	1.5	2
Total credits								46

10.1.2. Impacts on threatened species and their habitat (species credits)

The BAM credit calculator generated offset obligations for ten species credit species and their habitat. Impacts on threatened species and their habitat are documented in Table 10-2 and require an offset. Figure 10-4, Figure 10-5 and Figure 10-6 show the areas where threatened flora species impact areas occur and where species credits are required. Threatened fauna species impact areas where species credits are required are shown in Figure 10-7, Figure 10-8 and Figure 10-9.

Table 10-2 Impacts that require an offset - species credits

Common name Scientific name	BC Act status	EPBC Act status	Loss of habitat (ha) or individuals	Biodiversity risk weighting	No. of species credits required	Suitable IBRA subregion for offset
Flora						
A Spear-grass <i>Austrostipa wakoolica</i>	E	E	2.00 ha (assumed present)	High (2)	36	Any in NSW
Euphrasia arguta <i>Euphrasia arguta</i>	V	Not Listed	2.00 ha (assumed present)	Very High (3)	56	Any in NSW
Yass Daisy <i>Ammobium craspedioides</i>	E	Not Listed	40 individuals (assumed present)	High (2)	80	Any in NSW
Fauna						
Barking Owl <i>Ninox connivens</i>	V	Not Listed	0.23 ha	High (2)	7	Any in NSW
Golden Sun Moth <i>Synemon plana</i>	V	V	2.00 ha (assumed present)	Moderate (1.5)	29	Any in NSW
Masked Owl <i>Tyto novaehollandiae</i>	V	Not Listed	0.23 ha	High (2)	7	Any in NSW
Southern Myotis <i>Myotis macropus</i>	V	Not Listed	1.00 ha	High (2)	18	Any in NSW
Squirrel Glider <i>Petaurus norfolcensis</i>	V	Not Listed	0.05 ha	High (2)	1	Any in NSW
Squirrel Glider in the Wagga Wagga Local Government Area <i>Petaurus norfolcensis</i> – endangered population	Endangered Population	Not Listed	0.05 ha	High (2)	1	Any in NSW

Common name <i>Scientific name</i>	BC Act status	EPBC Act status	Loss of habitat (ha) or individuals	Biodiversity risk weighting	No. of species credits required	Suitable IBRA subregion for offset
Striped Legless Lizard <i>Delma impar</i>	V	V	2.00 ha (assumed present)	Moderate (1.5)	29	Any in NSW
Total credits					264	

10.1.3. Indirect and prescribed impacts

No indirect or prescribed impacts remain after measures to avoid, minimise and mitigate have been implemented.

10.1.4. Offsets required under the EPBC Act

Assessments of Significance (AoSs) were undertaken for the following EPBC Act listed species and communities:

TEC

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

Flora

- A Spear-grass (*Austrostipa wakoolica*)
- Euphrasia arguta (*Euphrasia arguta*)
- Yass Daisy (*Ammobium craspedioides*).

Fauna

- Brown Treecreeper (eastern subspecies) (*Climacteris picumnus victoriae*)
- Corben's Long-Eared Bat (*Nyctophilus corbeni*)
- Diamond Firetail (*Stagonopleura guttata*)
- Fork-tailed Swift (*Apus pacificus*)
- Golden Sun Moth (*Synemon plana*)
- ()Regent Honeyeater (*Anthochaera phrygia*)
- South-eastern Hooded Robin (*Melanodryas cucullata cucullata*)
- Striped Legless Lizard (*Delma impar*)
- ()Swift Parrot (*Lathamus discolor*)
- White-throated Needletail (*Hirundapus caudacutus*)
- Yellow Wagtail (*Motacilla flava*).

The AoSs for each entity are provided in Appendix B. With the implementation of mitigation measures, the proposal is unlikely to lead to a significant impact. The project was not determined to be a controlled action by the Department of Climate Change, Energy, the Environment and Water (Cth) (DCCEEW).

10.2. Impacts that do not require further assessment

Areas not requiring assessment were identified in accordance with BAM Section 9.3. These areas of impact are detailed in Table 10-3 below.

Table 10-3 Impacts that do not need further assessment for ecosystem credits

Impact	Location within Subject Land	Justification why no further assessment is required
Non-native vegetation	Adjacent to the existing access track and at the BESS site.	No native vegetation. Assessed for prescribed impacts only.

Impact	Location within Subject Land	Justification why no further assessment is required
Infrastructure (roads)	Existing access track and Holbrook Road.	No native vegetation. Assessed for prescribed impacts only.



Figure 10-1 Areas requiring and not requiring an offset – Map 1 of 3 (NGH, 2025)

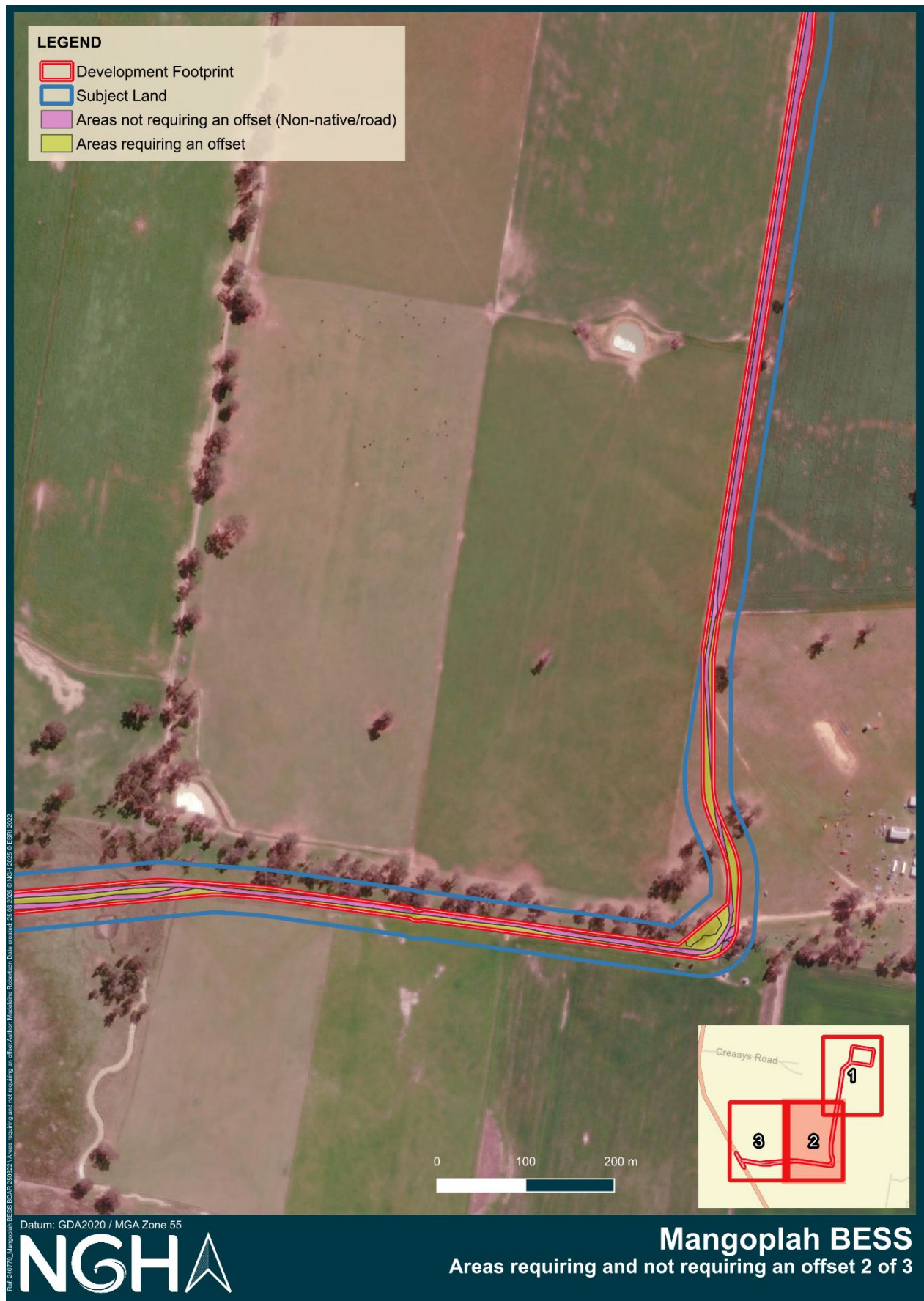


Figure 10-2 Areas requiring and not requiring an offset – Map 2 of 3 (NGH, 2025)

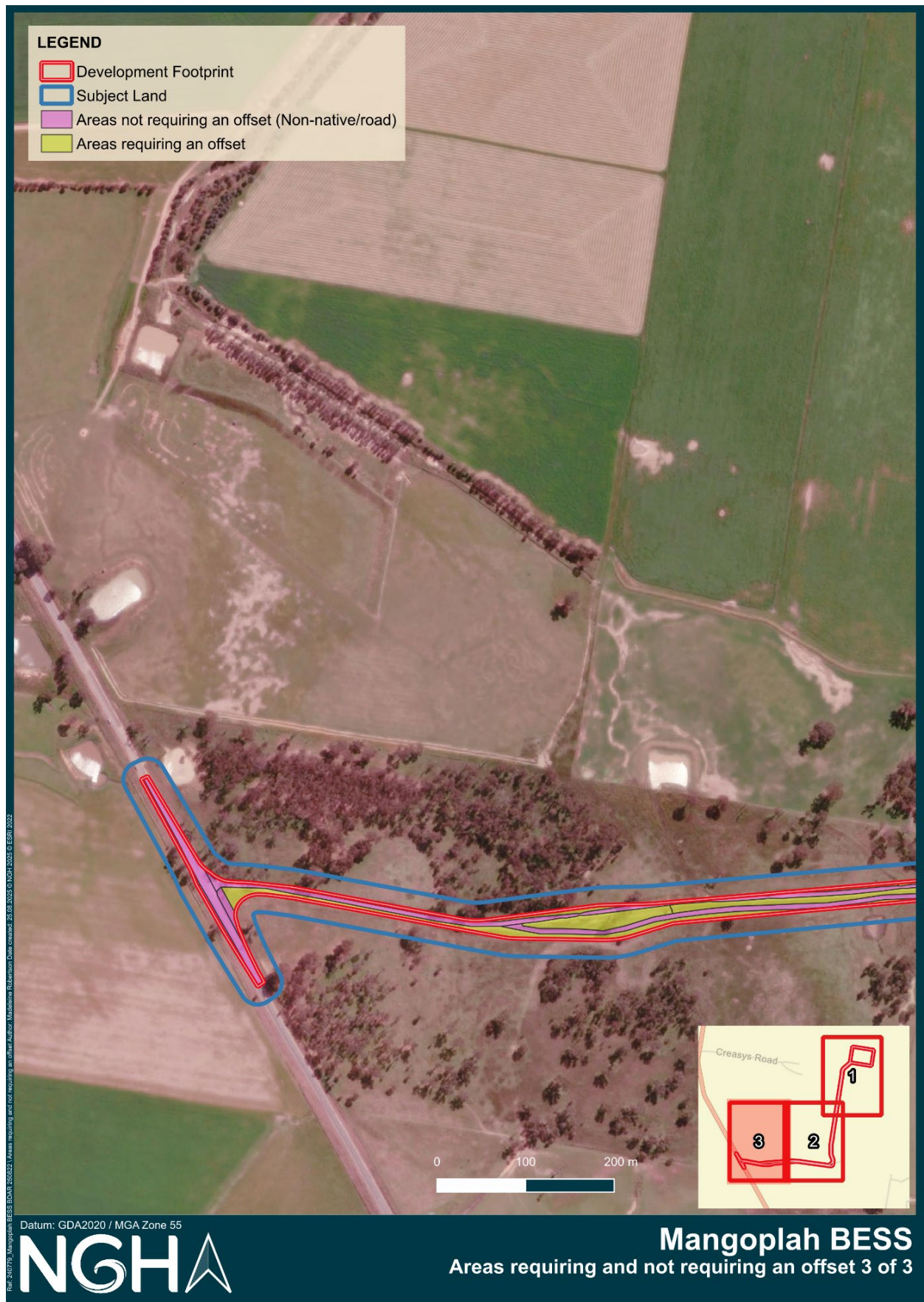


Figure 10-3 Areas requiring and not requiring an offset – Map 3 of 3 (NGH, 2025)



Figure 10-4 Ecosystem offsets - Map 1 of 3 (NGH, 2025)

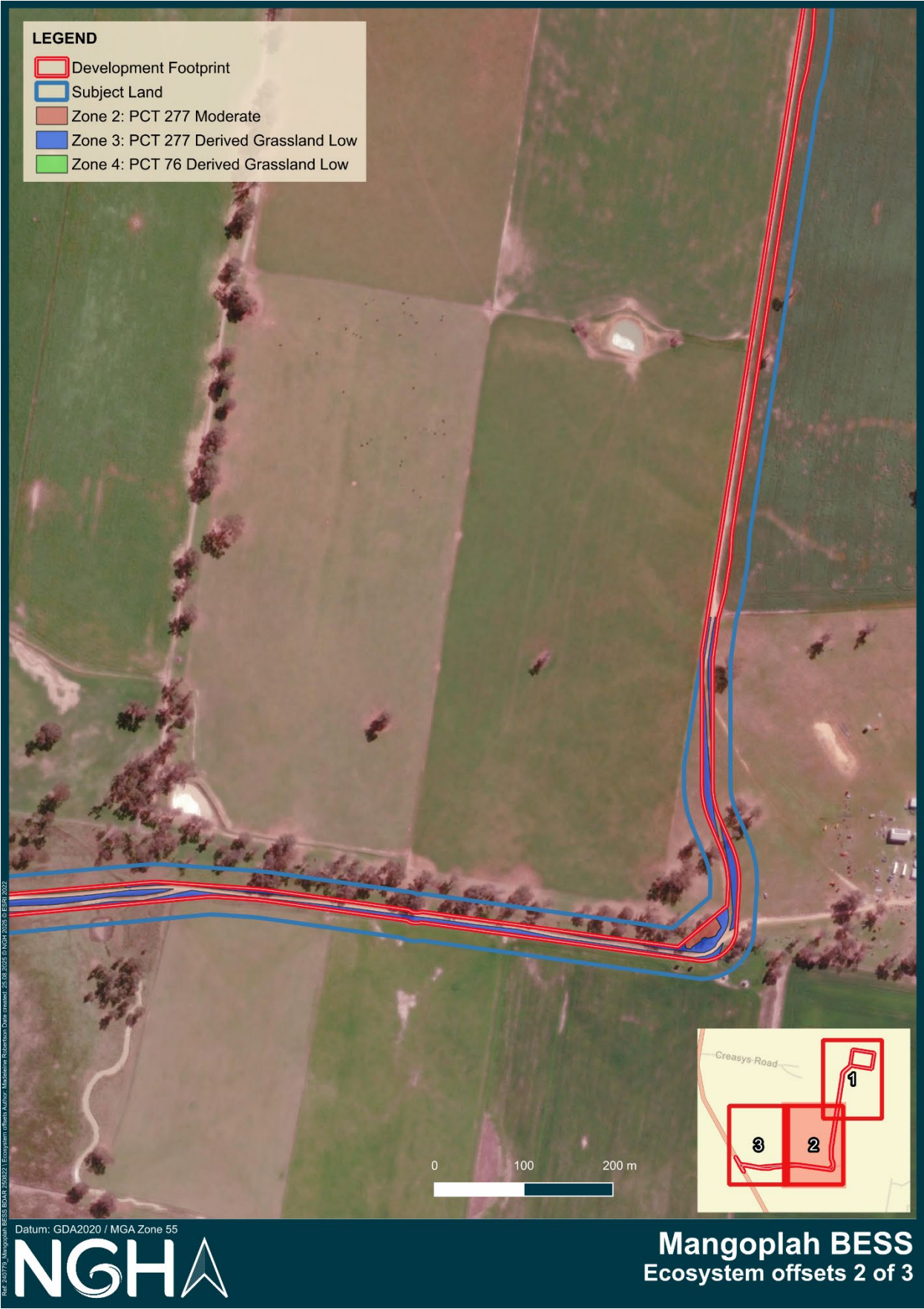


Figure 10-5 Ecosystem offsets - Map 2 of 3 (NGH, 2025)

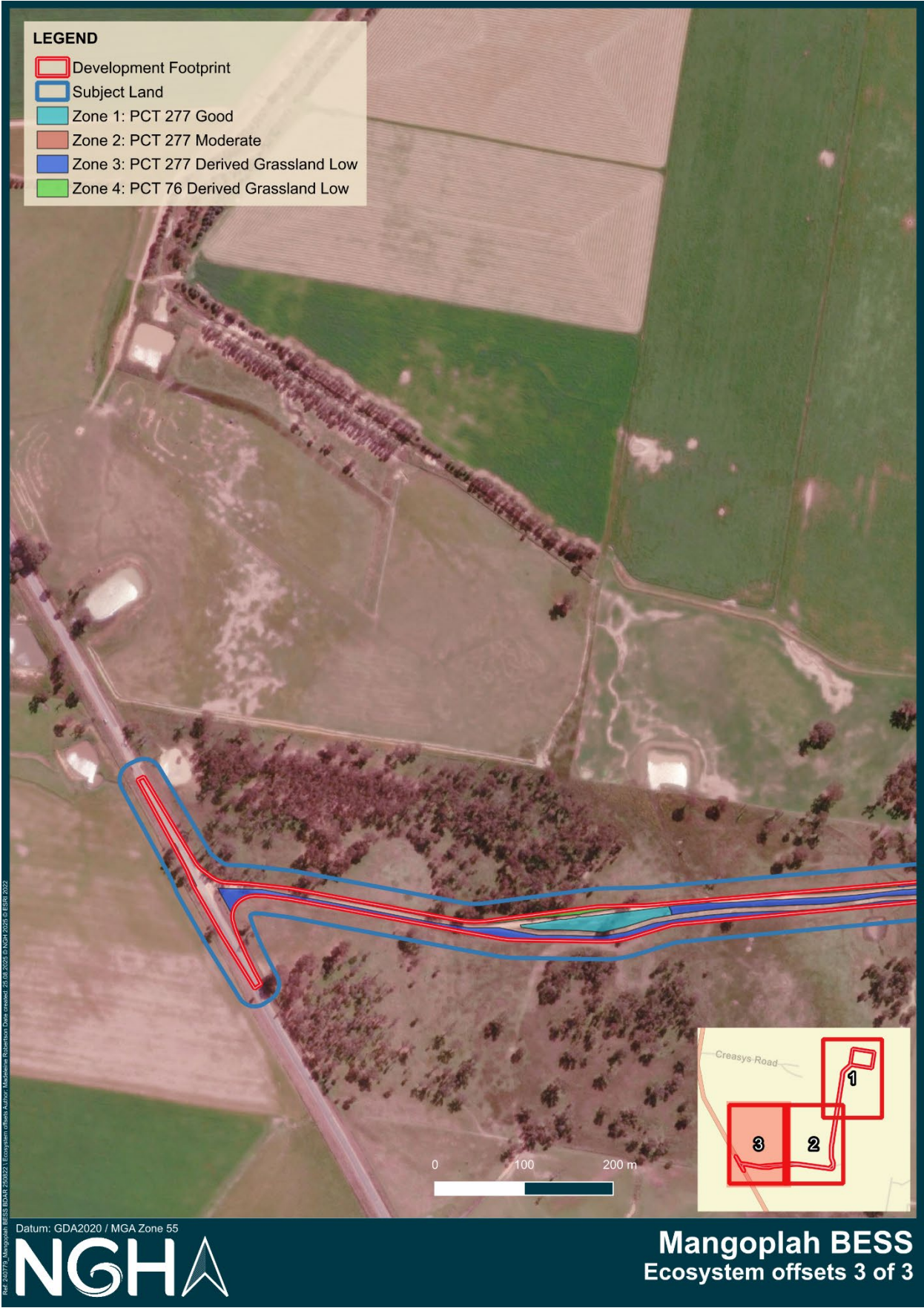


Figure 10-6 Ecosystem offsets - Map 3 of 3 (NGH, 2025)

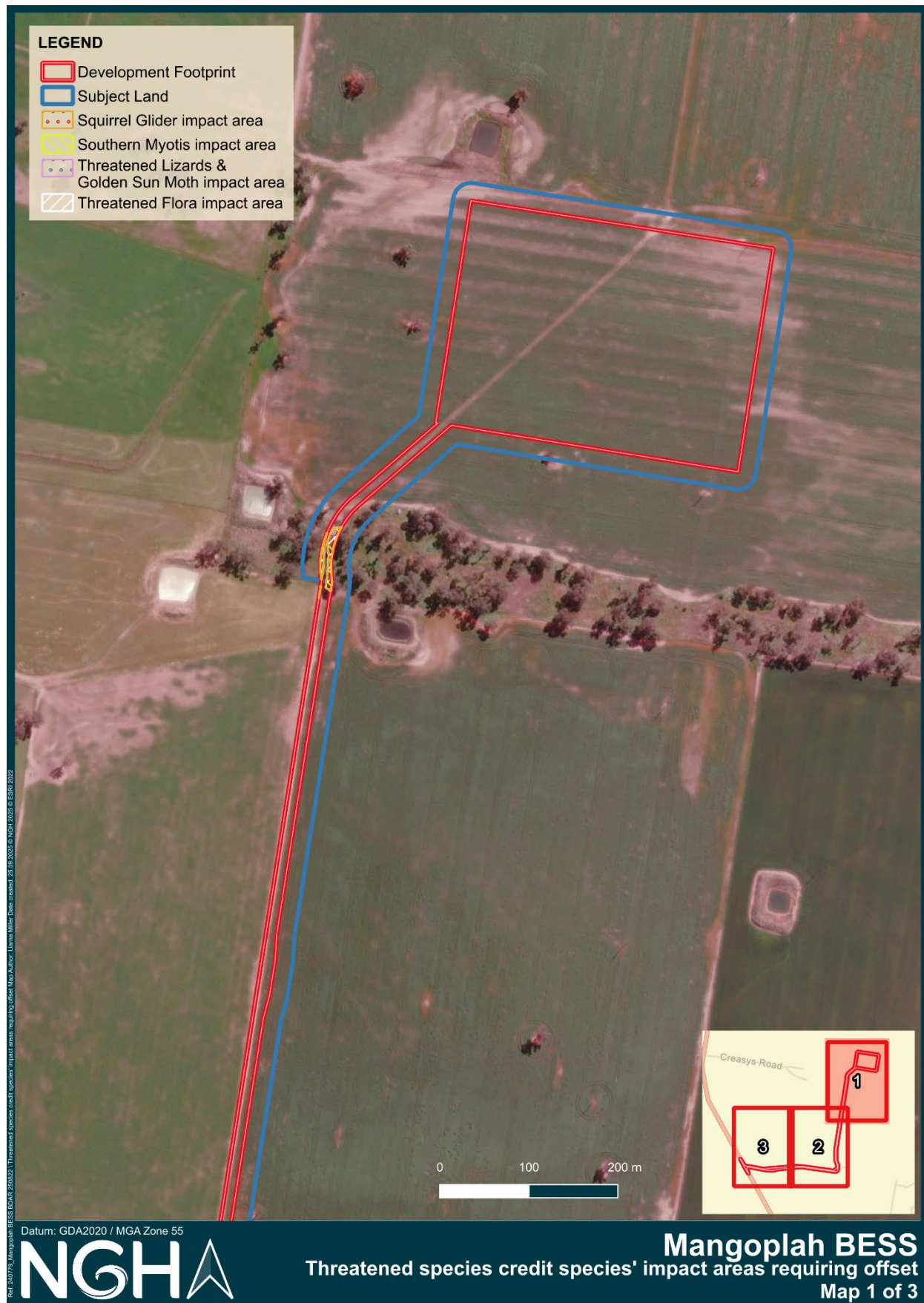


Figure 10-7 Threatened species credit species' impact areas requiring offsets - Map 1 of 3 (NGH, 2025)

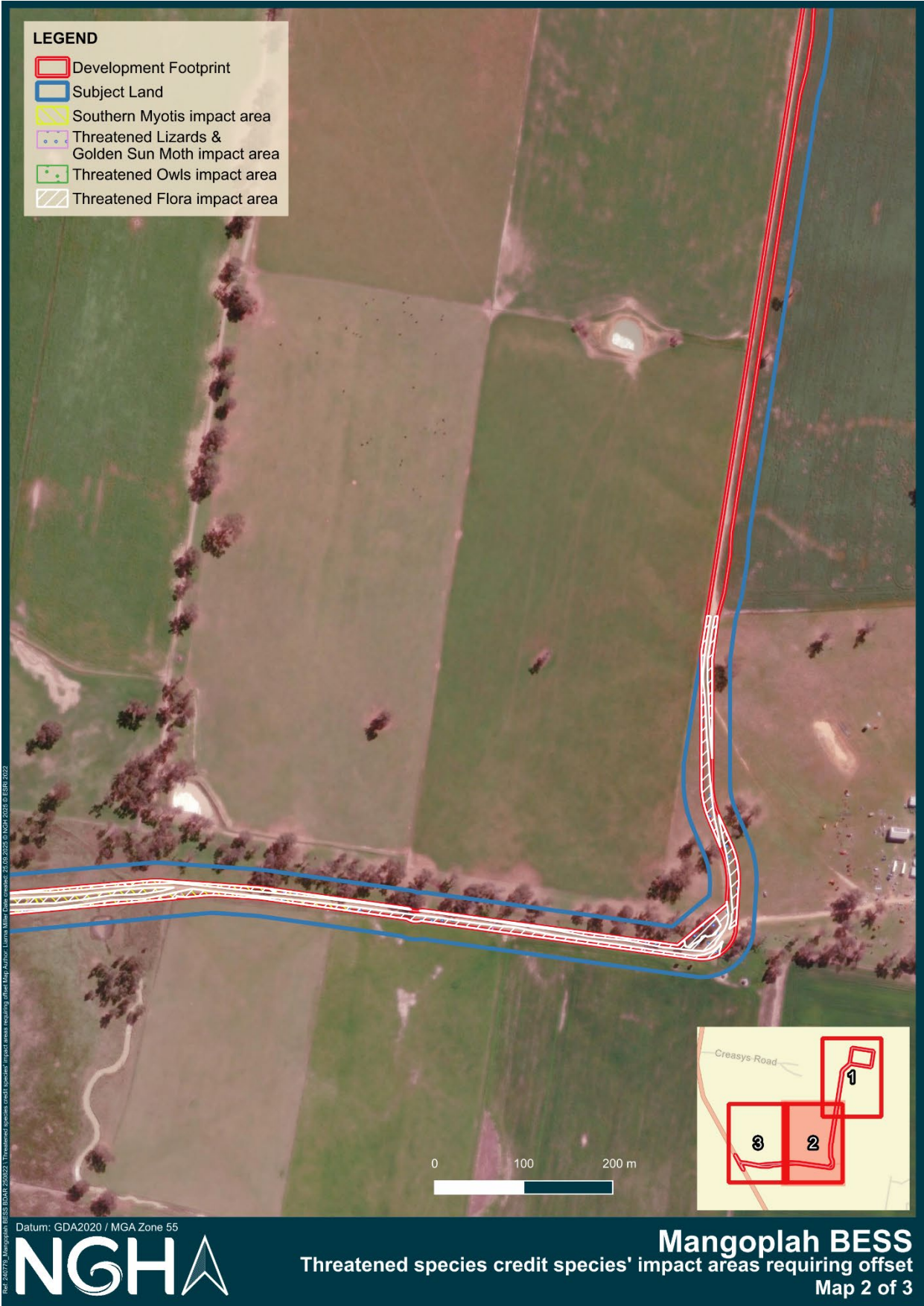


Figure 10-8 Threatened species credit species' impact areas requiring offsets - Map 2 of 3 (NGH, 2025)

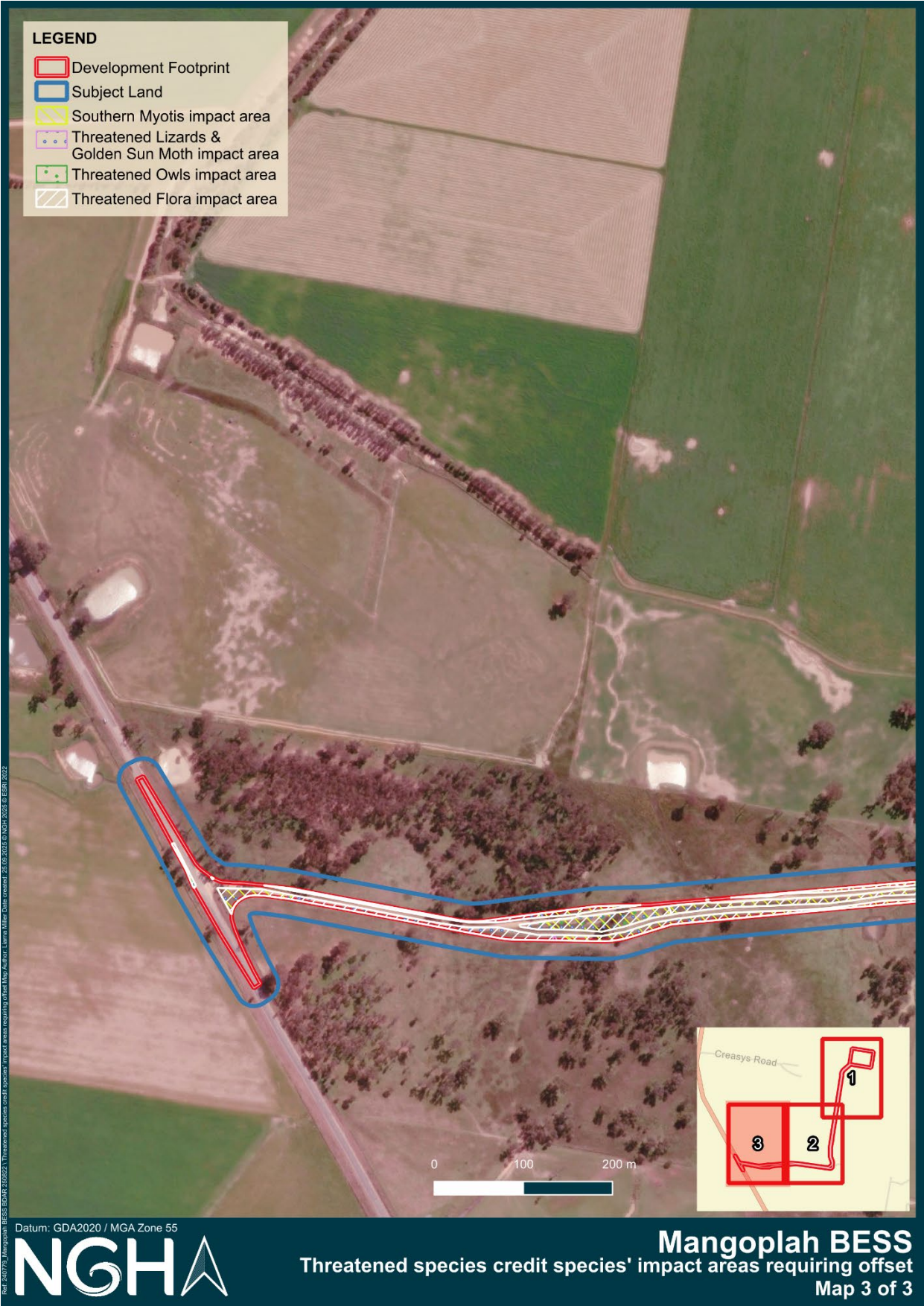


Figure 10-9 Threatened species credit species' impact areas requiring offsets - Map 3 of 3 (NGH, 2025)

11. Biodiversity credit report

11.1. Ecosystem credits

Information regarding ecosystem credit requirements for the proposed development are detailed in Table 11-1 below.

Table 11-1 Ecosystem credit class and matching credit profile

Ecosystem credit	Attributes shared with matching credits							Ecosystem credits required
	PCT name	PCT vegetation class	PCT vegetation information	Associated TEC or EC	Offset trading group (BAM Section 10.2, Tables 4 & 5)	Hollow bearing trees present?	IBRA subregion	
Zone 1 277 Good	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 Riverina Bioregions	Western Slopes Grassy Woodlands	EPBC Act: <i>White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland</i> BC Act: <i>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</i>	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,	Yes	NSW South Western Slopes	8

Ecosystem credit	Attributes shared with matching credits							Ecosystem credits required
	PCT name	PCT vegetation class	PCT vegetation formation	Associated TEC or EC	Offset trading group (BAM Section 10.2, Tables 4 & 5)	Hollow bearing trees present ?	IBRA subregion	
					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			
Zone 2 277 Moderate	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 Riverina Bioregions	Western Slopes Grassy Woodlands	EPBC Act: <i>White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland</i> BC Act: <i>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</i>	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,	Yes	NSW South Western Slopes	3

Ecosystem credit	Attributes shared with matching credits							Ecosystem credits required
	PCT name	PCT vegetation class	PCT vegetation formation	Associated TEC or EC	Offset trading group (BAM Section 10.2, Tables 4 & 5)	Hollow bearing trees present ?	IBRA subregion	
					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			

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Ecosystem credit	Attributes shared with matching credits							Ecosystem credits required
	PCT name	PCT vegetation class	PCT vegetation formation	Associated TEC or EC	Offset trading group (BAM Section 10.2, Tables 4 & 5)	Hollow bearing trees present ?	IBRA subregion	
Zone 3 277 Low	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 Riverina Bioregions	Western Slopes Grassy Woodlands	EPBC Act: <i>White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland</i> BC Act: <i>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</i>	This includes PCTs: 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	No	NSW South Western Slopes	33
Zone 4 76	Western Grey Box	Grey Box (Eucalyptus	Floodplain Transition	EPBC Act:	This includes PCTs:	No	NSW South	2

Ecosystem credit	Attributes shared with matching credits							Ecosystem credits required
	PCT name	PCT vegetation class	PCT vegetation formation	Associated TEC or EC	Offset trading group (BAM Section 10.2, Tables 4 & 5)	Hollow bearing trees present ?	IBRA subregion	
Low	tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Woodlands	<i>Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia</i> BC Act: <i>Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions</i>	76, 80, 81, 82, 110, 237, 248, 250, 267, 3405		Western Slopes	

11.2. Species credits

Information regarding species credit requirements for the proposed development are detailed in Table 11-2 below.

Table 11-2 Species credit class and matching credit profile

Species credit	Attributes shared with matching credits				Species credits required
	Kingdom	BC Act status	EPBC Act status	IBRA region	
<i>Ammobium craspedioides</i> Yass Daisy	Plantae	Vulnerable	Vulnerable	Any in NSW	80
<i>Austrostipa wakoolica</i> A spear-grass	Plantae	Endangered	Endangered	Any in NSW	36

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Species credit	Attributes shared with matching credits				Species credits required
	Kingdom	BC Act status	EPBC Act status	IBRA region	
<i>Delma impar</i> Striped Legless Lizard	Animalia	Vulnerable	Vulnerable	Any in NSW	29
<i>Euphrasia arguta</i> Eyebright	Plantae	Critically Endangered	Critically Endangered	Any in NSW	56
<i>Myotis Macropus</i> Southern Myotis	Animalia	Vulnerable	Not Listed	Any in NSW	18
<i>Ninox connivens</i> Barking Owl	Animalia	Vulnerable	Not Listed	Any in NSW	7
<i>Petaurus norfolcensis</i> Squirrel Glider	Animalia	Vulnerable	Not Listed	Any in NSW	1
<i>Petaurus norfolcensis</i> – <i>endangered population</i> Squirrel Glider in the Wagga Wagga Local Government Area	Animalia	Endangered Population	Not Listed	Any in NSW	1
<i>Synemon plana</i> Golden Sun Moth	Animalia	Vulnerable	Vulnerable	Any in NSW	29
<i>Tyto novaehollandiae</i> Masked Owl	Animalia	Vulnerable	Not Listed	Any in NSW	7

12. Conclusion

NGH has prepared this BDAR on behalf of SREA to assess the biodiversity impacts of the proposal using the Biodiversity Assessment Method (BAM, 2020) as required under the *Biodiversity Conservation Act 2016*. The Mangoplah BESS proposal is classified as a SSD as detailed in the *Planning Systems SEPP* (2021). In this BDAR, biodiversity impacts have been assessed through comprehensive mapping and assessment completed in accordance with the BAM (2020). Using state vegetation mapping and on-ground vegetation stratification, two PCTs were identified within the Subject Land, both of which occur within the Development Footprint:

- PCT 76 *Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions*.
- PCT 277 *Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion*.

Four TECs were identified within the Subject Land, including:

- *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia (Grey Box Woodland)* – Endangered under the EPBC Act.
- *Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions (Inland Grey Box Woodland)* – Endangered under the BC Act.
- *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Box-Gum Woodland)* – Critically Endangered under the EPBC Act.
- *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 (Box-Gum Woodland)* – Critically Endangered under the BC Act.

A total of 25 hollow-bearing trees and three scattered trees were identified within the Subject Land and access road. Five HBTs are proposed to be removed from the Development Footprint, while 20 would be avoided and retained within the Subject Land.

Impacts have been avoided, minimised or offset through the following:

- Site selection of the proposed BESS location, which has historically been cleared for cropping, and comprised of exotic vegetation. Through selecting this site, biodiversity loss has been minimised, thereby reducing potential impacts on native ecosystems.
- Utilising an existing access track, with small sections proposed to be widened. This has minimised disturbance to the surrounding environment by utilising what is currently available. Multiple iterations to the access track design has occurred to avoid as much clearing of native vegetation as possible.
- To compensate for the clearing of Box-Gum Woodland, offsets are required and credits will be retired.

Based on the above, the credit requirement for the Mangoplah BESS has been defined in Table 12-1 and Table 12-2. Mitigation measures have been outlined to reduce the direct, indirect, and prescribed impacts to biodiversity. The credits will be retired in accordance with the Biodiversity Offset Scheme.

Table 12-1 Ecosystem credit requirement

Zone ID	PCT ID	PCT name	TEC name	Zone area (ha)	Vegetation integrity score	Ecosystem credits required
1	277_Woodl and_Good	<i>Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion</i>	<i>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</i>	0.22	54.6	8
2	277_Woodl and_Moder ate	<i>Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion</i>	<i>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</i>	0.13	39	3
3	277_Degra ded Grassland_ Low	<i>Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion</i>	<i>White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow</i>	1.50	35.2	33

Zone ID	PCT ID	PCT name	TEC name	Zone area (ha)	Vegetation integrity score	Ecosystem credits required
			<i>Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions</i>			
4	76_Grassland_Low	<i>Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions</i>	<i>Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions</i>	0.15	28.3	2

Table 12-2 Species credit requirement

Species credit species	Impact area (ha)	BC Act listing	EPBC Act listing	Number of credits required
Flora				
A spear-grass <i>Austrostipa wakoolica</i>	2.00	Endangered	Endangered	36
Euphrasia arguta <i>Euphrasia arguta</i>	2.00	Critically Endangered	Critically Endangered	56
Yass Daisy <i>Ammobium craspedioides</i>	40 individuals	Vulnerable	Vulnerable	80
Fauna				
Barking Owl <i>Ninox connivens</i>	0.23	Vulnerable	Not Listed	7
Golden Sun Moth <i>Synemon plana</i>	2.00	Vulnerable	Vulnerable	29
Masked Owl <i>Tyto novaehollandiae</i>	0.23	Vulnerable	Not Listed	7
Southern Myotis <i>Myotis Macropus</i>	1.00	Vulnerable	Not Listed	18

Species credit species	Impact area (ha)	BC Act listing	EPBC Act listing	Number of credits required
Squirrel Glider <i>Petaurus norfolcensis</i>	0.05	Vulnerable	Not Listed	1
Squirrel Glider in the Wagga Wagga Local Government Area <i>Petaurus norfolcensis</i> – endangered population	0.05	Endangered Population	Not Listed	1
Striped Legless Lizard <i>Delma impar</i>	2.00	Vulnerable	Vulnerable	29

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Appendix A BDAR requirements compliance

Table 13-1 Assessment of compliance with BDAR minimum information requirements

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
Introduction	Chapters 2 and 3	Information	
		Introduction to the biodiversity assessment including:	–
		☒ brief description of the proposal	1.1
		☒ identification of subject land boundary, including:	1.1
		☒ operational footprint	
		☒ construction footprint indicating clearing associated with temporary/ancillary construction facilities and infrastructure	
		☒ general description of the subject land	1.1.3
		☒ sources of information used in the assessment, including reports and spatial data	1.5
		☒ identification and justification for entering the BOS	1.2
		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 1-1
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	1.1.3
		☒ per cent native vegetation cover in the assessment area (as described in BAM Section 3.2)	2.1.2
		☒ IBRA bioregions and subregions (as described in BAM Subsection 3.1.3(2.))	3.2.1
		☒ rivers and streams classified according to stream order (as described in BAM Subsection	3.2.2

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BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		3.1.3(3.) and Appendix E)	
		☒ wetlands within, adjacent to and downstream of the site (as described in BAM Subsection 3.1.3(3.))	3.2.2
		☒ connectivity of different areas of habitat (as described in BAM Subsection 3.1.3(5–6.))	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.))	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.))	3.2.5
		☒ any additional landscape features identified in any SEARs for the proposal	3.2.7
		☒ NSW (Mitchell) landscape on which the subject land occurs	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)	2.1
		Maps and tables	
		☒ Site Map	Figure 1-1 Figure 3-4
		☒ 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	
		☒ Location Map	Figure 3-4
		☒ 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)	
		☒ 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:	–

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BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		☒ IBRA bioregions and subregions ☒ 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	Figure 3-3 Figure 3-4
		Data	
		☒ All report maps as separate jpeg files	–
		Individual digital shape files of:	–
		☒ subject land boundary	–
		☒ assessment area (i.e. subject land and 1500 m buffer area) boundary	–
		☒ cadastral boundary of subject land	–
		☒ areas of native vegetation cover	–
		☒ landscape features	–
Native vegetation	Chapter 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)	4.1
		☒ Provide justification for all parts of the subject land that do not contain native vegetation (as described in BAM Subsection 4.1.2)	4.1.2
		☒ 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	2.2.1 2.2.2

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BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		Subsection 4.1.1)	
		☒ Describe the systematic field-based floristic vegetation survey undertaken in accordance with BAM Section 4.2	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)	-
		For each PCT within the subject land, describe:	–
		☒ PCT name and ID	4.2.2 4.2.3
		☒ vegetation class	4.2.2 4.2.3
		☒ extent (ha) within subject land	4.2.2 4.2.3
		☒ evidence used to identify a PCT including any analyses undertaken, references/sources, existing vegetation maps (BAM Section 4.2(1–3.))	4.2.2 4.2.3
		☒ plant species relied upon for identification of the PCT and relative abundance of each species	4.2.2 4.2.3
		☒ if relevant, TEC status including evidence used to determine vegetation is the TEC (BAM Subsection 4.2.2(1–2.))	4.4
		☒ estimate of per cent cleared value of PCT (BAM Subsection 4.2.1(5.))	4.2
		Describe the vegetation integrity assessment of the subject land, including:	–
		☒ identification and mapping of vegetation zones (as described in BAM Subsection 4.3.1)	4.3 Figure 4-11 Figure 4-12 Figure 4-13
		☒ description of vegetation zones within the subject land (as described in Operational Manual Stage 1 Table 2 and Subsection 3.3.2)	4.3
		☒ area (ha) of each vegetation zone	4.3

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BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		☒ assessment of patch size (as described in BAM Subsection 4.3.2)	4.3
		☒ survey effort (i.e. number of vegetation integrity survey plots) as described in BAM Subsection 4.3.4(1–2.)	4.7.1
		☒ use of relevant benchmark data from BioNet Vegetation Classification (as described in BAM Subsection 4.3.3(5.))	4.7.3
		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	4.7.3
		☒ 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	4.7.3
		☒ provide written confirmation from the decision-maker that they support the use of local benchmark data	4.7.3
		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 4-8 Figure 4-9 Figure 4-10
		☒ Map of PCTs within the subject land (as described in BAM Section 4.2(1.))	Figure 4-8 Figure 4-9 Figure 4-10
		☒ Map of vegetation zones within the subject land (as described in BAM Subsection 4.3.1)	Figure 4-11 Figure 4-12 Figure 4-13
		☒ Map the location of floristic vegetation survey plots and vegetation integrity survey plots	Figure 4-11 Figure 4-12

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BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		relative to PCT boundaries	Figure 4-13
		☒ Map of TEC distribution on the subject land and table of TEC listing, status and area (ha)	Figure 4-11 Figure 4-12 Figure 4-13 Table 4-5
		☒ Map of patch size locations for each native vegetation zone and table of patch size areas (as described in BAM Subsection 4.3.2)	Table 4-4 Figure 4-11 Figure 4-12 Figure 4-13
		Table of current vegetation integrity scores for each vegetation zone within the site and including:	–
		☒ composition condition score	Table 4-11
		☒ structure condition score	
		☒ function condition score	
		☒ presence of hollow bearing trees	
		Data	
		☒ All report maps as separate jpeg files	–
		☒ Plot field data (MS Excel format)	Appendix D
		☒ Plot field datasheets	Appendix D
		Digital shape files of:	–
		☒ PCT boundaries within subject land	–
		☒ TEC boundaries within subject land	–
		☒ vegetation zone boundaries within subject land	–
		☒ floristic vegetation survey and vegetation integrity plot locations	–
Threatened species	Chapter 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.))	5.1.2

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BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		☒ 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)	5.1.2
		☒ justification for addition of any ecosystem credit species to the list	5.1.2
		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)	5.1.3
		☒ 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)	5.1.3
		☒ 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)	5.1.3
		☒ justification for addition of any species credit species to the list	5.1.3
		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.))	Table 5-2 Table 5-3
		☒ 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.))	
		Present the outcomes of species credit species assessments from:	–
		☒ threatened species survey (as described in BAM Section 5.2.4)	Table 5-6 Table 5-7
		☒ 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)	5.4
		Where survey has been undertaken include detailed information on:	–

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BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		☒ survey method and effort (as described in BAM Section 5.3)	Table 5-6 Table 5-7
		☒ 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	5.3
		☒ 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	5.3 Table 5-6 Table 5-7
		☒ survey personnel and relevant experience	Appendix F
		☒ describe any limitations to surveys and how these were addressed/overcome	5.3
		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	5.4
		☒ 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	
		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	
		☒ provide written confirmation from the decision-maker that they support the use of local data	-
		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	Table 5-8
		for species assessed by area:	–
		☒ the polygon includes the extent of suitable habitat for the target species within the subject	Figure 5-17Figure

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		land (as described in BAM Subsection 5.2.5)	5-18 Figure 5-19Error! Reference source not found. Figure 5-20 Figure 5-21Error! Reference source not found. Figure 5-21Error! Reference source not found.
		☒ 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	5.5.1
		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.))	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	5.5.1
		☒ 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	Figure 5-17
		☒ Identify the biodiversity risk weighting for each species credit species identified as present within the subject land (as described in BAM Section 5.4)	Table 10-2
		Maps and tables	
		☒ Table showing ecosystem credit species in accordance with BAM Subsection 5.1.1, and identifying:	Table 5-1
		☒ the ecosystem credit species removed from the list	Table 5-1
		☒ the sensitivity to gain class of each species	Table 5-1
		☒ Table detailing species credit species in accordance with BAM Section 5.2 and identifying:	Table 5-2

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BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
			Table 5-3
		☒ 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 5-2 Table 5-3
		☒ the candidate species credit species not recorded on the subject land as determined by targeted survey, expert report or important habitat map	Table 5-4 Table 5-5
		☒ 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 5-8
		☒ 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 5-18 Figure 5-18 Figure 5-20 Figure 5-21 Figure 5-21
		Data	
		☒ Digital shape files of suitable habitat identified for survey for each candidate species credit species	–
		☒ Survey locations including GPS coordinates of any plots, transects, grids	Figure 5-3 Figure 5-4 Figure 5-5 Figure 5-6 Figure 5-7 Figure 5-7 Figure 5-8 Figure 5-9 Figure 5-10 Figure 5-11 Figure 5-12

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BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
			Figure 5-13 Figure 5-14 Figure 5-15 Figure 5-16
		☒ Digital shape files of each species polygon including GPS coordinates of located individuals	–
		☒ Species polygon map in jpeg format	–
		☒ Expert reports and any supporting data used to support conclusions of the expert report	Appendix D
		☒ Field datasheets detailing survey information including prevailing conditions, date, time, equipment used, etc.	Table 2-1
Prescribed impacts	Chapter 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)	Table 6-1
		☒ 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)	
		☐ 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)	N/A
		☒ 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)	Table 6-1
		☒ Identify a list of threatened entities that may be dependent upon or may use habitat features associated with any of the prescribed impacts	Table 6-1
		☒ 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)	Table 6-1 Table 8-5
		Where the proposed development is for a wind farm:	–

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BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		☐ 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)	N/A
		☐ provide details of targeted survey for candidate species of wind farm developments undertaken in accordance with BAM Subsection 6.1.5(2–3.)	N/A
		☐ 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.))	N/A
		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	Table 6-1
		Maps and tables	
		☒ Map showing location of any prescribed impact features (i.e. karst, caves, crevices, cliffs, rocks, human-made structures, etc.)	Figure 6-1
		☒ Map showing location of potential vehicle strike locations	Figure 6-1
		☐ 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)	N/A
		Data	
		☐ Digital shape files of prescribed impact feature locations	–
		☒ Prescribed impact features map in jpeg format	–
Avoid and minimise impacts	Chapter 7	Information	
		Demonstration of efforts to avoid and minimise impacts on biodiversity values (including prescribed impacts) associated with the proposal location in accordance with Chapter 7, including an analysis of alternative:	–
		☒ modes or technologies that would avoid or minimise impacts on biodiversity values and	7.1

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BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		justification for selecting the proposed mode or technology	7.2
		☒ routes that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed route	7.1 7.2
		☒ alternative locations that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed location	7.1 7.2
		☒ 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	7.1 7.2
		☒ 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)	7.1 7.2
		☒ 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.))	7
		☒ Detail measures or options considered but not implemented because they are not feasible and/or practical (e.g. due to site constraints)	7.3
		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 8-7
		☒ Map of alternative footprints considered to avoid or minimise impacts on biodiversity values; and of the final proposal footprint, including construction and operation	- 7
		☒ Maps demonstrating indirect impact zones where applicable	Figure 8-2 Figure 8-3 Figure 8-4
		Data	
		Digital shape files of:	-
		☒ alternative and final proposal footprint	-
		☒ direct and indirect impact zones	-
		☐ Maps in jpeg format	-
Assessment of impacts	Chapter 8, Sections 8.1	Information	

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BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
	and 8.2		
		☒ 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)	Table 8-1
		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	Table 8-4
		☒ documenting the consequences to vegetation and threatened species and their habitat including evidence-based justifications	8.2
		☒ reporting any limitations or assumptions, etc. made during the assessment	8.2
		☒ identification of the threatened entities and their habitat likely to be affected	8.2
		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:	–
		☒ karst, caves, crevices, cliffs, rocks and other features of geological significance	N/A
		☒ human-made structures	8.3
		☒ non-native vegetation	8.3
		☒ connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range	8.3
		☒ movement of threatened species that maintains their life cycle	8.3
		☒ water quality, waterbodies and hydrological processes that sustain threatened species and threatened ecological communities	8.3
		☐ assessment of the impacts of wind turbine strikes on protected animals	N/A
		☒ assessment of the impacts of vehicle strikes on threatened species of animals or on animals that are part of a TEC	8.3
		☒ evaluate the consequences of prescribed impacts	8.3
		☒ describe impacts that are uncertain	8.3

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BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		☒ document limitations to data, assumptions and predictions	8.3
		Maps and tables	
		☒ Table showing change in vegetation integrity score for each vegetation zone as a result of identified impacts	Table 8-2
		Data	
		N/A	–
Mitigation and management of impacts	Chapter 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	Table 8-6
		☒ identify measures for which there is risk of failure	
		☒ evaluate the risk and consequence of any residual impacts	
		☒ document any adaptive management strategy proposed	Table 8-7
		Identification of measures for mitigating impacts related to:	–
		☒ displacement of resident fauna (as described in BAM Subsection 8.4.1(2.))	8.4
		☒ 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)	
		☒ Details of the adaptive management strategy proposed to monitor and respond to impacts on biodiversity values that are uncertain (BAM Section 8.5)	Table 8-7
		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 8-6
		Data	
		N/A	–
Impact summary	Chapter 9	Information	

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BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		Identification and assessment of impacts on TECs and threatened species that are at risk of a serious and irreversible impacts (SAIL, 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 SAIL present on the subject land	9.1.1
		☒ for each TEC, report the extent of the TEC in NSW	9.1.1
		☒ addressing all criteria in Subsection 9.1.2 for each threatened species at risk of an SAIL present on the subject land	9.1.2
		☒ for each threatened species, report the population size in NSW	9.1.2
		☒ documenting assumptions made and/or limitations to information	9.1.2
		☒ documenting all sources of data, information, references used or consulted	
		☒ clearly justifying why any criteria could not be addressed	
		☒ Identification of impacts requiring offset in accordance with BAM Section 9.2	Table 10-1 Table 10-2
		☐ Identification of impacts not requiring offset in accordance with BAM Subsection 9.2.1(3.)	N/A
		☒ Identification of areas not requiring assessment in accordance with BAM Section 9.3	Table 10-3
		Maps and tables	
		☒ Map showing the extent of TECs at risk of an SAIL within the subject land	Figure 9-1
		☒ Map showing location of threatened species at risk of an SAIL within the subject land	Figure 9-4 Figure 9-5 Figure 9-6
		Map showing location of:	–
		☒ impacts requiring offset	Figure 10-1 Figure 10-2 Figure 10-3
		☒ impacts not requiring offset	Figure 10-1 Figure 10-2 Figure 10-3
		☐ areas not requiring assessment	N/A

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BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		Data	
		Digital shape files of:	–
		☒ extent of TECs at risk of an SAI within the subject land	–
		☒ location of threatened species at risk of an SAI within the subject land	–
		☒ boundary of impacts requiring offset	–
		☒ boundary of impacts not requiring offset	–
		☒ boundary of areas not requiring assessment	–
		☒ Maps in jpeg format	–
Impact summary	Chapter 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)	Table 8-2 Table 10-1 Table 11-1
		☒ 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)	
		☒ biodiversity risk weighting for each	Table 10-1 Table 10-2
		☒ number of required species credits for each candidate threatened species that is directly impacted on by the proposal (BAM Subsection 10.1.3)	Table 12-2
		Maps and tables	
		☒ Table of PCTs requiring offset and the number of ecosystem credits required	Table 12-1
		☒ Table of threatened species requiring offset and the number of species credits required	Table 12-2
		Data	
		☐ Submitted proposal in the BAM Calculator	–
Biodiversity credit report	Chapter 10	Information	
		☒ Description of credit classes for ecosystem credits and species credits at the development	Table 11-1

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BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		or clearing site or land to be biodiversity certified (BAM Section 10.2)	Table 11-2
		☒ BAM credit report in pdf format	Appendix E
		Maps and tables	
		☒ Table of credit class and matching credit profile	Table 11-1 Table 11-2
		Data	
		☒ BAM credit report in pdf format	Appendix E

Appendix B Assessments of significance

The *Environment Protection and Biodiversity Conservation Act 1999* specifies factors to be taken into account in deciding whether a development is likely to significantly affect Threatened Ecological Communities (TEC), threatened species, and migratory species listed at the Commonwealth level. The following assesses the significance of the likely impacts associated with the proposed works on:

TEC

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

Flora

- A spear-grass (*Austrostipa wakoolica*)
- Eyebright (*Euphrasia arguta*)
- Yass Daisy (*Ammobium craspedioides*).

Fauna

- Brown Treecreeper (eastern subspecies) (*Climacteris picumnus victoriae*)
- Corben's Long-Eared Bat (*Nyctophilus corbeni*)
- Diamond Firetail (*Stagonopleura guttata*)
- Fork-tailed Swift (*Apus pacificus*)
- Golden Sun Moth (*Synemon plana*)
- Regent Honeyeater (*Anthochaera phrygia*)
- South-eastern Hooded Robin (*Melanodryas cucullata cucullata*)
- Southern Whiteface (*Aphelocephala leucopsis*)
- Striped Legless Lizard (*Delma impar*)
- Swift Parrot (*Lathamus discolor*)
- White-throated Needletail (*Hirundapus caudacutus*)
- Yellow Wagtail (*Motacilla flava*).

Different significant impact criteria apply depending on the level at which a species or community is listed (i.e., vulnerable, endangered, critically endangered etc.). The appropriate criteria have been applied to the entities listed above.

In the context of the assessments below, 'the action' refers to 'the proposal' as described in Section 1.

Significant Impact Criteria

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

- 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
- 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.
- 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

- 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, or
 - 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, or
- Interfere with the recovery of an ecological community.

An action is likely to have a significant impact on a **vulnerable species** if there is a real change or possibility that it will:

- Lead to a long-term decrease in the size of an important population of a species
- Reduce the area of occupancy of an important population
- Fragment an important population into two or more populations
- Adversely affect habitat critical to the survival of a species
- 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
- Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat
- Introduce disease that may cause the species to decline, or
- Interfere substantially with the recovery of the species.

Each of these criteria are addressed below. Please see overleaf for AoSs.

1.1 Critically Endangered and Endangered species

The *Environment Protection and Biodiversity Conservation Act 1999* specifies factors to be considered in deciding whether a development is likely to significantly affect Endangered Ecological Communities, threatened species and migratory species, listed at the Commonwealth level. These assessments characterise the significance of likely impacts associated with the proposal on the following Critically Endangered and Endangered species.

1.1.1 Critically Endangered

Birds

- Regent Honeyeater (*Anthochaera phrygia*)
- Swift Parrot (*Lathamus discolor*)

Flora

- Eyebright (*Euphrasia arguta*)

Regent Honeyeater (*Anthochaera phrygia*)

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

a) Lead to a long-term decrease in the size of a population

The *MNES Significant impact guidelines 1.1* states 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.

The presence of *Anthochaera phrygia* in the subject land has been assumed based on associated PCTs and the presence of potential habitat. There are no known records within the Subject Land however, associated PCTs; PCT 277 and PCT 76 are present as low condition grassland, moderate-high condition woodland with native dominated understorey, and moderate condition woodland with exotic understorey due to past and present land use and related agricultural activities. 1.85 ha of PCT 277 and 0.15 ha of PCT 76 occur within the development footprint, of which 0.33 ha of woodland is potential suitable habitat. No targeted surveys have been undertaken for this species; however the area of impact is adjacent to a current access track, which has previously been disturbed through track construction, edge effects and regular agricultural activities such as grazing and machinery movement.

A. phrygia has a patchy distribution between south-east Queensland and central Victoria. Known breeding areas include Bundarra-Barraba, Capertee Valley, Hunter Valley, and Chiltern (DOE, 2015). *A. phrygia* inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. It also inhabits woodlands that support a significantly high abundance and species richness of bird species, high numbers of mature trees, high canopy cover and abundance of mistletoes (DOE, 2015). The subject land lacked these features, therefore the likelihood of the species using the woodland as foraging habitat is low.

A. phrygia feeds mainly on the nectar from a relatively small number of eucalypts that produce high volumes of nectar. Key eucalypt species include Mugga Ironbark, Yellow Box, White Box and Swamp Mahogany. Other tree species may be regionally important. Flowering of associated species such as Thin-leaved Stringybark (*Eucalyptus eugenioides*) and other Stringybark species, and Broad-leaved Ironbark (*E. fibrosa*). Nectar and fruit from the mistletoes (*Amyema miquelii*, *A. pendula* and *A. cambagei*) are also utilised (DOE, 2015).

As part of the proposal, the action would impact potential habitat including 0.33 ha of woodland as potential foraging habitat. Within the subject land, 1.82 ha of woodland would be retained, and approximately 30 ha retained within the locality. In addition, at least 100 ha of woodland within the locality would be retained. No targeted surveys have been undertaken for this species; however the area of impact is adjacent to a current access track, which has previously been disturbed through track construction, edge effects and regular agricultural activities such as grazing and machinery movement.

This species requires careful consideration as part of any works as it is critically endangered. There are no records of this species within the subject land or within 10 km of the subject land (BioNet, 2025). In consideration of the above factors, **it is unlikely the proposed works would lead to a long-term decrease in the size of an *A. phrygia* population.**

b) Reduce the area of occupancy of the species

In the subject land, 1.82 ha of woodland would be retained as part of the project, with an additional 30 ha in the locality. Woodland includes moderate-high condition areas with native dominated understorey, and moderate condition areas with exotic understorey due to past and present land use and related agricultural activities. In the study area (subject land), 1.29 ha of PCT 76 and 5.08 ha of PCT 277 are retained by the project.

The proposed action would reduce potential habitat by 0.33 ha. With the abundance of retained woodland in the locality, it is unlikely the reduction of 0.33 ha of potential habitat would significantly reduce the area of occupancy for the species. This also considers current land use which includes pastoral development and stock, resulting in grazing pressure, trampling and browsing. No individuals or population of this species have been observed in the subject land. **Considering these factors, the proposed project is not likely to significantly reduce the area of occupancy of the species.**

c) Fragment an existing population into two or more populations

Due to the lack of records of *A. phrygia* in the locality, it is unlikely that increasing the existing access track from eight metres to 23 m at the widest points would significantly impact any *A. phrygia* populations. This species is highly mobile and has a wide distribution area, and would not be likely to be impacted through the installation of a BESS. **Therefore, the project is unlikely to cause fragmentation of an existing population into two or more populations.**

d) Adversely affect habitat critical to the survival of a species

The MNES Significant impact guidelines 1.1 states '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.

According to the criteria in the *MNES Significant guidelines 1.1*, the proposed action would remove 0.33 ha of potential foraging habitat, however this is not classified as habitat critical to the survival of the species. However, approximately 30 ha of suitable foraging habitat would remain in the locality, if the species were to occupy the area. In addition, 20 Hollow-Bearing Trees (HBTs) would be retained within the subject land, while five would be removed as part of the proposed action.

Considering the above factors, **the proposed action is unlikely to adversely affect habitat critical to the survival of the species**. In addition, the extent is minor in the context of the locality. Due to the abundance of woodland retained within the locality, it is unlikely that this action would result in the decline of the species.

e) Disrupt the breeding cycle of an population

Breeding times for *A. phrygia* varies between regions, aligning with eucalypt flowering and mistletoe flowering. Breeding mostly occurs during spring and summer, from August to January. *A. phrygia* nests usually occur in the canopy of mature trees with rough bark (DOE, 2015). **The proposed project is not likely to disrupt the breeding cycle of a population of *A. phrygia*** as there are no existing records of the species within the subject land or within a 10 km radius of the subject land (BioNet, 2025).

f) Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

The proposed action would remove 0.33 ha of habitat critical to the survival of the species in the form of foraging habitat. However, approximately 30 ha of suitable foraging habitat would remain in the locality, if the species were to occupy the area. The lack of diverse structure also indicate that the woodland area in the subject land is not preferred, therefore less likely for the species to occupy the area.

Considering the above factors and the abundance of woodland retained within the locality, it is unlikely that this action would result in the decline of the species. Given this, removal of 0.33 ha of potential habitat as a result of the **action is not likely to modify, destroy, remove or decrease the availability of habitat from the proposed development footprint to the extent that the species is likely to decline**.

g) Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the critically endangered or endangered species' habitat

The MNES Significant impact guidelines 1.1 states 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.

The proposal has the potential to contribute to the spread of invasive species, mainly through the clearing of vegetation and transfer and introduction of plant material and soil on machinery. Standard biosecurity hygiene is recommended to prevent the spread of weeds on site. Recommendations include:

- Vehicles and machinery to be checked for soil and plant matter and washed-down prior to entering the site
- Brushing and cleaning boots if walking through potential habitat in subject land

With these mitigation measures implemented, the **proposed action would therefore be unlikely to result in the introduction or spread of invasive species that are harmful to these species becoming established in their potential habitat.**

h) Introduce disease that may cause the species to decline, or

There are no listed diseases that threaten *A. phrygia*. The proposed action is considered unlikely to result in the likelihood of disease introduction within the subject land, such that the species is likely to decline. Mitigation measures including standard biosecurity hygiene practices, have been recommended to prevent the introduction and spread of diseases on site. With these mitigation measures in place, **the proposal would be unlikely to result in introducing diseases that are harmful to these species becoming established in their potential habitat.**

i) Interfere with the recovery of the species.

The proposed action would remove 0.33 ha of potential habitat for this species, and retain 1.82 ha in the subject land, with 30 ha of potential habitat remaining in the locality. The majority of this woodland is adjacent to existing and frequently utilised access tracks within an agricultural landscape.

There are four listed strategies to achieve the objectives in the species' Recovery Plan, including:

- Improve the extent and quality of species habitat
- Bolster the wild population with captive-bred birds until the wild population becomes self-sustaining
- Increase understanding of the size, structure, trajectory and viability of the wild population.
- Maintain and increase community awareness, understanding and involvement in the recovery program.

(DOE, 2016)

The action would reduce potential foraging habitat by 0.33 ha. **Therefore, the proposed action would interfere with the recovery of the *A. Phrygia*** through habitat removal. However, the extent is minor in the context of the locality

j) Conclusion.

The proposed action is not likely to lead to a long-term decrease in the size of an *A. phrygia* population, significantly reduce its area of occupancy, or fragment an existing population into two or more populations. It is not likely to adversely affect habitat critical to the survival of the species, but would interfere with the recovery of the species. The proposed action is not likely to disrupt the breeding cycle of a population. Due to the abundance of woodland being retained within the locality (30 ha) and lack of preferred feeding habitat (mistletoes) in the subject land, the proposed action is not likely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline. With standard biosecurity protocols in place, the proposed action is not likely to introduce disease that may cause the species to decline, or result in invasive species becoming established in the species' habitat. Recommended mitigation measures include:

- Vehicles and machinery to be checked for soil and plant matter and washed-down prior to entering the site
- Brushing and cleaning boots if walking through native vegetation.

Considering the above factors, the **proposed action is not likely to have a significant impact on the *A. phrygia*.**

Swift Parrot (<i>Lathamus discolor</i>)
An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:
a) Lead to a long-term decrease in the size of a population
The MNES Significant impact guidelines 1.1 states 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. <i>L. discolor</i> breeds in Tasmania during spring and summer, migrating in the autumn and winter months to south-eastern Australia from Victoria and the eastern parts of South Australia to south-east Queensland. In NSW mostly occurs on the coast and south-west slopes. On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations (Threatened Species Scientific Committee, 2016). Favoured feed trees include winter flowering species such as Swamp Mahogany (<i>Eucalyptus robusta</i>), Spotted Gum (<i>Corymbia maculata</i>), Red Bloodwood (<i>C. gummifera</i>), Forest Red Gum (<i>E. tereticornis</i>), Mugga Ironbark (<i>E. sideroxylon</i>), and White Box (<i>E. albens</i>). Commonly used lerp infested trees include Inland Grey Box (<i>E. microcarpa</i>), Grey Box (<i>E. moluccana</i>), Blackbutt (<i>E. pilularis</i>), and Yellow Box (<i>E. melliodora</i>) (Threatened Species Scientific Committee, 2016). The presence of <i>Lathamus discolor</i> in the subject land has been assumed based on associated PCTs and the presence of potential habitat. There are no known records within the Subject Land however, associated PCTs; PCT 277 and PCT 76 are present as low condition grassland, moderate-high condition woodland with native dominated understorey, and moderate condition woodland with exotic understorey due to past and present land use and related agricultural activities. Of this, 0.33 ha of woodland as potential habitat would be removed as part of the proposed action. Within the locality, 30 ha of potential habitat would remain in the locality and at least 100 ha within a 10 km radius of the subject land. No targeted surveys have been undertaken for this species; however the area of impact is adjacent to a current access track, which has previously been disturbed through track construction, edge effects and regular agricultural activities such as grazing and machinery movement. This species requires careful consideration as part of any works as it is critically endangered. There are no records of this species within the subject land, however there are two records of <i>L. discolor</i> within 10 km of the subject land (BioNet, 2025). The most recent record was observed in 2015 in Livingstone National Park, approximately 7.8 km northeast of the subject land. The vegetation in Livingstone National Park is more intact than the Subject land and contains favoured feed trees of Mugga Ironbark. In consideration of the above factors, the proposed works are not likely to lead to a long-term decrease in the size of an <i>L. discolor</i> population.
b) Reduce the area of occupancy of the species
In the subject land, 1.82 ha of woodland would be retained as part of the project, with an additional 30 ha in the locality. Woodland includes moderate-high condition areas with native dominated understorey, and moderate condition areas with exotic understorey due to past and present land use and related agricultural

activities. In the study area (subject land), 1.29 ha of PCT 76 and 5.08 ha of PCT 277 are retained by the project.

The proposed action would reduce potential habitat by 0.33 ha. With the abundance of retained woodland in the locality, it is unlikely the reduction of 0.33 ha of potential habitat would significantly reduce the area of occupancy for the species. This also considers current land use which includes pastoral development and stock, resulting in grazing pressure, trampling and browsing. No individuals or population of this species have been observed in the subject land. **Considering these factors, the proposed project is not likely to significantly reduce the area of occupancy of the species.**

c) Fragment an existing population into two or more populations

It is unlikely that increasing the existing access track from eight metres to 23 m at the widest points would significantly impact any *L. discolor* populations. This species is also highly mobile and has a wide distribution across south-eastern Australia, migrating between Tasmania and mainland Australia (Threatened Species Scientific Committee, 2016). Therefore, it would be unlikely that the installation of a BESS and removal of 0.33 ha of woodland from the locality would **cause fragmentation of an existing population into two or more populations**. This is also considering that approximately 30 ha of woodland would be retained within the locality.

d) Adversely affect habitat critical to the survival of a species

The MNES Significant impact guidelines 1.1 states '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.

According to the criteria in the *MNES Significant guidelines 1.1*, the proposed action would remove 0.33 ha of habitat critical to the survival of the species in the form of foraging habitat. This is due to the presence of favoured feed trees within the subject land, including: White Box, Yellow Box and Grey Box trees. In addition, 20 Hollow-Bearing Trees (HBTs) would be retained within the subject land, while five would be removed as part of the proposed action. However, approximately 30 ha of suitable foraging habitat would remain in the locality, if the species were to occupy the area.

Considering the above factors, **the proposed action is likely to adversely affect habitat critical to the survival of the species, however the extent is minor in the context of the locality.** Due to the abundance of woodland retained within the locality, it is unlikely that this action would result in the decline of the species.

e) Disrupt the breeding cycle of an population

L. discolor breeds in Tasmania, then move to mainland Australia in autumn. Therefore, the **proposed project is not likely to disrupt the breeding cycle of a population of *L. discolor*.**

f) Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

The proposed action would remove 0.33 ha of habitat critical to the survival of the species in the form of foraging habitat. However, approximately 30 ha of suitable foraging habitat would remain in the locality, if the species were to occupy the area.

Considering the above factors and the abundance of woodland retained within the locality, it is unlikely that this action would result in the decline of the species. Given this, removal of 0.33 ha of potential habitat as a result of the **action is not likely to modify, destroy, remove or decrease the availability of habitat from the proposed development footprint to the extent that the species is likely to decline.**

g) Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the critically endangered or endangered species' habitat

The MNES Significant impact guidelines 1.1 states 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.

The proposal has the potential to contribute to the spread of invasive species, mainly through the clearing of vegetation and transfer and introduction of plant material and soil on machinery. *L. discolor* is also at risk of predation by feral cats. The proposed action is unlikely to increase the prevalence of feral cats within the agricultural landscape. Standard biosecurity hygiene is recommended to prevent the spread of weeds on site. Recommendations include:

- Vehicles and machinery to be checked for soil and plant matter and washed-down prior to entering the site
- Brushing and cleaning boots if walking through potential habitat in subject land

With these mitigation measures implemented, the **proposed action would therefore be unlikely to result in the introduction or spread of invasive species that are harmful to these species becoming established in their potential habitat.**

h) Introduce disease that may cause the species to decline, or

L. discolor is at risk of Psittacine Beak and Feather Disease (PBFD), a potentially fatal disease caused by psittacine circovirus. It is a widespread disease that is known to occur in *L. discolor* (Threatened Species Scientific Committee, 2016).

The proposed action is considered unlikely to result in PBFD introduction within the subject land, such that the species is likely to decline. Mitigation measures including standard biosecurity hygiene practices, have been recommended to prevent the introduction and spread of diseases on site. With these mitigation measures in place, **the proposal would be unlikely to result in introducing diseases that are harmful to these species becoming established in their potential habitat.**

i) Interfere with the recovery of the species.

The proposed action would remove 0.33 ha of potential habitat for this species, and retain 1.82 ha in the subject land, with 30 ha of potential habitat remaining in the locality. The majority of this woodland is adjacent to existing and frequently utilised access tracks within an agricultural landscape.

The Recovery Plan for *L. discolor* lists the following objectives to achieve by 2032 for the species, including:

- Maintain or improve the extent, condition and connectivity of habitat
- Anthropogenic threats to the species are demonstrably reduced

- Measure and sustain a positive population trend.

(DCCEEW, 2024)

One of the strategies listed is to maintain known breeding and foraging habitat at the local, regional and landscape scales. The action would reduce potential foraging habitat by 0.33 ha, interfering with the species' recovery through habitat removal, **Therefore, the proposed action is likely to interfere with the recovery of *L. discolor*.** However, the extent is minor in the context of the locality.

j) Conclusion.

The proposed action is not likely to lead to a long-term decrease in the size of an *L. discolor* population, significantly reduce its area of occupancy, or fragment an existing population into two or more populations. It is likely to adversely affect habitat critical to the survival of the species and interfere with the recovery of the species through removal of foraging habitat. The proposed action is not likely to disrupt the breeding cycle of a population. Due to the abundance of woodland being retained within the locality (30 ha), the proposed action is not likely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline. With standard biosecurity protocols in place, the proposed action is not likely to introduce disease that may cause the species to decline, or result in invasive species becoming established in the species' habitat. Recommended mitigation measures include:

- Vehicles and machinery to be checked for soil and plant matter and washed-down prior to entering the site
- Brushing and cleaning boots if walking through native vegetation.

Considering the above factors, overall the **proposed action is not likely to have a significant impact on the *L. discolor*.**

Eyebright (*Euphrasia arguta*)

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

a) Lead to a long-term decrease in the size of a population

The MNES Significant impact guidelines 1.1 states 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.

The presence of *Euphrasia arguta* in the subject land has been assumed based on associated PCTs and the presence of potential habitat. There are no known records within the Subject Land however, associated PCTs; PCT 277 and PCT 76 are present as low condition grassland, moderate-high condition woodland with native dominated understorey, and moderate condition woodland with exotic understorey due to past and present land use and related agricultural activities. Distribution for this species is considered to be from six sites that are up to 25 km apart, in the area of Nundle State Forest, within the Nandewar Bioregion. The closest site to the Subject Land is in Rylstone, approximately 500 km Northeast of the Subject Land. Prior to its rediscovery in the Nundle State Forest in 2008, the only available information about the species came from the type specimen. Previous habitat consisted of grassy areas near rivers at elevations of up to 700 m above sea level with an annual rainfall of 600 mm. Recently discovered populations have been found in grassy forests or regrowth vegetation (DSEWPC, 2011).

E. arguta is primarily threatened by road maintenance and clearing of roadside vegetation for firebreaks. The dominant potential threats include browsing by domestic stock, rabbits and macropods, in addition to land clearing. As the grasslands and woodlands within the development footprint have a current presence of domestic stock and are regularly grazed, it is unlikely that the development footprint would be ideal habitat for Eyebright.

As part of the proposal, the action would impact potential habitat including 1.85 ha of PCT 277 and 0.15 ha of PCT 76. The majority of this area (83.7 %) is low condition grassland, with 6.37 ha of potential habitat in the subject land not being impacted by the proposed project. No targeted surveys have been undertaken for this species; however the area of impact is adjacent to a current access track, which has previously been disturbed through track construction, edge effects and regular agricultural activities such as grazing and machinery movement. This combination of land use activity and threats result in low likelihood of this habitat supporting an *E. arguta* population.

This species requires careful consideration as part of any works as it is critically endangered. There are no records of this species within the subject land or within 10 km of the subject land (BioNet, 2025). In consideration of the above factors, and the absence of any known *E. arguta* populations within the entirety of the subject land, the **proposed works are not likely to lead to a long-term decrease in the size of an *E. arguta* population.**

b) Reduce the area of occupancy of the species

As part of the proposal, the area of impact of potential habitat for this species is 2.00 ha, including 1.85 ha of PCT 277 and 0.15 ha of PCT 76. The majority of this area (83.7 %) is low condition grassland (1.67 ha), adjacent to an existing and frequently utilised access track, that has undergone past disturbances from track construction, grazing and machinery movement. In the study area (subject land), 1.29 ha of PCT 76 and 5.08 ha of PCT 277 are retained by the project. Therefore, 23.89% of the native vegetation in the subject land is being impacted by the project. State Vegetation Type Mapping (NSW DCCEEW, 2020)

shows that there is 173.52 ha of native vegetation in the assessment area (1500 m locality), therefore 1.15% of native vegetation within the assessment area is proposed to be removed.

Due to the degraded condition of grassland in the development footprint and subject land, it is unlikely that suitable habitat would appropriately support the occupancy of this species. This also considers current land use which includes pastoral development and stock, resulting in grazing pressure, trampling and browsing. No individuals or population of this species have been observed in the subject land.

Considering these factors, the proposed project is not likely to significantly reduce the area of occupancy of the species.

c) Fragment an existing population into two or more populations

There are no known or existing populations of this species within the subject land. Due to the degraded condition of vegetation along the existing track edge and current grazing pressure, it is unlikely that suitable habitat would appropriately support a population of this species. **Therefore, the project is unlikely to cause fragmentation of any populations of this species.**

d) Adversely affect habitat critical to the survival of a species

The MNES Significant impact guidelines 1.1 states '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.

The Subject Land is considered within the predicted distribution for *Euphrasia arguta* under the NSW threatened species profile (OEH, 2020), however, the development footprint and wider subject land is not located in any of the known or predicted distribution areas under the federal threatened species profile (DCCEEW, 2025). Current and historic land use includes clearing, vehicle traffic, chemical drift, trampling, pastoral development and stock, resulting in grazing pressure and presence of exotic grasses and weeds. Considering these factors, the development footprint and surrounding subject land is not considered likely to be critical habitat for this species.

While the action proposes to remove 2.00 ha of potential habitat from the development footprint, 6.37 ha of potential habitat would be retained within the subject land. No habitat critical to the survival of this species is listed in its Approved Conservation Advice (DCCEEW, 2014), or on the Register of Critical Habitat. There is no existing recovery plan for this species (DCCEEW, 2025).

Considering the above factors, potential habitat within the development footprint is not considered critical habitat for Eyebright. Therefore, **the proposed action is unlikely to adversely affect habitat critical to the survival of the species.**

e) Disrupt the breeding cycle of an population

Euphrasia arguta is an annual herb. It has been observed to die off over winter, with active growth occurring between January and April (NSW OEH, 2020). **The proposed project is not likely to disrupt the breeding cycle of a population of *E. arguta*** as there are no existing or known populations of the species within the subject land or within a 10 km radius of the subject land (BioNet, 2025).

f) Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

The proposed project includes removal of 2.00 ha potential habitat for this species, including 1.85 ha of PCT 277 and 0.15 ha of PCT 76. A lack of known records within 10 km of the Subject Land, the species' distribution and current land use indicate that the development footprint is not likely to support this species. This considers the presence of multiple threats that already exist within the subject land, including trampling, browsing, grazing and habitat loss, disturbance and modification. Given this, removal of 2.00 ha of potential habitat as a result of the **action is not likely to modify, destroy, remove or decrease the availability of habitat from the proposed development footprint to the extent that the species is likely to decline.**

g) Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the critically endangered or endangered species' habitat

The MNES Significant impact guidelines 1.1 states 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.

The proposal has the potential to contribute to the spread of invasive species, mainly through the clearing of vegetation and transfer and introduction of plant material and soil on machinery. Standard biosecurity hygiene is recommended to prevent the spread of weeds on site. Recommendations include:

- Vehicles and machinery to be checked for soil and plant matter and washed-down prior to entering the site
- Brushing and cleaning boots if walking through potential habitat in subject land

With these mitigation measures implemented, the **proposed action would therefore be unlikely to result in the introduction or spread of invasive species that are harmful to these species becoming established in their potential habitat.**

h) Introduce disease that may cause the species to decline, or

There are no listed diseases that threaten *E. arguta*. A general potential threat to flora is *Phytophthora cinnamomi* dieback (DCCEEW, 2021). The proposed action is considered unlikely to result in the likelihood of *P. cinnamomi* introduction within the subject land, such that the species is likely to decline. Mitigation measures including standard biosecurity hygiene practices, have been recommended to prevent the introduction and spread of diseases on site. With these mitigation measures in place, **the proposal would be unlikely to result in introducing diseases that are harmful to these species becoming established in their potential habitat.**

i) Interfere with the recovery of the species.

The proposed action would remove 2.00 ha of potential habitat for this species, including 1.85 ha of PCT 277 and 0.15 ha of PCT 76. The majority of this area (83.7 %) is low condition grassland (1.67 ha), adjacent to existing and frequently utilised access tracks. In the study area (subject land), 1.29 ha of PCT 76 and 5.08 ha of PCT 277 are retained by the project. Although there is currently no National Recovery Plan for Eyebright (DCCEEW, 2025), Approved Conservation Advice lists the following Priority Actions:

- Undertake appropriate seed collection and storage
- Investigate options for linking, enhancing or establishing additional populations

- Implement national translocation protocols if establishing additional populations is considered necessary and feasible (DSEWPC, 2011).

The proposed action would not impact the Priority Actions listed in Eyebright Conservation Advice. The development footprint and wider subject land is not located within any priority management sites or species occurrence areas (NSW DPE, 2025). **Therefore, the proposed action is not likely to interfere with the recovery of the *E. arguta*.**

j) Conclusion.

The proposed action is not likely to lead to a long-term decrease in the size of a *Euphrasia arguta* population, reduce its area of occupancy or fragment an existing population into two or more populations. It is not likely to adversely affect habitat critical to the survival of the species, disrupt the breeding cycle of a population or interfere with the recovery of the species. Due to the degraded condition of the landscape and that multiple key threats already impact the development footprint, the proposed action is not likely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline. With standard biosecurity protocols in place, the proposed action is not likely to introduce disease that may cause the species to decline, or result in invasive species becoming established in the species' habitat. Recommended mitigation measures include:

- Vehicles and machinery to be checked for soil and plant matter and washed-down prior to entering the site
- Brushing and cleaning boots if walking through native vegetation.

Considering the above factors, the **proposed action is not likely to have a significant impact on the *Euphrasia arguta*.**

1.1.2 Endangered

Birds

- South-eastern Hooded Robin, Hooded Robin (*Melanodryas cucullata cucullata*)

Flora

- A spear-grass (*Austrostipa wakoolica*)

South-eastern Hooded Robin, Hooded Robin (*Melanodryas cucullata cucullata*)

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

a) Lead to a long-term decrease in the size of a population

The MNES Significant impact guidelines 1.1 states 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.

M. cucullata cucullata occurs in south-eastern Australia from far south-east Queensland to the Yorke Peninsula in South Australia. The species prefers dry eucalypt and acacia woodlands and shrublands with an open understorey, some grassy areas and a complex ground layer. Woodlands with tall trees or dense tree cover are generally avoided by the species, however they may occur in tall, dense heaths with scattered open areas. They are considered a sedentary species, but local seasonal movements are possible. In agricultural landscapes they prefer patches of habitat greater than 10 ha with moderately deep to deep soils, however they can occur in patches as small as 2.9 ha (DCCEEW, 2023). They forage on insects and small lizards, hunting for invertebrates in grassy clearings. *M. cucullata cucullata* perches on low dead stumps and fallen timber or on low-hanging branches (DCCEEW, 2023).

The presence of *Melanodryas cucullata cucullata* in the subject land has been assumed based on associated PCT 277 and PCT 76, and the presence of potential habitat. Of the total 2.00 ha of potential habitat proposed to be removed, 0.33 ha is woodland, and 1.67 ha is grassland. 1.85 ha of PCT 277 is present as low condition grassland, moderate-high condition woodland with native dominated understorey, and moderate condition woodland with exotic understorey due to past and present land use and related agricultural activities. PCT 76 is present as 0.15 ha or low condition grassland. No targeted surveys have been undertaken for this species; however the area of impact is adjacent to a current access track, which has previously been disturbed through track construction, edge effects and regular agricultural activities such as grazing and machinery movement.

Territories range from around 10 ha during the breeding season (July – November), to 30 ha in the non-breeding. They typically nest in a small, neat cup of bark and grasses bound with webs, in a tree fork or crevice, from less than 1-5 m above the ground. They also usually return to the same breeding site (DCCEEW, 2023).

As part of the proposal, the action would impact potential habitat including 2.00 ha as potential foraging and breeding habitat. Within the subject land, 6.37 ha of potential habitat would be retained, and 171.52 ha of potential habitat retained within the locality. No targeted surveys have been undertaken for this species;

however the area of impact is adjacent to a current access track, which has previously been disturbed through track construction, edge effects and regular agricultural activities such as grazing and machinery movement.

In consideration of the above factors, **the proposed action is not likely to result in a long-term decrease in the size of a *M. cucullata cucullata* population.**

b) Reduce the area of occupancy of the species

According to the Conservation Advice for *M. cucullata cucullata*, the area of occupancy for the subspecies is approximately 30,000 km². This is based on the number of 2 x 2 km squares within which they have been recorded since 1990 (DCCEEW, 2023). The proposed work would impact 2 ha (0.02 km²) of potential habitat for this species across its area of occupancy. Therefore, impacting <0.01 % of its occupancy area. Within the subject land, 6.37 ha of potential habitat would be retained, and 171.52 ha of potential habitat retained within the locality. **it is unlikely that the proposed work will significantly reduce the area of occupancy for the species.**

c) Fragment an existing population into two or more populations

M. cucullata cucullata is a largely sedentary species, mostly seen in pairs or small groups. Due to widespread distribution of the subspecies, as well as the fragmentation of woodland habitat and low dispersal distances of the species, it is likely that many subpopulations of the species already occur throughout its distribution range (DCCEEW, 2023). There are five records of *M. cucullata cucullata* within 10 km of the subject land, all observed in Livingstone National Park. The most recent record was observed in 2007, approximately 7.4 km in proximity to subject land. Livingstone National Park has more intact and structurally diverse vegetation in comparison to the subject land.

The proposed impacts would create an increase of track widths from eight metres up to 23 m in width causing additional minor fragmentation. However, as the species has not been observed in the subject land or assessment area, **it is unlikely that the proposed project will fragment an existing population into two or more populations.** The retained vegetation provides a sufficient habitat corridor for the species to move throughout the landscape, in addition to providing foraging habitat.

d) Adversely affect habitat critical to the survival of a species

The MNES Significant impact guidelines 1.1 states '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.

No habitat critical to the survival of this species is listed on the Register of Critical Habitat (DCCEEW, 2025). There is no existing recovery plan for this species (DCCEEW, 2025).

However, Conservation Advice for *M. cucullata cucullata* (DCCEEW, 2023) lists the following as habitat critical to the survival of the species:

- 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.

Multiple areas of the subject land and surrounding vegetation constitute eucalypt woodland with an open understorey, standing dead of live trees and structurally diverse habitats. Therefore, the 2.00 ha of habitat to be removed is categorised as habitat critical to the survival of the species. This consists of low condition grassland, moderate-high condition woodland with native dominated understorey, and moderate condition woodland with exotic understorey due to past and present land use and related agricultural activities.

In consideration of the above factors, **the proposed action would adversely affect habitat critical to the survival of *M. cucullata cucullata*, however the extent is minor in the context of the locality.**

e) Disrupt the breeding cycle of an population

The breeding season for *M. cucullata cucullata* occurs between July and November. Birds usually return to the same breeding sites each year, where they typically rear several broods each season. Nests are generally situated in a tree fork or crevice from less than 1-5 m above the ground, and are generally cups of bark and grasses bound with webs (DCCEEW, 2023).

Targeted surveys have not been undertaken for this species. Given the proposal would remove only five trees suitable for nesting out of a 30 ha patch of woodland **it is unlikely that the proposed project would disrupt the breeding cycle of a *M. cucullata cucullata* population.**

f) 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 is a threat to *M. cucullata cucullata* (DCCEEW, 2023). While the proposed work would remove 0.33 ha of woodland (including five Hollow-Bearing Trees (HBTs)) and 1.67 ha of grassland, 6.37 ha of potential habitat would be retained in the subject land. Within the locality, approximately 30 ha of adjacent suitable habitat (woodland) is being retained, in addition to 20 HBTs within the subject land.

Therefore, it is unlikely the that proposed work would modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.

g) Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the critically endangered or endangered species' habitat

The MNES Significant impact guidelines 1.1 states that 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.

Conservation Advice lists rabbits and feral deer as invasive species which threaten the *M. cucullata cucullata* (DCCEEW, 2023). This is through grazing and browsing pressure which has reduced the capacity of woodlands to regenerate, consequently reducing nesting, feeding and foraging sites. Additionally, feral deer also cause soil erosion due to their hard hooves. Feral deer are currently present within the subject land, having been observed during field surveys.

Introduced predatory fauna species such as cats (*Felis catus*) and foxes (*Vulpes vulpes*) are also a threat to *M. cucullata cucullata* as they are a ground foraging species. Additionally, invasive weeds are also considered a threat as they have the ability to change the floristic and structural characteristics of the habitat, which can change the availability of suitable habitat for the species (DCCEEW, 2023).

The proposed action has the potential to contribute to the spread of invasive weed species in the subject land through the transfer and introduction of plant material and soil on machinery. Any removal of native plant species also presents opportunities for invasive species to establish where ground cover is exposed. The implementation of appropriate biosecurity practices will assist to prevent and control these impacts. With the implementation of these mitigation measures, the proposal is not considered likely to exacerbate this impact to the point that it would constitute a substantial reduction in the quality or integrity of the species habitat within the subject land.

The proposed project is considered unlikely to generate an increase in invasive fauna species harmful to the species, such as feral cats, deer or foxes, above what is currently present. **The project is not considered likely to exacerbate this impact to the point that it would constitute a substantial reduction in the quality or integrity of the species habitat within the subject land.**

h) Introduce disease that may cause the species to decline, or

Conservation Advice for *M. cucullata cucullata* does not identify any diseases that may affect this species (DCCEEW, 2023). There is a risk that diseases could be introduced to the subject land via machinery, vehicles, and materials during clearing, construction and operation. With the implementation of the recommended mitigation measures, **the proposal is unlikely to result in the introduction of any disease that may cause the species to decline.**

i) Interfere with the recovery of the species.

There is currently no recovery plan for this species. However, there is a conservation and recovery action outlined within the Conservation Advice (DCCEEW, 2023). This is:

- Stabilise or increase populations across the range.

There are several conservation and management priorities to achieve this. One of the priorities is ceasing all land clearing of habitat critical to the survival of *M. cucullata cucullata* (DCCEEW, 2023).

However, another priority is to undertake revegetation, focussing on expanding and connecting areas of existing habitat (DCCEEW, 2023). Since the actions associated with the proposed project cannot be avoided, **the proposed action would therefore interfere with the recovery of *M. cucullata cucullata* through impacts to potential habitat.** However, the impacts are minor in the context of the locality and unlikely to significantly impact the recovery of the species.

j) Conclusion.

Although the proposed action includes removal of habitat critical to the survival of *M. cucullata cucullata* through clearing of 2.00 ha of potential foraging and breeding habitat, and interfere with the recovery of the species as a result, impacts are minor in the context of the locality. It is not likely to reduce the area of occupancy of the species, lead to a long-term decrease in the size of a population, or fragment any existing populations into two or more populations. The 1.67 ha of low condition grassland in combination with 0.33 ha of woodland proposed to be cleared is unlikely to remove or decrease the availability of habitat to the extent that the species is likely to decline. With standard biosecurity measures in place, it is unlikely that the project would introduce disease or result in the introduction or spread of invasive species suitable habitat. The approximate 6.37 ha of adjacent suitable habitat being retained within the subject land, including 20 HBTs, would be sufficient for foraging and breeding for *M. cucullata cucullata* if it were

to occupy the area. In addition, approximately 30 ha of woodland would be retained within the locality, as well as a total native vegetation area of 171.52 ha as potential habitat.

Mitigation measures are recommended to minimise impacts to this species and include:

- Vehicles and machinery to be checked for soil and plant matter and washed-down prior to entering the site
- Brushing and cleaning boots if walking through native vegetation
- Clear delineation of vegetation to be cleared or retained
- Marking of Tree Protection Zones (TPZs) during clearing phase of project

Considering the above factors, and with appropriate mitigation measures in place, **it is unlikely that the proposed action will have a significant impact on *M. cucullata cucullata*.**

A spear-grass (*Austrostipa wakoolica*)

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

a) Lead to a long-term decrease in the size of a population

The MNES Significant impact guidelines 1.1 states 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.

The presence of *Austrostipa wakoolica* in the subject land has been assumed based on the presence of associated PCTs in the BAM-C. There are no known records within the subject land. Targeted surveys have not yet been undertaken.

This species has a very limited distribution, confined to floodplains of Murray River tributaries, of central-western and south-western NSW. *Austrostipa wakoolica* grows in open woodland, on grey silty clay or sandy loam soils (DCCEEW, 2014).

Although there is partial suitable habitat in the development footprint, there are no known existing populations or records of this species observed within the subject land or within 10 km of the subject land (BioNet, 2025). Although no targeted surveys have been undertaken, the area of impact is adjacent to a current access track, which has previously been disturbed through track construction, edge effects and regular agricultural activities such as grazing and machinery movement. Therefore is unlikely to host a population of the species. **The proposed project is unlikely to lead to a long-term decrease in the size of an *Austrostipa wakoolica* population.** Targeted surveys would be undertaken in Spring to ensure no inadvertent impacts would occur to this species.

b) Reduce the area of occupancy of the species

As part of the proposal, the area of impact of potential habitat for this species is 2.00 ha, including 1.85 ha of PCT 277 and 0.15 ha of PCT 76. The majority of this area (83.7 %) is low condition grassland (1.67 ha), adjacent to existing and frequently utilised access tracks. State Vegetation Type Mapping (NSW DCCEEW, 2020) shows that there is 173.52 ha of native vegetation within a 1500 m radius of the subject land (assessment area), therefore only 1.15% of native vegetation within the assessment area is proposed to be removed.

In the adjacent areas of the development footprint (subject land), 1.29 ha of PCT 76 and 5.08 ha of PCT 277 are not being impacted by the project. Therefore, 23.89% of the native vegetation in the subject land is being impacted by the project. However, in the wider locality connected to the development footprint, approximately 30 ha of woodland would also be retained. Therefore, only reducing the area of woodland in the locality by less than 2 %.

Due to the degraded condition of grassland in the development footprint and subject land, it is unlikely that suitable habitat would appropriately support the occupancy of this species. This also considers current land use which includes pastoral development and stock, resulting in grazing pressure and presence of exotic grasses and weeds. This species does not tolerate disturbance, requiring sites that are protected from the impacts of herbivore grazing (DCCEEW, 2014). No individuals or population of this species have been observed in the subject land. **Considering these factors, the proposed project is not likely to significantly reduce the area of occupancy of the species.**

c) Fragment an existing population into two or more populations

There are no known or existing populations of this species within the subject land. Due to the degraded condition of vegetation along the existing track edge and current grazing pressure, it is unlikely that suitable habitat would appropriately support a population of this species. **Therefore, the project is unlikely to cause fragmentation of any populations of this species.**

d) Adversely affect habitat critical to the survival of a species

The MNES Significant impact guidelines 1.1 states '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.

No habitat critical to the survival of this species is listed in its Approved Conservation Advice, or on the Register of Critical Habitat (DCCEEW, 2014). There is no existing recovery plan for this species (DCCEEW, 2025).

Due to the degraded condition of vegetation along the existing track edge, current grazing pressure and general agricultural activities, it is unlikely that the Subject Land would appropriately support the occupancy of this species. This development footprint is not considered critical habitat for this species. **Therefore, the project would not adversely affect habitat critical to the survival of this species.**

e) Disrupt the breeding cycle of an population

There are no known or existing populations of this species within the subject land. *Austrostipa wakoolica* flowers in response to rain, and has been recorded flowering from October to December (DCCEEW, 2014). Dispersal of seed is predominantly via wind, rain and flood events, where the awn and sharp point of the floret enables the seed to be buried into the soil (DCCEEW, 2014). Due to the degraded condition of vegetation along the existing track edge and current grazing pressure, it is unlikely that suitable habitat would appropriately support a population of this species. **The project is unlikely to disrupt the breeding cycle of a population of A. wakoolica .**

f) Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

The proposed project includes removal of 2.00 ha potential habitat for this species, including 1.85 ha of PCT 277 and 0.15 ha of PCT 76. This species prefers to inhabit open woodland, on grey silty clay or sandy loam soils (DCCEEW, 2014). The project proposes to remove 0.33 ha of woodland (PCT 277) from the development footprint, of which 0.11 ha is in moderate condition with exotic understorey due to past and present land use and agricultural activities. 0.22 ha is moderate-high condition woodland with native dominated understorey. Although the proposed project area contains open woodland, soils were predominantly red-brown clay, with brown silty clay in some areas.

Due to the degraded condition of grassland in the development footprint and subject land, in combination with partial presence of potential habitat, it is unlikely that this species would colonise the project area. This also considers current land use which includes pastoral development and stock, resulting in grazing

pressure and presence of exotic grasses and weeds. This species does not tolerate disturbance, requiring sites that are protected from the impacts of herbivore grazing (DCCEEW, 2014). Given that the project proposes removal of less than 2.00 ha of potentially suitable habitat that has been significantly modified and disturbed by land use, in combination with lack of records in the assessment area, **the species is not likely to decline as a result of modifying, destroying, removing or decreasing the availability of habitat.**

g) Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the critically endangered or endangered species' habitat

The MNES Significant impact guidelines 1.1 states 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.

One of the listed threats to this species in the approved conservation advice is weed invasion and competition, particularly from exotic grasses (DCCEEW, 2014). Due to the absence of BioNet records, only partial presence of suitable habitat and degraded condition, it is unlikely this species would colonise in the subject land.

The proposed project has the potential to contribute to the spread of invasive species, mainly through the clearing of vegetation, in addition to potential transfer and introduction of both plant material and soil on machinery. Mitigation measures have been recommended in the BDAR to prevent the spread of weeds throughout the project area. **The proposed action would therefore be unlikely to result in invasive species that are harmful to this species becoming established in its potential habitat.**

h) Introduce disease that may cause the species to decline, or

This species is not susceptible to diseases that may cause it to decline (DCCEEW, 2014). **The proposed project is considered unlikely to result in the introduction of disease that may cause the species to decline.**

i) Interfere with the recovery of the species.

The proposed project would remove 2.00 ha of potential habitat for this species, of which 0.33 ha is woodland. Open woodland is preferred habitat for this species; however, the development footprint and surrounds is highly modified from grazing and cropping. There is no adopted or made Recovery Plan for this species (DCCEEW, 2025). Although no Recovery Plan exists for this species, the Saving our Species (SoS) program identifies priority actions for *Austrostipa wakoolica* and three priority management sites, none of which occur within the development footprint or wider subject land (NSW DPE, 2025). Considering these factors and the absence of observations within the development footprint and assessment area (BioNet, 2025), **the proposed project is highly unlikely to interfere with the recovery of this species due to these factors.**

j) Conclusion.

The proposed action is not likely to lead to a long-term decrease in the size of an *A. wakoolica* population, reduce its area of occupancy or fragment an existing population into two or more populations. It is not likely to adversely affect habitat critical to the survival of the species, disrupt the breeding cycle of a population or interfere with the recovery of the species. Due to the degraded condition of the landscape and that multiple key threats already impact the development footprint, the proposed action is not likely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline. With standard biosecurity protocols in place, the proposed action is not likely to

introduce disease that may cause the species to decline, or result in invasive species becoming established in the species' habitat. Recommended mitigation measures include:

- Vehicles and machinery to be checked for soil and plant matter and washed-down prior to entering the site
- Brushing and cleaning boots if walking through native vegetation.

Considering the above factors, **the proposed action is not likely to have a significant impact on *Austrostipa wakoolica*.**

1.2 Vulnerable species

The *Environment Protection and Biodiversity Conservation Act 1999* specifies factors to be considered in deciding whether a development is likely to significantly affect Endangered Ecological Communities, threatened species and migratory species, listed at the Commonwealth level. These assessments characterise the significance of likely impacts associated with the development on the following Vulnerable species:

Birds

- Brown Treecreeper (eastern subspecies) (*Climacteris picumnus victoriae*)
- Diamond Firetail (*Stagonopleura guttata*)
- Southern Whiteface (*Aphelocephala leucopsis*)
- White-throated Needletail (*Hirundapus caudacutus*)

Flora

- Yass Daisy (*Ammobium craspedioides*)

Insects

- Golden Sun Moth (*Synemon plana*)

Mammals

- Corben's Long-Eared Bat (*Nyctophilus corbeni*)

Reptiles

- Striped Legless Lizard (*Delma impar*)

Brown Treecreeper (eastern subspecies) (*Climacteris picumnus victoriae*)

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

a) Lead to a long-term decrease in the size of an important population of a species

The MNES Significant impact guidelines 1.1 states that an 'important population' is 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.

Climacteris picumnus victoriae is endemic to south-eastern Australia from the Grampians in western Victoria, through central NSW to the Bunya Mountains in Queensland, and from the coast to the inland slopes of Great Dividing Range. In NSW the western boundary of the range runs approximately through Corowa, Wagga Wagga, Temora, Forbes, Dubbo and Inverell (DCCEEW, 2023). It is found in eucalypt woodlands (including Box-Gum, stringybarks or other rough-barked eucalypts) and dry open forest of the inland slopes and plains inland of the Great Dividing Range. It mainly inhabits woodlands dominated with an open grassy understorey, sometimes with one or more shrub species. The species is also found in mallee and River Red Gum (*Eucalyptus camaldulensis*). They are also found in forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses. They are usually not found in woodlands with a dense shrub layer (DCCEEW, 2023).

Fallen timber is an important habitat component for foraging. They spend much more time foraging on the ground and fallen logs than other treecreepers, and nest and roost in naturally occurring tree cavities of eucalypts (DCCEEW, 2023).

The presence of *Climacteris picumnus victoriae* in the subject land has been assumed based on associated PCT 277 and PCT 76, and the presence of potential habitat. Of the total 2.00 ha of potential habitat proposed to be removed, 0.33 ha is woodland, and 1.67 ha is grassland. 1.85 ha of PCT 277 is present as low condition grassland, moderate-high condition woodland with native dominated understorey, and moderate condition woodland with exotic understorey due to past and present land use and related agricultural activities. PCT 76 is present as 0.15 ha or low condition grassland. No targeted surveys have been undertaken for this species; however the area of impact is adjacent to a current access track, which has previously been disturbed through track construction, edge effects and regular agricultural activities such as grazing and machinery movement. There is very little retained fallen timber within the subject land, minimising good quality foraging habitat within the subject land.

The most recent record of this species was observed in 2007 in Livingstone National Park, approximately 6.5 km from the subject land. There are 114 records of this species observed within 10 km of the subject land (in Livingstone National Park) from 1993 to 2007.

An important population is not considered to occur in the subject land, however it is important to note that an important population is likely present within 7.5 km in Livingstone National Park, based on the number of observed records. Livingstone National Park contains more intact and structurally diverse vegetation unlike the vegetation in the Subject Land.

Therefore, it is unlikely that the proposed action would lead to a long-term decrease in the size of an important population of the species.

b) Reduce the area of occupancy of an important population

In the subject land, 1.82 ha of woodland would be retained as part of the project, with an additional 30 ha in the locality. Woodland includes moderate-high condition areas with native dominated understorey, and moderate condition areas with exotic understorey due to past and present land use and related agricultural activities. In the study area (subject land), 1.29 ha of PCT 76 and 5.08 ha of PCT 277 are retained by the project.

The proposed action would reduce potential woodland habitat by 0.33 ha and grassland habitat by 1.67 ha. With the abundance of retained woodland in the locality, it is unlikely the reduction of 0.33 ha of potential habitat would significantly reduce the area of occupancy for the species. This also considers current land use which includes pastoral development and stock, resulting in grazing pressure, trampling and browsing. No individuals or population of this species have been observed in the subject land. **Considering these factors, the proposed project is not likely to reduce the area of occupancy of an important population.**

c) Fragment an existing important population into two or more populations

This species is highly mobile and has a wide distribution, and its movement would not likely be impacted through the installation of a BESS. It has not been recorded within the subject land and no known important populations are considered to occur within the subject land or assessment area. It is unlikely that increasing the existing access track from eight metres to 23 m at the widest points would significantly impact any important *C. picumnus victoriae* populations. In addition, potential retained habitat within the subject land consists of 4.55 ha of grassland and 1.82 ha of woodland. Therefore, **it is unlikely that the proposed action will fragment an existing important population into two or more populations.**

d) Adversely affect habitat critical to the survival of a species

Habitat critical to the survival of the *C. picumnus victoriae* includes areas that have:

- Relatively undisturbed grassy woodland with native understorey
 - 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.
 - The required degree of openness is mostly likely to be created by moderate levels of disturbance by fire and/or grazing.
- large living and dead trees which are essential for roosting and nesting sites and for foraging;
- fallen timber which provides essential foraging habitat and;
- hollows in standing dead or live trees and tree stumps are also essential for nesting.

(DCCEEW, 2023)

Habitat critical to the survival should not be cleared, fragmented or degraded. No critical habitat for this species is listed on the Register of Critical Habitat (DCCEEW, 2014). However, based on the above, habitat critical to the survival of the species is present and would be removed as part of the proposed action. Therefore, **the proposed action is likely to adversely affect 2.00 ha of habitat critical to the survival of the species, however the extent is minor in the context of the locality.**

e) Disrupt the breeding cycle of an important population

Breeding for this species occurs from July to February across its range, however there is not considered to be an important population within the subject land. **Therefore, it is unlikely the proposed action would disrupt the breeding cycle of an important population.**

f) 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 is a key threat to *C. picumnus victoriae* (DCCEEW, 2023). While the proposed work would remove 0.33 ha of woodland (including five Hollow-Bearing Trees (HBTs)) and 1.67 ha of grassland, 6.37 ha of potential habitat would be retained in the subject land. Within the locality, approximately 30 ha of adjacent suitable habitat (woodland) is being retained, in addition to 20 HBTs within the subject land.

Therefore, it is unlikely the that proposed work would modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.

g) Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat

The proposed action has the potential to contribute to the spread of invasive weed species in the subject land through the transfer and introduction of plant material and soil on machinery. Any removal of native plant species also presents opportunities for invasive species to establish where ground cover is exposed. The implementation of appropriate biosecurity practices will assist to prevent and control these impacts. With the implementation of these mitigation measures, the proposal is not considered likely to exacerbate this impact to the point that it would constitute a substantial reduction in the quality or integrity of the species habitat within the subject land.

A key threat to this species is predation from feral cats (*Felis catus*) and the European Red Fox (*Vulpes vulpes*) (DCCEEW, 2023). The European Red Fox is currently present within the subject land. The proposed project is considered unlikely to generate an increase in invasive fauna species harmful to the species, such as feral cats or foxes, above what is currently present. **The project is not considered likely to result in invasive species becoming established in potential *C. picumnus victoriae* habitat.**

Additionally, *C. picumnus victoriae* has not been recorded within the subject land or wider locality (BioNet, 2025).

h) Introduce disease that may cause the species to decline, or

C. picumnus victoriae is not at risk of any known diseases (DCCEEW, 2023). There is a risk that diseases could be introduced to the subject land via machinery, vehicles, and materials during construction and operation. With the implementation of the recommended mitigation measures, **the proposal is unlikely to result in the introduction of any disease that may cause these species to decline.**

i) Interfere substantially with the recovery of the species.

Although no Recovery Plan currently exists for *C. picumnus victoriae*, its Conservation Advice lists a range of conservation and management priorities, including the following:

- Cease all land clearing of habitat critical of the survival of the species
- Undertake revegetation, using a diverse mix of locally appropriate native species, focussing on expanding and connecting areas of existing habitat or widening wildlife corridors wherever possible. Where appropriate:
 - Replace cohorts of trees where they have been removed from the landscape, particularly in areas adjacent to and connecting woodland remnants.
 - Establish new habitat patches in areas where native vegetation cover is lacking.
 - Ensure ground cover is patchy with open areas for ground foraging
 - Target the productive lower parts of the landscape, especially areas adjacent to streams, which may provide important drought refuges. To maximise these benefits, riparian plantings should be at least 50 m wide.
- Promote ecological management and connectivity of woodland remnants on public and private land.

- Ensure populations remain connected. Avoid gaps greater than 100 m between trees (either between scattered paddock trees or in linear corridors). Eliminate gaps through revegetation, either corridors or stepping stone plantings, focusing on important movement pathways.
- Promote appropriate management of flow regimes in floodplains including initiatives to deliver water to icon sites on the Murray River, some of which may benefit this subspecies.

(DCCEEW, 2023)

In addition, 6.37 ha of potential habitat would remain within the subject land, as well as approximately 30 ha of woodland within the locality (including 20 HBTs). Total potential habitat retained within the locality is 171.52 ha, therefore removing 1.15% of potential habitat within the locality. This also considers that there are no species records within the subject land (BioNet, 2025). Considering these factors, **it is unlikely the impacts from the proposed action will substantially interfere with the recovery of the species.**

j) Conclusion.

Although the proposed action includes removal of habitat critical to the survival of *C. picumnus victorae* through clearing of 2.00 ha of potential foraging and breeding habitat, impacts are minor in the context of the locality. It is not likely to reduce the area of occupancy of an important population, lead to a long-term decrease in the size of a population, or fragment an existing important population into two or more populations. The 1.67 ha of low condition grassland in combination with 0.33 ha of woodland proposed to be cleared is unlikely to remove or decrease the availability of habitat to the extent that the species is likely to decline. The proposed action is not likely to disrupt the breeding cycle of an important population or interfere substantially with the recovery of the species. With standard biosecurity measures in place, it is unlikely that the project would introduce disease or result in the introduction or spread of invasive species suitable habitat. The approximate 6.37 ha of adjacent suitable habitat being retained within the subject land, including 20 HBTs, would be sufficient for foraging and breeding for *C. picumnus victorae* if it were to occupy the area. In addition, approximately 30 ha of woodland would be retained within the locality, as well as a total native vegetation area of 171.52 ha as potential habitat.

Mitigation measures are recommended to minimise impacts to this species and include:

- Vehicles and machinery to be checked for soil and plant matter and washed-down prior to entering the site
- Brushing and cleaning boots if walking through native vegetation
- Clear delineation of vegetation to be cleared or retained
- Marking of Tree Protection Zones (TPZs) during clearing phase of project

Considering the above factors, and with appropriate mitigation measures in place, **it is unlikely that the proposed action will have a significant impact on *C. picumnus victorae*.**

Diamond Firetail (*Stagonopleura guttata*)

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

a) Lead to a long-term decrease in the size of an important population of a species

The MNES Significant impact guidelines 1.1 states that an 'important population' is 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.

The presence of *Stagonopleura guttata* in the subject land has been assumed based on the presence of associated PCTs and suitable habitat. There are no known records within the Subject Land however targeted surveys during the breeding season have not been undertaken.

S. guttata occurs from south-east Queensland to the Eyre Peninsula in South Australia, and about 300 km inland from the sea. They occur in eucalypt, acacia or casuarina woodlands, open forests and other lightly timbered habitats, including farmland and grassland with scattered trees, preferring areas with very low tree density, few large logs, and little litter cover but high grass cover (DCCEEW, 2023). The species appears to be sedentary, however may move locally, and flocks are usually between 5 to 40 individuals. *S. guttata* is predominantly a ground forager, feeding on ripe and partly-ripe grass and herb seeds and green leaves, and on insects (particularly during the breeding season) (DCCEEW, 2023).

The presence of *S. guttata* in the subject land has been assumed based on associated PCT 277 and PCT 76, and the presence of potential habitat. Of the total 2.00 ha of potential habitat proposed to be removed, 0.33 ha is woodland, and 1.67 ha is low condition grassland. 1.85 ha of PCT 277 is present as low condition grassland, moderate-high condition woodland with native dominated understorey, and moderate condition woodland with exotic understorey due to past and present land use and related agricultural activities. PCT 76 is present as 0.15 ha of low condition grassland. No targeted surveys have been undertaken for this species; however the area of impact is adjacent to a current access track, which has previously been disturbed through track construction, edge effects and regular agricultural activities such as grazing and machinery movement.

As part of the proposal, the action would impact potential habitat including 2.00 ha as potential foraging and breeding habitat. Within the subject land, 6.37 ha of potential habitat would be retained, and 171.52 ha of potential habitat retained within the locality. There are no records of this species within the subject land or within 10 km of the subject land (BioNet, 2025).

In consideration of the above factors, **an important population is not considered to occur in the subject land and the proposed action is not likely to result in a long-term decrease in the size of an important *S. guttata* population.**

b) Reduce the area of occupancy of an important population

One of the key attributes that classifies a population as being important and necessary for a species' long-term survival and recovery include 'key source populations either for breeding or dispersal'.

According to the Conservation Advice for *S. guttata* (DCCEEW, 2023), the area of occupancy for the whole population of the species is approximately 25,000km². This is based on the number of 2 x 2km squares within which they have been recorded since 1990 (DCCEEW, 2023). The proposed action will impact 2.00 ha of potential suitable habitat for the species, which is approximately 0.02km², therefore reducing its

potential area of occupancy by < 0.001 %. An important population is also not considered to occur within the subject land. Therefore, the proposed action is unlikely to reduce the area of occupancy of an important population.
c) Fragment an existing important population into two or more populations
An important population of <i>S. guttata</i> is not considered to occur within the Subject Land and therefore is unlikely to be fragmented into two or more populations. This species is generally sedentary and has a wide distribution, and would not be likely to be impacted through the installation of a BESS. It is unlikely that increasing the existing access track from eight metres to 23 m at the widest points would significantly impact the species. In addition, potential retained habitat within the subject land consists of 4.55 ha of grassland and 1.82 ha of woodland. Therefore, it is unlikely that the proposed action will fragment an existing important population into two or more populations.
d) Adversely affect habitat critical to the survival of a species
Conservation Advice for <i>S. guttata</i> lists the following as habitat critical to the survival of the species: • Areas of eucalypt, acacia or casuarina woodlands, open forests and other lightly timbered habitats • Areas of low tree density, few large logs, and little litter cover but high grass cover for foraging, roosting and breeding • Drooping she-oak (<i>Allocasuarina verticillata</i>) within the Mt Lofty Ranges. (DCCEEW, 2023) No habitat critical to the survival of this species is listed on the Register of Critical Habitat (DCCEEW, 2014). Habitat critical to the survival should not be cleared, fragmented or degraded. No critical habitat for this species is listed on the Register of Critical Habitat (DCCEEW, 2014). However, based on the above description, habitat critical to the survival of the species is present and would be removed as part of the proposed action. Therefore, the proposed action is likely to adversely affect 2.00 ha of habitat critical to the survival of the species, however the extent is minor in the context of the locality.
e) Disrupt the breeding cycle of an important population
An important population of <i>S. guttata</i> is not considered to occur within the Subject Land and therefore the proposal is unlikely to have a disruption to the breeding cycle. <i>S. guttata</i> breeds between August and January, in nests that are bottle shaped and made of green grass blades and stems lined with fine grasses and feathers. Nests are often built into the base of a large stick-nest of a bird of prey such as a Wedge-tailed Eagle (<i>Aquila audax</i>) to safeguard the eggs. Nests are also built among the prickly foliage of shrubs such as hakeas, rose bushes and boxthorn. One clutch per season is laid, comprising of 4-5 eggs, and are incubated by both the male and female (DCCEEW, 2023). None of these features, large stick nests or shrubs occur within the subject land. Therefore, the proposed action is unlikely to disrupt the breeding cycle of an important population.
f) 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 is a key threat to <i>S. guttata</i> (DCCEEW, 2023). While the proposed work would remove 0.33 ha of woodland (including five Hollow-Bearing Trees (HBTs)) and 1.67 ha of grassland, 6.37 ha of potential

habitat would be retained in the subject land. Within the locality, approximately 30 ha of adjacent suitable habitat (woodland) is being retained, in addition to 20 HBTs within the subject land.

Therefore, it is unlikely the that proposed work would modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.

g) Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat

The Conservation Advice for *S. guttata* (DCCEEW, 2023) lists habitat degradation by overgrazing from rabbits (*Oryctolagus cuniculus*) as a threat to the species. Additionally, introduced predatory fauna species such as cats (*Felis catus*) and foxes (*Vulpes vulpes*) which may opportunistically prey on this species already occur within the locality. Foxes are currently present within the subject land.

An additional threat to the species is invasive weed species, specifically exotic annual grasses, which have the ability to change the floristic and structural characteristics of habitat. It is not predicted that the proposed action would result in an increase of the presence of these invasive species.

The proposed project has the potential to contribute to the spread of invasive species, mainly through the clearing of vegetation, in addition to potential transfer and introduction of both plant material and soil on machinery. Mitigation measures have been recommended in the BDAR to prevent the spread of weeds throughout the project area. With these biosecurity measures in place, **the proposed action is not likely to result in invasive species that are harmful to *S. guttata* becoming established in its habitat.**

h) Introduce disease that may cause the species to decline, or

Conservation Advice for *S. guttata* does not identify any diseases that may affect this species (DCCEEW, 2023). There is a risk that diseases could be introduced to the subject land via machinery, vehicles, and materials during construction and operation. With the implementation of the recommended mitigation measures, the **proposal is unlikely to result in the introduction of any disease that may cause these species to decline.**

i) Interfere substantially with the recovery of the species.

A recovery plan has been determined to be required for *S. guttata*, however has not been released at the time of this assessment (DCCEEW, 2023). In the interim, Conservation Advice for (DCCEEW, 2023) lists a primary conservation and recovery outcome for the species being:

- Maintain or increase current abundance and distribution.

There are several conservation and management priorities to achieve this. One of these priorities is to retain and protect woodland, open forest, grassland and mallee habitat from clearing, fragmentation and disturbance (DCCEEW, 2023). However, another priority is to undertake revegetation using a diverse mix of locally appropriate native species, which will produce high quality habitat (DCCEEW, 2023). Although the proposed action would remove 2.00 ha of suitable habitat, 6.37 ha of would remain within the subject land, as well as approximately 30 ha of woodland within the locality (including 20 HBTs). Total potential habitat retained within the locality is 171.52 ha, therefore removing 1.15% of potential habitat within the locality. This also considers that there are no species records within the subject land (BioNet, 2025). **Therefore, the action is unlikely to interfere substantially with the recovery of the species.**

j) Conclusion.

Although the proposed action includes removal of habitat critical to the survival of *S. guttata* through clearing of 2.00 ha of potential foraging and breeding habitat, impacts are minor in the context of the

locality. It is not likely to reduce the area of occupancy of an important population, lead to a long-term decrease in the size of a population, or fragment an existing important population into two or more populations. The 1.67 ha of low condition grassland in combination with 0.33 ha of woodland proposed to be cleared is unlikely to remove or decrease the availability of habitat to the extent that the species is likely to decline. The proposed action is not likely to disrupt the breeding cycle of an important population or interfere substantially with the recovery of the species. With standard biosecurity measures in place, it is unlikely that the project would introduce disease or result in the introduction or spread of invasive species suitable habitat. The approximate 6.37 ha of adjacent suitable habitat being retained within the subject land, including 20 HBTs, would be sufficient for foraging and breeding for *S. guttata* if it were to occupy the area. In addition, approximately 30 ha of woodland would be retained within the locality, as well as a total native vegetation area of 171.52 ha as potential habitat.

Mitigation measures are recommended to minimise impacts to this species and include:

- Vehicles and machinery to be checked for soil and plant matter and washed-down prior to entering the site
- Brushing and cleaning boots if walking through native vegetation
- Clear delineation of vegetation to be cleared or retained
- Marking of Tree Protection Zones (TPZs) during clearing phase of project

Considering the above factors, and with appropriate mitigation measures in place, **it is unlikely that the proposed action will have a significant impact on *Stagnopleura guttata*.**

Southern Whiteface (*Aphelocephala leucopsis*)

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

a) Lead to a long-term decrease in the size of an important population of a species

The MNES Significant impact guidelines 1.1 states that an 'important population' is 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.

The presence of *Aphelocephala leucopsis* in the subject land has been assumed based on the presence of potential suitable habitat. There is one record of this species within the locality, observed approximately 7.8 km in proximity from the Subject Land in 2007, in Livingstone National Park. There are no known records within the Subject Land however targeted surveys during the breeding season have not been undertaken.

A. leucopsis is known to occur across most of mainland Australia south of the tropics and is considered a sedentary species. Within NSW, the species occurs west of the Great Dividing Range (DCCEEW, 2023). *A. leucopsis* usually occur in habitat dominated by acacias or eucalypts on ranges, foothills and lowlands, and plains. They forage almost exclusively on the ground, favouring habitat with low tree densities and an herbaceous understorey litter cover (DCCEEW, 2023).

The presence of *A. leucopsis* in the subject land has been assumed based on associated PCT 277 and PCT 76, and the presence of potential habitat. Of the total 2.00 ha of potential habitat proposed to be removed, 0.33 ha is woodland, and 1.67 ha is grassland. 1.85 ha of PCT 277 is present as low condition grassland, moderate-high condition woodland with native dominated understorey, and moderate condition woodland with exotic understorey due to past and present land use and related agricultural activities. PCT 76 is present as 0.15 ha or low condition grassland. No targeted surveys have been undertaken for this species; however the area of impact is adjacent to a current access track, which has previously been disturbed through track construction, edge effects and regular agricultural activities such as grazing and machinery movement. There are no records of this species within the subject land or within 10 km of the subject land (BioNet, 2025)

As part of the proposal, the action would impact potential habitat including 2.00 ha as potential foraging and breeding habitat. Within the subject land, 6.37 ha of potential habitat would be retained, and 171.52 ha of potential habitat retained within the locality.

In consideration of the above factors, **an important population is not considered to occur and the proposed action is not likely to result in a long-term decrease in the size of an important *A. leucopsis* population.**

b) Reduce the area of occupancy of an important population

According to Conservation Advice for *A. leucopsis*, the area of occupancy for the whole population of the species is approximately 80,000km². This is based on the number of 2 x 2 km squares within which they have been recorded since 1990 (DCCEEW, 2023). No important populations are considered to occur within the subject land. Therefore, the removal of 2.00 ha of potential habitat would reduce its area of occupancy by less than 0.01%. **Therefore, the proposed action is unlikely to reduce the area of occupancy of an important population.**

c) Fragment an existing important population into two or more populations

An important population of *A. leucopsis* is not considered to occur within the Subject Land and therefore is unlikely to be fragmented into two or more populations. This species is generally sedentary and has a wide distribution, and would not be likely to be impacted through the installation of a BESS. It is unlikely that increasing the existing access track from eight metres to 23 m at the widest points would significantly impact on movement of the species. In addition, potential retained habitat within the subject land consists of 4.55 ha of grassland and 1.82 ha of woodland. Therefore, **it is unlikely that the proposed action will fragment an existing important population into two or more populations.**

d) Adversely affect habitat critical to the survival of a species

Conservation Advice for *A. leucopsis* (DCCEEW, 2023) lists the following as habitat critical to the survival of the species:

- Relatively undisturbed open woodlands and shrublands with an understorey of grasses or shrubs or both
- Habitat with low tree densities and an herbaceous understorey little cover which provides essential foraging habitat
- Living and dead trees with hollows and crevices which are essential for roosting and nesting.

Habitat critical to the survival should not be cleared, fragmented or degraded. No critical habitat for this species is listed on the Register of Critical Habitat (DCCEEW, 2014). However, based on the above description, habitat critical to the survival of the species is present and would be removed as part of the proposed action. Therefore, the proposed action is likely to adversely affect 2.00 ha of habitat critical to the survival of the species, however the extent is minor in the context of the locality.

e) Disrupt the breeding cycle of an important population

A. leucopsis breeds from July to October, however this timing can be affected by climatic conditions in certain areas. The species builds large, bulky domed nests of grass, bark and roots within a hollow or crevice, although sometimes a low bush may be used. Nesting is often observed to involve pairs, however, there have been occurrences of co-operative breeding with up to four adults participating in chick rearing (DCCEEW, 2023). An important population is not considered to occur within the subject land, **therefore the proposed action is not likely to disrupt the breeding cycle of an important population.**

f) 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 is a key threat to *A. leucopsis* (DCCEEW, 2023). While the proposed work would remove 0.33 ha of woodland (including five Hollow-Bearing Trees (HBTs)) and 1.67 ha of grassland, 6.37 ha of potential habitat would be retained in the subject land. Within the locality, approximately 30 ha of adjacent suitable habitat (woodland) is being retained, in addition to 20 HBTs within the subject land.

Therefore, it is unlikely the that proposed work would modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.

g) Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat

Conservation Advice (DCCEEW, 2023) for *A. leucopsis* does not list any invasive species as a key threat. The proposed project has the potential to contribute to the spread of invasive species, mainly through the

clearing of vegetation, in addition to potential transfer and introduction of both plant material and soil on machinery. Mitigation measures have been recommended in the BDAR to prevent the spread of weeds throughout the project area. With these biosecurity measures in place, **the proposed action is not likely to result in invasive species that are harmful to *A. leucopsis* becoming established in its habitat.**

h) Introduce disease that may cause the species to decline, or

Conservation Advice for *A. leucopsis* does not identify any diseases that may affect the species (DCCEEW, 2023). There is a risk that diseases could be introduced to the subject land via machinery, vehicles, and materials during construction and operation. With the implementation of the recommended mitigation measures, the **proposal is unlikely to result in the introduction of any disease that may cause these species to decline.**

i) Interfere substantially with the recovery of the species.

There is currently no recovery plan for this species, however there are several conservation and recovery actions outlined within the Conservation Advice including (DCCEEW, 2023):

- Cease all land clearing of habitat critical to the survival of *A. leucopsis*.
- Secure occupied habitat patches in areas where the birds have a patchy distribution from further degradation and loss.
- Undertake revegetation, using a diverse mix of locally appropriate native species, focussing on expanding and connecting areas of existing habitat or widening wildlife corridors wherever possible. Where appropriate:
 - Establish new habitat patches in areas where native vegetation cover is lacking.
 - Target the productive lower parts of the landscape which may provide important drought refuges. To maximise these benefits, riparian plantings should be at least 50m wide.
- Promote ecological management and connectivity of woodland remnants on public and private land.
- Promote the uptake of agriculture and biodiversity stewardship programs to retain Southern Whiteface habitat.

Although the proposed action would remove 2.00 ha of suitable habitat, 6.37 ha of would remain within the subject land, as well as approximately 30 ha of woodland within the locality (including 20 HBTs). Total potential habitat retained within the locality is 171.52 ha, therefore removing 1.15% of potential habitat within the locality. This also considers that there are no species records within the subject land (BioNet, 2025). **Therefore, the action is unlikely to interfere substantially with the recovery of the species.**

j) Conclusion.

Although the proposed action includes removal of habitat critical to the survival of *A. leucopsis* through clearing of 2.00 ha of potential foraging and breeding habitat, impacts are minor in the context of the locality. It is not likely to reduce the area of occupancy of an important population, lead to a long-term decrease in the size of a population, or fragment an existing important population into two or more populations. The 1.67 ha of low condition grassland in combination with 0.33 ha of woodland proposed to be cleared is unlikely to remove or decrease the availability of habitat to the extent that the species is likely to decline. The proposed action is not likely to disrupt the breeding cycle of an important population or interfere substantially with the recovery of the species. With standard biosecurity measures in place, it is unlikely that the project would introduce disease or result in the introduction or spread of invasive species suitable habitat. The approximate 6.37 ha of adjacent suitable habitat being retained within the subject

land, including 20 HBTs, would be sufficient for foraging and breeding for *S. guttata* if it were to occupy the area. In addition, approximately 30 ha of woodland would be retained within the locality, as well as a total native vegetation area of 171.52 ha as potential habitat.

Mitigation measures are recommended to minimise impacts to this species and include:

- Vehicles and machinery to be checked for soil and plant matter and washed-down prior to entering the site
- Brushing and cleaning boots if walking through native vegetation
- Clear delineation of vegetation to be cleared or retained
- Marking of Tree Protection Zones (TPZs) during clearing phase of project

Considering the above factors, and with appropriate mitigation measures in place, **it is unlikely that the proposed action will have a significant impact on *A. leucopsis*.**

White-throated Needletail (*Hirundapus caudacutus*)

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

a) Lead to a long-term decrease in the size of an important population of a species

The MNES Significant impact guidelines 1.1 states that an 'important population' is 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.

The presence of *Hirundapus caudacutus* in the subject land has been assumed based on the presence of suitable habitat. There are no known records within the Subject Land however targeted surveys during the breeding season have not yet been undertaken.

Approved Conservation Advice for this species states 'In Australia, the White-throated Needletail is mostly aerial, from heights of less than 1 m up to more than 1,000 m above the ground. Although they occur over most types of habitat, 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. When flying above farmland, they are more often recorded above partly cleared pasture, plantations or remnant vegetation at the edge of paddocks.' (Threatened Species Scientific Committee, 2019). Potential suitable habitat in the Involved Lots includes habitat consisting of grassland and woodland. *H. caudacutus* is associated with PCT 76 and PCT 277, which was identified within the subject land.

Within the development footprint, 0.33 ha of potential woodland habitat and 1.67 ha of potential grassland habitat for this species is proposed to be removed as part of the project. This includes five Hollow-Bearing Trees (HBTs). While a total of 2.00 ha of potential habitat would be removed, 1.82 ha of woodland (including 20 HBTs) and 4.55 ha of grassland would be retained within the subject land. In addition, approximately 30 ha of woodland would be retained within the locality. 171.52 ha of native vegetation as potential habitat would remain in the locality, thereby reducing its potential habitat in the locality by 1.15%

Important habitat for this species is defined as non-breeding habitat only, in wooded areas (Threatened Species Scientific Committee, 2019). The habitat within the Subject Land is therefore considered important habitat for the species. However, the 1.67 ha of grassland to be removed is in low condition, and 0.33 ha of woodland is in moderate to high conditions.

The species' total population is not known; they do not occur as smaller populations in Australia (DCCEEW, 2025). An important population may occur in the subject land when migrating and foraging. However, due to the small area of potential habitat being cleared in proximity to the wider locality (1.15%) and lack of records within 10 km of the subject land (BioNet, 2025), **it is unlikely that the proposed action would lead to a long-term decrease in the size of an important population of the species.**

b) Reduce the area of occupancy of an important population

Within Australia, the population of *H. caudacutus* has not been quantified since meeting the criteria for Vulnerable listing under the EPBC Act <10,000 mature individuals (Threatened Species Scientific Committee, 2019). The species is migratory and is therefore likely to be considered a single population with the Australian distribution estimated to have an area of occupancy of around 126,200km² (DCCEEW, 2025). Therefore, all occurrences of this species are considered to be part of an important habitat. However, the proposed action would reduce the potential area of occupancy by less than 0.0001%, and there are no known observations within the subject land (BioNet, 2025).

The proposal is likely to impact 2.00 ha of potential foraging habitat, although 171.52 ha would remain within the locality. As the subject land falls outside of core breeding areas and that 98.85% of potential foraging habitat would be retained within the locality, it is unlikely that the proposed works would reduce the area of occupancy of an important population.
c) Fragment an existing important population into two or more populations
<i>H. caudacutus</i> has not been recorded within the subject land or within 10 km of the subject land. Since this species is highly mobile, it is unlikely that the construction of a BESS and associated track widening would further increase fragmentation of the species. Therefore, it is unlikely that the proposed action will fragment an existing important population into two or more populations.
d) Adversely affect habitat critical to the survival of a species
Critical habitat has not been defined for this species. Therefore, all habitat is considered to be important. Important habitat for this species is associated with generally associated with large tracts of native vegetation, particularly forests (Threatened Species Scientific Committee, 2019). No habitat critical to the survival of this species is listed in its Approved Conservation Advice (Threatened Species Scientific Committee, 2019), or on the Register of Critical Habitat (DCCEEW, 2014). Potential retained habitat within the subject land consists of 5.08 ha of PCT 277 and 1.29 ha of PCT 76. 0.33 ha of woodland and 1.67 ha of low condition grassland suitable for this species is proposed to be removed. In the wider locality, 171.52 ha of potential habitat would remain in the landscape. Therefore, the proposed action is likely to adversely affect habitat critical to the survival of this species. However, this is considered to be minor in the context of the locality.
e) Disrupt the breeding cycle of an important population
This species does not breed within Australia, migrating to and breeding within Asia (Threatened Species Scientific Committee, 2019). No impact to the breeding cycle would occur as a result of the proposed action. The subject land is not within the breeding area of the species. With consideration of these factors, the proposal is unlikely to disrupt the breeding cycle of an important population.
f) Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
The proposal is likely to impact 2.00 ha of potential habitat for this species resulting in a long-term decrease in the availability and quality of potential foraging and roosting habitat for this species, however, due to the largely aerial nature of this species and the habitat present not being considered important habitat, it is not expected that the proposal would result in the decline of this species. There would also be 171.52 ha of potential habitat retained within a 1500 m radius of the subject land. Given that the project proposes removal of 2.00 ha of potentially suitable habitat that has been significantly modified and disturbed by land use, in combination with lack of records within the subject land or within 10 km of the subject land, the species is not likely to decline as a result of modifying, destroying, removing or decreasing the availability of habitat.
g) Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat
Invasive species that are harmful to <i>H. caudacutus</i> becoming established in its habitat include the Common Starling (<i>Sturnus vulgaris</i>) and Noisy Miner (<i>Manorina melanocephala</i>) which compete for roosting habitat, becoming more present and reduce the ability of <i>H. caudacutus</i> to become established

within the potential suitable habitat (Threatened Species Scientific Committee, 2019). Likewise, the proposed work is unlikely to increase the presence of feral cats.

The proposed project has the potential to contribute to the spread of invasive species, mainly through the clearing of vegetation, in addition to potential transfer and introduction of both plant material and soil on machinery. Mitigation measures have been recommended in the BDAR to prevent the spread of weeds throughout the project area.

Additionally, *H. caudacutus* has not been recorded within the subject land or wider locality and therefore it is unlikely that the proposed work will result in invasive species that are harmful to *H. caudacutus* becoming established in its suitable habitat (BioNet, 2025).

h) Introduce disease that may cause the species to decline, or

There is a risk that diseases could be introduced to the subject land via machinery, vehicles, and materials during construction and operation. With the implementation of the recommended mitigation measures, the proposal is unlikely to result in the introduction of any disease that may cause these species to decline.

i) Interfere substantially with the recovery of the species.

No recovery plan has been completed for this species. The following conservation actions are provided within its Approved Conservation Advice (Threatened Species Scientific Committee, 2019):

Primary conservation actions

Work with governments in East Asia to minimise destruction of key breeding habitats. Important habitats in Australia are identified and protected.

Conservation and Management priorities

- *Habitat loss and modifications*
 - *Seek the support of governments in East Asia to protect remaining old growth forests within the breeding range of the species.*
 - *Identify requirements of important habitat in Australia*
 - *Support initiatives to improve habitat management at key sites in Australia.*

Stakeholder Engagement

- *Through the bilateral migratory bird consultative meetings with the Governments of Japan, China and the Republic of Korea, raise awareness of the conservation of White-throated Needletail.*
- *Promote the conservation, and raise the profile, of White-throated Needletail through strategic programs and educational products.*
- *Promote the exchange of information between governments, NGOs and communities through use of networks, publications and websites.*

Survey and Monitoring priorities

- *Enhance existing White-throated Needletail monitoring programs, such as BirdLife Australia's Swift Monitoring Sites, particularly to improve coverage in under surveyed parts of Australia.*

Information and Research priorities

- *Use remote sensing to assess the extent of habitat loss at the breeding grounds.*
- *Undertake work to more precisely assess White-throated Needletail life history, population size, distribution and ecological requirements in Australia.*
- *Improve knowledge about potential threatening processes including the impacts of infrastructure (i.e. wind turbines and overhead wires).*
- *Quantify levels of organochlorines in individuals and prey species.*

The proposal will result in the reduction of potential foraging habitat for this species, which is unlikely to interfere with the recovery of *H. caudacutus* if present within the locality, due to the abundance of suitable potential habitat (171.52 ha) in the locality. The proposal is not likely to interfere substantially with the overall recovery objectives for this species outlined within the Approved Conservation Advice (Threatened Species Scientific Committee, 2019).

This species is highly mobile, and unlikely to be significantly impacted by the reduction of 2.00 ha of potential habitat from the edges of an existing access track. Considering these factors, it is unlikely the impacts from the proposed action will substantially interfere with the recovery of the species. This is due to not only due to the adjacent vegetation as potential habitat, but also considers that there are no species records within the subject land, or within 10 km of the subject land (BioNet, 2025). **Therefore, the proposed action is not likely to substantially interfere with the recovery of the species.**

j) Conclusion.

The proposed action is not likely to lead to a long-term decrease in the size of an important *H. caudacutus* population, reduce its area of occupancy or fragment an existing important population into two or more populations. It is not likely to adversely affect habitat critical to the survival of the species, disrupt the breeding cycle of a population or interfere with the recovery of the species. Due to the degraded condition of the landscape and that multiple key threats already impact the development footprint, the proposed action is not likely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline. With standard biosecurity protocols in place, the proposed action is not likely to introduce disease that may cause the species to decline, or result in invasive species becoming established in the species' habitat. Recommended mitigation measures include:

- Vehicles and machinery to be checked for soil and plant matter and washed-down prior to entering the site
- Brushing and cleaning boots if walking through native vegetation.

Considering the above factors, **the proposed action is not likely to have a significant impact on *Hirundapus caudacutus*.**

Yass Daisy (*Ammobium craspedioides*)

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

a) Lead to a long-term decrease in the size of an important population of a species

The MNES Significant impact guidelines 1.1 states that an 'important population' is 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.

The presence of *Ammobium craspedioides* in the subject land has been assumed based on the presence of associated PCTs and local records. No known records occur within the subject land, although no targeted surveys have yet been undertaken.

A. craspedioides occurs within the Murrumbidgee and Lachlan Natural Resource Management Regions within NSW. It is known from localities in NSW near Crookwell on the southern tablelands, to Wagga Wagga on the south western slopes (DEWHA, 2008). The closest record is a small population that exists in Livingstone National Park, approximately 7.5 km northeast of the subject land. BioNet records show four sightings of individuals – in 1992, 1998, 1999 and 2005 (BioNet, 2025) in Livingstone National Park.

A. craspedioides inhabits dry forest, Box-Gum Woodland and secondary grassland derived from clearing of these communities. It grows in association with a range of eucalypts, including: (*Eucalyptus blakelyi*, *E. bridgesiana*, *E. dives*, *E. goniocalyx*, *E. macrorhyncha*, *E. mannifera*, *E. melliodora*, *E. polyanthemos* and *E. rubida*). Two associated eucalypts were observed within the subject land including *E. blakelyi* and *E. melliodora*.

Distribution of this species overlaps with the *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* ecological community, of which 0.22 ha is proposed to be removed from the western area of the subject land.

Although there are existing records of this species observed within 10 km of the subject land (BioNet, 2025), it is unlikely the proposed action would impact the *A. craspedioides* population in Livingstone National Park. The four records are approximately 7.5 km northeast from the subject land, in Livingstone National Park. No targeted surveys have been undertaken for this species; however the area of impact is adjacent to a current access track, which has previously been disturbed through track construction, edge effects and regular agricultural activities such as grazing and machinery movement. This combination of land use activity and threats result in low likelihood of this habitat supporting an *A. craspedioides* population.

Based on these factors discussed above, an important population is **not** considered to occur within the Subject Land. This is due to the absence of key source populations for breeding or dispersal and general absence of population that are necessary for maintaining genetic diversity or near the limit of its range.

Therefore, the proposed project would not lead to a long-term decrease in the size of an *Ammobium craspedioides* important population.

b) Reduce the area of occupancy of an important population

As part of the proposal, the area of impact of potential habitat for this species is 2.00 ha, including 1.85 ha of PCT 277 and 0.15 ha of PCT 76. The majority of this area (83.7 %) is low condition grassland (1.67 ha), adjacent to existing and frequently utilised access tracks. Approximately 30 ha of woodland would remain within the locality, therefore reducing the extent of woodland by less than two percent.

Due to the degraded condition of grassland in the development footprint and lack of known records within the locality, it is unlikely that an important population occurs within the subject land. **Considering these factors, the proposed project is not likely to significantly reduce the area of occupancy of an important population.**

c) Fragment an existing important population into two or more populations

There are no known or existing populations of this species within the subject land, however there is a known important population in the Livingstone National Park, approximately 7.5 km northeast of the subject land (BioNet, 2025). Due to the degraded condition of vegetation along the existing track edge and current grazing pressure, it is unlikely that suitable habitat would appropriately support an important population of this species. **Therefore, the project is unlikely to cause fragmentation of an existing important population into two or more populations of this species.**

d) Adversely affect habitat critical to the survival of a species

The MNES Significant impact guidelines 1.1 states '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

No habitat critical to the survival of this species is listed in its Approved Conservation Advice (DEWHA, 2008), or on the Register of Critical Habitat (DCCEEW, 2014). There is no existing recovery plan for this species (DCCEEW, 2025).

This development footprint is not considered critical habitat for this species as it is highly disturbed by grazing, herbicides, historic clearing, trampling and other agricultural activities. It is highly unlikely to support any populations of this species due to the nature of its associated land use and degraded condition, therefore is not classified as habitat critical to the survival of the species.

Due to the degraded condition of vegetation along the existing track edge, current grazing pressure and agricultural activities, it is unlikely that the Subject Land would appropriately support the occupancy of this species. **Therefore, the project would not adversely affect habitat critical to the survival of this species.**

e) Disrupt the breeding cycle of an important population

There are no known or existing populations or important populations of this species within the subject land. The important population in Livingstone National Park is 7.5 km northeast of the subject land, and is unlikely to be affected by the proposed action. This species flowers during spring, from September to November (BioNet, 2025). Due to the degraded condition of vegetation along the existing track edge and current grazing pressure, it is unlikely that suitable habitat would appropriately support an important

population of this species. The project is unlikely to disrupt the breeding cycle of an important population of <i>Ammobium craspedioides</i>.
f) Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
The proposed project includes removal of 2.00 ha potential habitat for this species, including 1.85 ha of PCT 277 and 0.15 ha of PCT 76. This species occurs in dry forest, Box-Gum Woodland and secondary grassland derived from clearing of these communities (DEWHA, 2008). The project proposes to remove 0.33 ha of woodland (PCT 277) from the development footprint, of which 0.22 ha is confirmed as the <i>White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland</i> (Box-Gum Woodland) ecological community. Due to the disturbed condition of the of the grassland in the development footprint and subject land, in combination, it is unlikely that this species would colonise the project area. This considers current land use which includes pastoral development and livestock, resulting in grazing pressure and presence of exotic grasses and weeds. The main identified threats to this species are related to agricultural development and related activities. With the development footprint currently being used for agriculture, resulting in trampling, weed invasion, grazing, mowing and slashing, the potential habitat overall is not likely of suitable quality for the Yass Daisy to colonise. Given that the project proposes removal of less than 2.00 ha of potentially suitable habitat that has been significantly modified and disturbed by past land use, in combination with lack of records in the assessment area, the species is not likely to decline as a result of modifying, destroying, removing or decreasing the availability of habitat.
g) Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat
One of the listed threats to this species in the approved conservation advice is weed invasion, particularly by Serrated Tussock (<i>Nassella trichotoma</i>), Scotch Thistle (<i>Onopordum acanthium</i>) and St John's Wort (<i>Hypericum perforatum</i>) (DEWHA, 2008). St John's Wort is common throughout the Subject Land. The closest known record of this species is 7.5 km northeast of the subject land (BioNet, 2025). With previous disturbance of grassland areas and current presence of weeds such as St John's Wort throughout the subject land, it is unlikely <i>A. craspedioides</i> would colonise the area. The proposed project has the potential to contribute to the spread of further invasive species, mainly through the clearing of vegetation, in addition to potential transfer and introduction of both plant material and soil on machinery. Mitigation measures have been recommended in the BDAR to prevent the spread of weeds throughout the project area. The proposed action would therefore be unlikely to result in invasive species that are harmful to this species becoming established in its potential habitat.
h) Introduce disease that may cause the species to decline, or
This species is not susceptible to any known diseases that may cause it to decline (DEWHA, 2008). The proposal is considered unlikely to result in the introduction of disease that may cause the species to decline.
i) Interfere substantially with the recovery of the species.
The proposal would remove 2.00 ha of potential habitat for this species, of which 0.33 ha is woodland. Open woodland is preferred habitat for this species; however, the development footprint and surrounds is highly modified from grazing and cropping. There is no adopted or made Recovery Plan for this species (DCCEEW, 2025). Although no Recovery Plan exists for this species, the Saving our Species (SoS) program identifies three priority actions for <i>A. craspedioides</i> and species occurrence across NSW, none of which occur within the development footprint or subject land (NSW DPE, 2025). Considering these factors

and the absence of observations within the development footprint and wider assessment area (BioNet, 2025), **the proposed project is unlikely to interfere with the recovery of this species.**

j) Conclusion.

The proposed action is not likely to lead to a long-term decrease in the size of an important *Ammobium craspedioides* population, reduce its area of occupancy or fragment an existing important population into two or more populations. It is not likely to adversely affect habitat critical to the survival of the species, disrupt the breeding cycle of a population or interfere with the recovery of the species. Due to the degraded condition of the landscape and that multiple key threats already impact the development footprint, the proposed action is not likely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline. With standard biosecurity protocols in place, the proposed action is not likely to introduce disease that may cause the species to decline, or result in invasive species becoming established in the species' habitat. Recommended mitigation measures include:

- Vehicles and machinery to be checked for soil and plant matter and washed-down prior to entering the site
- Brushing and cleaning boots if walking through native vegetation.

Considering the above factors, **the proposed action is not likely to have a significant impact on *Ammobium craspedioides*.**

Corben's Long-eared Bat (*Nyctophilus corbeni*)

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

a) Lead to a long-term decrease in the size of an important population of a species

The MNES Significant impact guidelines 1.1 states that an 'important population' is 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.*

Nyctophilus corbeni was determined to be 'potentially present' within the subject land through Anabat detectors placed at five farm dam locations.

Nyctophilus corbeni is distributed in south-eastern Australia around the Murray-Darling Basin. Key populations are known from the Pillaga scrub (Threatened Species Scientific Committee, 2015), with no known records of the species within at least 10 km of the subject land (BioNet, 2025).

No important populations are known within the subject land or within a 1500 m radius of the subject land (Threatened Species Scientific Committee, 2015). The subject land falls within the distribution of this species, where species or species habitat may occur (DCCEEW, 2025). It is possible that the species could be using the subject land and surrounds, however this could not be confirmed through ultrasonic call analysis.

Preferred woodland habitat includes extensive stands of vegetation, as opposed to smaller patches of woodland (NSW DPE, 2025). In NSW, this species is distinctly more common in Box / Ironbark / Cypress-pine vegetation that occurs in a north-south belt along the western slopes and plains (NSW DPE, 2025). This vegetation is not present within the Subject Land. Non preferred habitat, - 0.32 ha of Grey Box Woodland (PCT 76) was confirmed within the subject land and is directly adjacent to the development footprint. This potential foraging and roosting habitat is part of a wider patch of PCT 76, with approximately 5.53 ha of this retained within 1500 m of the subject land.

Based on these factors discussed above, an important population is **not** considered to occur within the Subject Land. The subject land falls where species or species habitat may occur, under its federally listed distribution, with its known distribution approximately 30 km north of the subject land (DCCEEW, 2025).

In addition, the subject land is not a key source population for breeding or dispersal, it is unlikely to be providing populations to maintain genetic diversity. Given the above factors, **it is unlikely that the proposed action would lead to a long-term decrease in the size of an important *N. corbeni* population.**

b) Reduce the area of occupancy of an important population

This species can be found in a wide range of inland woodland vegetation types. These include:

- Box / Ironbark / Cypress Pine woodlands
- Buloke woodlands
- Brigalow woodland
- Belah woodland
- Smooth-barked Apple woodland

- River Red Gum forest
- Black Box woodland
- Various types of tree mallee.

(Threatened Species Scientific Committee, 2015)

In NSW, it is distinctly more common in Box / Ironbark / Cypress-Pine vegetation that occurs along the western slopes and plains. The species is also more abundant in extensive stands of vegetation in comparison to smaller woodland patches. Corben's Long-eared Bat can be found under bark and dry fissures in branches and utilises tree hollows as maternity sites (Threatened Species Scientific Committee, 2015). Although preferred woodland habitat was not found within the development footprint, 0.32 ha of Grey Box Woodland (PCT 76) was confirmed within the subject land and is directly adjacent to the development footprint, however, would not be impacted by the proposal.

Potential habitat to be impacted is associated with 0.15 ha of low condition derived grassland of PCT 76 within the development footprint. There are five Hollow-Bearing Trees (HBTs) found within the development footprint that are associated with PCT 277, with two being Yellow Box trees. Within the subject land, 20 HBTs are being retained as part of the project, of which six are Grey Box and five are Yellow Box. Within the wider 1500 m radius of the subject land, approximately 5.53 ha of PCT 76 would remain. Therefore, only removing 2.6% of grassland within this PCT in the locality. Although the potential area of occupancy would be reduced, the action would remove 0.15 ha of grassland from PCT 76 in low condition. In addition, no important populations is considered to occur within the subject land. **Therefore, the proposed actioned is not likely to reduce the area of occupancy of any important populations.**

c) Fragment an existing important population into two or more populations

N. corbeni is a highly mobile species with a scattered distribution. The removal of 0.15 ha of PCT 76 would be unlikely to impede movement of *N. corbeni* across its distribution range. There are no known or important populations of this species considered to occur within the subject land, **therefore it is unlikely the project would fragment an important populations of this species into two or more populations.**

d) Adversely affect habitat critical to the survival of a species

No habitat critical to the survival of this species is listed in its Approved Conservation Advice (DCCEEW, 2014), or on the Register of Critical Habitat (DCCEEW, 2025). There is no existing recovery plan for this species (DCCEEW, 2025). No habitat critical to the survival of *N. corbeni* has been declared. Therefore, the development footprint and subject land is not considered critical habitat for this species.

The proposal is unlikely to significantly fragment vegetation patches of woody vegetation required by the species, as the vegetation associated with the species to be removed, is a low condition grassland. Additionally, 5.53 ha of Grey Box Woodland is found within the locality and would be retained as part of the project. Therefore, the project is not likely to adversely affect habitat critical to the survival of this species.

e) Disrupt the breeding cycle of an important population

The species is a nomadic species that inhabits a variety of vegetation types, including mallee, Buloke (*Allocasuarina luehmannii*) and box eucalypt dominated communities. It utilises tree-hollows as maternity sites and mating takes place in autumn with one or two young born in late spring to early summer. Studies in NSW found maternity roosting sites in Ironbark, Buloke and Cypress Pine trees, which are not found within the Assessment Area (Threatened Species Scientific Committee, 2015).

There is little available information on the species' reproductive biology, however breeding is likely to be seasonal, with previously trapped pregnant and lactating females caught in November (Threatened Species Scientific Committee, 2015). As no preferred roosting habitat is present within the subject land, it

is unlikely that there will be a disruption to the breeding cycle of an important population of Corben's Long-eared Bat.
f) Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
Within the proposed development footprint, 0.15 ha of PCT 76 was identified as low condition grassland as potential foraging habitat for the species. There is, however, 0.32 ha of Grey Box Woodland outside of the development footprint that would be suitable roosting and foraging habitat for the <i>N. corbeni</i>. Within the wider 1500 m radius of the project, 5.53 ha of PCT 76 would remain within the landscape. Additionally, multiple key threatening processes already impact the potential habitat due to grazing, presence of feral animals and exposure to agrichemicals. Given that the project proposes removal of 0.15 ha of PCT 76, in which the habitat is low condition grassland that has been significantly modified and disturbed by land use, the species is not likely to decline as a result of modifying, destroying, removing or decreasing the availability of habitat.
g) Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat
<i>N. corbeni</i> may be subject to predation by feral species, and competition for hollows by invasive species such as the Common Starling (<i>Sturnus vulgaris</i>) and the introduced Honeybee (<i>Apis mellifera</i>), although impacts are not well known (Threatened Species Scientific Committee, 2015). The proposed project has the potential to contribute to the spread of invasive species, mainly through the clearing of vegetation, in addition to potential transfer and introduction of both plant material and soil on machinery. Mitigation measures have been recommended in the BDAR to prevent the spread of weeds throughout the project area. The proposed action would therefore be unlikely to result in invasive species that are harmful to this species becoming established in its potential habitat.
h) Introduce disease that may cause the species to decline, or
There is a risk that the proposal may introduce diseases into the subject land via machinery, vehicles, and materials during construction and operation. However, with the effective implementation of the mitigation measures detailed in the BDAR, the risk to <i>N. corbeni</i> habitat as a result of introduced diseases are not considered significant. Therefore, the proposed action is not likely to introduce disease that may cause the species to decline.
i) Interfere substantially with the recovery of the species.
There is no Recovery Plan for this species (DCCEEW, 2025), however Saving Our Species (SoS) program in NSW lists priority actions and management actions for the species across the state (Threatened Species Scientific Committee, 2015). This SoS strategy aims to manage conservation for this species primarily at the landscape scale and recognises that the occurrence of this species is aligned with the availability of hollow-bearing trees and specific vegetation communities, such as box / ironbark and cypress pine. Actions for the species in the recovery plan include: A Saving our Species (SoS) strategy exists for Corben's Long-eared Bat which aims to ensure that the species is secure in the wild in NSW, that its NSW geographic range is extended or maintained, and that its conservation status under the BC Act is maintained. Actions for the species include: • Encourage land managers to enter into land management agreements that protect and restore key areas. • Raise awareness among landholders about the importance of retaining large living and standing dead hollow-bearing trees in the landscape as habitat for the species.

- Raise awareness amongst landholders in close proximity (approximately 15 km radius) to maternity or roost sites, of the potential impacts of using harmful pesticides, herbicides, and other chemicals and discourage their use in or adjacent to foraging habitat.
- Liaise with relevant authorities or land managers to ensure that the location and sensitivity of roosts/overwintering sites (such as hollow-bearing trees and under bark) and key foraging areas are known prior to any hazard reduction burns. Ensure that areas immediately surrounding maternity and roost sites are identified as an important biodiversity asset in any relevant fire planning and have a 100m buffer zone applied. Planned fires near maternity or roosting sites should not be undertaken during the breeding season, i.e., October to January, or during winter when bats are in residence. Hazard reduction burns in box/ironbark/cypress pine vegetation communities where the bats are known or suspected of using should not occur more than once every 20–50 years. Liaise with the Rural Fire Service, National Parks and Wildlife Service, or relevant land manager, to ensure that prescribed burns that may affect habitat are cool burns and/or do not kill hollow-bearing trees or remove cohorts of smaller hollow-bearing species over large areas.
- Liaise with relevant authorities and/or land managers to ensure that the location and sensitivity of roosting and key foraging areas are known and encourage that existing lighting and noise impacting on these areas be modified and that any future lighting or noise avoid spilling onto these areas where possible.
- Raise public awareness of the damage caused to habitat by thinning, slashing, under scrubbing and inappropriate grazing, and firewood collection. Encourage land managers to retain tree density and a floristically and structurally diverse and spatially variable mid and understory.

(NSW DPE, 2025)

The development footprint contains only five hollow-bearing trees, of which two are Yellow Boxes. Within the wider subject land 20 HBTs are being retained, of which six are Grey Box and five are Yellow Box. Within the subject land, 0.32 ha of Grey Box Woodland would be retained, with 5.53 ha of the associated PCT 76 also retained within 1500 m of the project area. In consideration of these factors, it is unlikely that the proposed action will substantially interfere with the recovery of the species.

Noise and light pollution may also be temporary impacts during construction; however, these are not considered to cause substantial interference if conducted during daytime hours.

j) Conclusion.

The proposed action is not likely to lead to a long-term decrease in the size of an important *N. corbeni* population, reduce the area of occupancy an important population or fragment an existing important population into two or more populations. It is not likely to adversely affect habitat critical to the survival of the species, disrupt the breeding cycle of an important population or substantially interfere with the recovery of the species. Due to the degraded condition of the grassland and that multiple key threats already impact the development footprint, the proposed action is not likely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline. This also considers that 0.32 ha of Grey Box Woodland would remain within the subject land, and 5.53 ha of associated PCT 76 would be available to *N. corbeni* within a 1500 m radius of the site. With standard biosecurity protocols in place, the proposed action is not likely to introduce disease that may cause the species to decline. Recommended mitigation measures to prevent the introduction of new weeds and spread of existing weeds include:

- Vehicles and machinery to be checked for soil and plant matter and washed-down prior to entering the site
- Brushing and cleaning boots if walking through native vegetation

Considering the above factors, **the proposed action is not likely to have a significant impact on *Nyctophilus corbeni*.**

Golden Sun Moth (*Synemon plana*)

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

a) Lead to a long-term decrease in the size of an important population of a species

The MNES Significant impact guidelines 1.1 states that an 'important population' is 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.

The presence of *Synemon plana* in the subject land has been assumed based on associated PCTs and the presence of potential habitat. Distribution mapping shows the development footprint and subject land occurs just outside where this species or species habitat may occur (DCCEEW, 2025). There are no known records within the subject land, or within 10 km of the subject land for this species (BioNet, 2025). While the location of the development footprint and wider subject land is not listed on the 'important population' list in the species' Approved Conservation Advice (DAWE, 2021) further research may determine additional important populations.

Many of the known subpopulations are often confined to small grassland remnants of <5 ha. The species is often restricted to discrete areas within grassy sites and breeding areas. In these areas, females are likely to be highly specialised and dependent on the presence of food plants and varied bare ground cover (DAWE, 2021).

There have been no observations of any *S. plana* individuals, populations or important populations within the entirety of the subject land, or within 10 km of the subject land (BioNet, 2025). No targeted surveys have been undertaken for this species; however, the area of impact is adjacent to a current access track, in which the vegetation is highly disturbed through past track construction, vehicular movements, edge effects and regular agricultural activities such as grazing and machinery movement. There are few larval food plants such as Spear Grass (*Austrostipa* spp.) or Wallaby Grass (*Rytidosperma* spp.) species present within the subject land. This combination of land use activity, low vegetation condition and threat presence result in low likelihood of this habitat appropriately supporting an *S. plana* population.

Given the above factors, **it is unlikely that the proposed action would lead to a long-term decrease in the size of an important *S. plana* population.**

b) Reduce the area of occupancy of an important population

S. plana was historically widespread across south-eastern Australia and was relatively continuous throughout its range. The species extended from central NSW, through the NSW Southern Tablelands, down to central and western VIC and into eastern SA. Species distribution shows a close correlation to temperate grassland dominated by *Rytidosperma* spp. (DAWE, 2021).

Survey effort in recent years has shown that the species is known from approximately 104 sites in Victoria and 78 sites in the ACT. Survey effort in NSW is considered to be insufficient, with the majority of habitat occurring on private land. However, extant site localities have been discovered in NSW, to the north of the ACT (DAWE, 2021). This species inhabits native grasslands, open grassy woodlands and secondary grasslands, that retain a component of larval food species. This includes degraded habitats that retain a component of native larval food species, or that have been invaded by Chilean Needlegrass (*Nassella*

neesiana). Sites where *S. plana* is found are generally flat or gently sloping, with full sun exposure. Shading, including in the form of trees or buildings, can negatively affect ideal characteristics of a potential site (DAWE, 2021). A total of 1.67 ha of low condition grassland as potential habitat for *S. plana* is proposed to be removed as part of the action. In addition, *S. plana* is associated with PCT 277 which occurs throughout the development footprint. Although 1.85 ha of PCT 277 within the development footprint is proposed to be removed, 1.52 ha is made up of low condition grassland and 0.33 ha is woodland, unsuitable for *S. plana*. The low condition grassland could potentially be suitable habitat for this species, however due to the general degradation of the vegetation and past disturbance of land within the project site, it is unlikely that the potential habitat would appropriately support its occupancy. The lack of larval food plants also suggests that *S. plana* is unlikely to occupy the general project area.

In addition, no individuals, populations or important populations of this species have been observed in the development footprint or within 10 km of the subject land (BioNet, 2025). **Considering the above factors, the proposed project is not likely to significantly reduce the area of occupancy of an important population of this species.**

c) Fragment an existing important population into two or more populations

The development footprint primarily includes an existing access track, in which the action proposes to widen the track to access the BESS site. Given the degraded condition of vegetation along the existing track edge, low condition of vegetation across the site as a result of land use and current grazing pressure, and lack of larval food plants, it is unlikely that suitable habitat would appropriately support a population of this species. **Therefore, the project is unlikely to cause fragmentation of an existing important population into two or more populations of this species.**

d) Adversely affect habitat critical to the survival of a species

Habitat critical to the survival of this species has yet to be identified, but likely includes all native grassland and open grassy woodland habitat occupied by the species across its range. Since the species has specialised habitat requirements, all occupied habitat is important for breeding activity of the associated subpopulation and recovery of the species. Large subpopulations or smaller well-connected subpopulations occurring in high quality habitat would classify as habitat critical to the species' survival. High quality habitat is defined at medium to large sites containing native grassland with an abundant component of larval food species (*Rytidosperma* spp. and / or *Austrostipa* spp.), low weed cover, inter-tussock spaces and land use resulting in high ecological site value (DAWE, 2021). With these factors in consideration, no habitat critical to the survival of the species occurs within the project area.

There is no critical habitat defined on the Register of Critical Habitat (DCCEEW, 2025). There is no existing recovery plan for this species (DCCEEW, 2025). This development footprint and wider subject land is not considered critical habitat for this species.

While 1.67 ha of grassland habitat for *S. plana* is proposed to be removed, it is not its preferred habitat. This is due to low quality vegetation, degradation as a result of agricultural related activities, consistent grazing and trampling, and lack of larval food plants to support the species. In the subject land, 4.55 ha of grassland would be retained. Within a 1500 m radius of the subject land, approximately 19.17 ha of its associated PCT 277 would be retained and has the potential to provide suitable habitat for *S. plana*.

In consideration of the above factors, **it is unlikely that the project would adversely affect habitat critical to the survival of this species.**

e) Disrupt the breeding cycle of an important population

Adult moths emerge from the ground during breeding season (also known as flying season), which falls between mid-October and early January. Breeding season typically lasts from six to eight weeks, with varied timing between localities across its range. After emergence, male moths spend their few short days

patrolling habitat for females by flying over grassland in short bursts, in warm weather. Females are semi-flightless, displaying themselves from sedentary positions. After mating, females lay eggs (approximately 74 eggs each) within the base of grass tussocks of *Rytidosperma* spp., *Austrostipa* spp. and Chilean Needlegrass. At the end of the larval period, they tunnel to the surface and pupation occurs underground in spring. Once adult features have developed within the case, the pupa rises to the surface and the adult emerges (DAWE, 2021).

While the development site is not mentioned on the 'important population' list in the Conservation Advice, more research may determine more areas (DAWE, 2021). There are no records of any important *S. plana* populations within the development footprint, subject land, or within 10 km of the subject land (BioNet, 2025).

There are no known or existing populations or important populations of this species within the subject land. Due to the degraded condition of vegetation, lack of larval food plants and current heavy grazing pressure, it is unlikely that suitable habitat would appropriately support a population of this species. **The project is unlikely to disrupt the breeding cycle of an important population of *Synemon plana*.**

f) Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

As part of the proposal, 1.67 ha of low condition grassland as potential habitat would be removed, adjacent to existing and frequently utilised access tracks. 4.55 ha of grassland is being retained within the subject land, therefore removing 26.85% of grassland from the subject land.

With consideration that *S. plana* is associated with PCT 277, 5.08 ha of this PCT being retained within the subject land, and approximately 19.17 ha being retained within 1500 m of the subject land (assessment area). Therefore approximately 91.2% of potential habitat for *S. plana* is being retained within the overall assessment area.

The main identified threats to this species are related to land clearing for agriculture and urban development, soil disturbance, lack of biomass removal, intensification of grazing and/or mowing, application of chemicals (such as herbicides, pesticides and fertilisers), planting and/or regeneration of shrubs and trees, weed invasion, habitat degradation by the introduced Rabbit (*Oryctolagus cuniculus*), increasing predation by birds, inappropriate fire regimes and climate change. The development footprint is currently being used for agriculture, with high disturbance, grazing, trampling and multiple other threatening processes to *S. plana*. Considering these factors, the potential habitat overall is not likely to support *S. plana*. Given that the project proposes removal of 1.67 ha of potentially suitable habitat that has been significantly modified and disturbed by land use, in combination with lack of records in the assessment area, **the species is not likely to decline as a result of modifying, destroying, removing or decreasing the availability of habitat.**

g) Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat

Weed invasion is a listed threat to *S. plana*. The proposal has the potential to contribute to the spread of invasive species, mainly through the clearing of vegetation and transfer and introduction of plant material and soil on machinery. Spear Thistle and other weeds are currently present throughout the site. Mitigation measures have been recommended to prevent the spread of weeds on site through implementation of biosecurity practices. With these in place, the proposal would therefore be unlikely to result in invasive species that are harmful to these species becoming established in potential *S. plana* habitat.

Due to the project site and surrounds being heavily cleared and utilised for agriculture, it is highly likely that the introduced Rabbit occupies the area. The proposed project is not likely to increase the numbers of this pest.

The proposed action would therefore be unlikely to result in invasive species that are harmful to this species becoming established in its potential habitat.

h) Introduce disease that may cause the species to decline, or

S. plana is not known to be susceptible to diseases that may cause it to decline (DAWE, 2021). **The proposed project is considered unlikely to result in the introduction of disease that may cause the species to decline.**

i) Interfere substantially with the recovery of the species.

The proposed project would remove 1.67 ha of grassland as potential habitat for this species, while 4.55 ha of grassland and 19.17 ha of its associated PCT 277 is being retained within the 1500 m buffer. Despite this, the development footprint and surrounds is highly modified from intensive grazing, cropping and other agricultural activities. There is no adopted or made Recovery Plan for this species (DCCEEW, 2025). Although no Recovery Plan exists for this species, the Saving our Species (SoS) program identifies priority actions for *Synemon plana* and priority management sites, none of which occur within the project area (NSW DPE, 2025). Considering these factors and the absence of observations within the development footprint and assessment area (BioNet, 2025), **the proposed project is unlikely to substantially interfere with the recovery of this species.**

j) Conclusion.

The proposed action is not likely to lead to a long-term decrease in the size of an important *S. plana* population, reduce the area of occupancy an important population or fragment an existing important population into two or more populations. It is not likely to adversely affect habitat critical to the survival of the species, disrupt the breeding cycle of an important population or substantially interfere with the recovery of the species. Due to the degraded condition of the landscape and that multiple key threats already impact the development footprint, the proposed action is not likely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline. With standard biosecurity protocols in place, the proposed action is not likely to introduce disease that may cause the species to decline. Recommended mitigation measures to prevent the introduction of new weeds and spread of existing weeds include:

- Vehicles and machinery to be checked for soil and plant matter and washed-down prior to entering the site
- Brushing and cleaning boots if walking through native vegetation

Considering the above factors, **the proposed action is not likely to have a significant impact on *Synemon plana*.**

Striped Legless Lizard (*Delma impar*)

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

a) Lead to a long-term decrease in the size of an important population of a species

The MNES Significant impact guidelines 1.1 states that an 'important population' is 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.

Conservation Advice (2016) for *Delma impar* states:

The understanding of fine scale population structure is limited and difficult to assess given the fragmented and disturbed nature of the species habitat and the difficulty in detecting the species due to its cryptic nature. For these reasons it is considered that when one or more individuals are found on a site that they are a member/s of an important population.

The presence of *D. impar* in the subject land has been assumed based on associated PCTs and the presence of potential habitat. No known populations occur within the Subject Land.

Striped Legless Lizard are known to occur in the *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* ecological community. This species is a grassland specialist "found only in areas of native grassland and nearby grassy woodland and exotic pasture" (Threatened Species Scientific Committee, 2016). The subject land contains moderate-high condition woodland with native dominated understorey, and moderate condition woodland with exotic understorey due to past and present land use and related agricultural activities. *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* is a Critically Endangered Ecological Community (CEEC) and was confirmed within the subject land, with 0.22 ha proposed to be removed as part of the project.

Distribution mapping shows the development footprint occurs within the subregion where this species is known to occur or its habitat is likely to occur (DCCEEW, 2025). There are no BioNet records within the subject land, or within 10 km of the subject land for this species (BioNet, 2025). While the location of the development footprint and wider subject land is not listed on the 'important population' list in the species' Approved Conservation Advice (Threatened Species Scientific Committee, 2016) further research may determine additional important populations. Its Conservation Advice (2016) states that all populations of *D. impar* are likely to be important for the species recovery (Threatened Species Scientific Committee, 2016).

No targeted surveys have been undertaken for this species; however the area of impact is adjacent to a current access track, which has previously been disturbed through track construction, edge effects and regular agricultural activities such as grazing and machinery movement. This combination of land use activity and threats result in low likelihood of this habitat supporting a *D. impar* population.

Given the above factors, **it is unlikely that the proposed action would lead to a long-term decrease in the size of an important *D. impar* population.**

b) Reduce the area of occupancy of an important population

D. impar is a grassland specialist, only found in areas of native grassland and nearby grassy woodland and exotic pasture (DCCEEW, 2025). Its primary habitat is encompassed by four nationally threatened ecological communities, including:

- *Natural Temperate Grassland of the Victorian Volcanic Plain*
- *Grassy Eucalypt Woodland of the Victorian Volcanic Plain*
- *Natural Temperate Grassland of the South Eastern Highland, and*
- *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland*

(Threatened Species Scientific Committee, 2016).

As part of the proposal, the area of impact of potential habitat for this species is 2.00 ha, including 1.85 ha of its associated PCT 277. The majority of potential habitat is low condition grassland (1.67 ha), adjacent to existing and frequently utilised access tracks. This species is also associated with the *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* CEEC, of which 0.22 ha occurs within the development footprint. State Vegetation Type Mapping (NSW DCCEEW, 2020) shows that there is 173.52 ha of native vegetation within a 1500 m radius of the subject land (assessment area), therefore only 1.15% of native vegetation within the assessment area is proposed to be removed.

The total area of occupancy of *D. impar* is unknown (DCCEEW, 2025), however it is known to occur in isolated populations throughout the Australian Capital Territory (ACT), north-eastern, central and south-western Victoria (VIC), south-eastern South Australia (SA), and south-eastern New South Wales (NSW) (Threatened Species Scientific Committee, 2016).

Due to the degraded condition of the CEEC, and low condition grassland throughout the subject land, it is unlikely that suitable habitat would appropriately support the occupancy of this species. This also considers current land use which includes pastoral development and stock, resulting in grazing pressure and presence of exotic grasses and weeds. This species is susceptible to urban development, high intensity grazing, ploughing and pasture improvement, herbicide use, spread of exotic grasses, predation by pests and inappropriate fire regimes (Threatened Species Scientific Committee, 2016). No individuals, populations or important populations of this species have been observed in the development footprint or within 10 km of the subject land (BioNet, 2025). Habitat within the project site is unlikely to support a population due to current land use. **Considering these factors, the proposed project is not likely to significantly reduce the area of occupancy of an important population of this species.**

c) Fragment an existing important population into two or more populations

The development footprint primarily includes an existing access track, in which the action proposes to widen the track to access the BESS site. *D. impar* is a mobile species and would be unlikely to be affected from widening an existing access track by 15 metres. Given the degraded condition of vegetation along the existing track edge, low condition of vegetation across the site as a result of land use and current grazing pressure, it is unlikely that suitable habitat would appropriately support a population of this species. **Therefore, the project is unlikely to cause fragmentation of an existing important population into two or more populations of this species.**

d) Adversely affect habitat critical to the survival of a species

Approved Conservation Advice for *D. impar* states that habitat critical to the survival of the species must possess more than one of a range of characteristics (Threatened Species Scientific Committee, 2016). Based on its Approved Conservation Advice and assessment of this species as part of this AoS, the development footprint and wider subject land does not provide critical habitat required for the survival of the species. This assessment was based on the analysis that the development footprint and subject land:

- Does not provide foraging habitat due to lack of tussock grasses and low diversity of groundcover species
- Does not provide refuge (including surface rocks) from disturbance events,
- Does not provide long term protection from development due to current agricultural land use and lack of burrows,
- Does not contain connectivity value or contribute to the evolutionary potential of the species in the wild across its natural geographical range.

(Threatened Species Scientific Committee, 2016)

There is no habitat critical to the survival for *D. impar* on the Register of Critical Habitat (DCCEEW, 2014). There is no existing recovery plan for this species (DCCEEW, 2025).

In consideration of the above factors, it is unlikely that the Subject Land would appropriately support the occupancy of this species. **Therefore, the project would not adversely affect habitat critical to the survival of this species.**

e) Disrupt the breeding cycle of an important population

In *D. impar* females, two eggs are typically laid in December and January, hatching in January and February. November and December are thought to be when mating and other activities in preparation for egg-laying occur (DCCEEW, 2025). While the development site is not mentioned on the 'important population' list in the Conservation Advice, more research may determine more areas. The Conservation Advice (2016) states 'All populations of *D. impar* are likely to be important for the species recovery' (Threatened Species Scientific Committee, 2016).

There are no known or existing populations or important populations of this species within the subject land. Due to the degraded condition of vegetation and current heavy grazing pressure, it is unlikely that suitable habitat would appropriately support a population of this species. **The project is unlikely to disrupt the breeding cycle of an important population of *Delma impar*.**

f) Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

As part of the proposal, the area of impact of potential habitat for this species is 2.00 ha, including 1.85 of its associated PCT 277. The majority of this area is low condition grassland (1.67 ha), adjacent to existing and frequently utilised access tracks. This species is also associated with the *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* CEEC, of which 0.22 ha has been confirmed within the development footprint. 7.14 ha of this CEEC is being retained with the locality. As part of the project, 5.08 ha of PCT 277 is being retained within the subject land and 6.37 ha of total potential habitat retained.

The main identified threats to this species are related to agricultural development and related activities. This includes urban development, high intensity grazing, ploughing and pasture improvement, herbicide use, spread of exotic grasses, predation by pests and inappropriate fire regimes. The subject land is currently being used for agriculture, resulting in trampling, grazing, herbicide use and the presence of pests including the European Red Fox (*Vulpes vulpes*) (Threatened Species Scientific Committee, 2016). Considering these factors, the potential habitat overall is not likely to support the occupancy of *D. impar*. Given that the project proposes removal of 1.85 ha of potentially suitable habitat that has been significantly modified and disturbed by land use, in combination with lack of records in the assessment area, **the species is not likely to decline as a result of modifying, destroying, removing or decreasing the availability of habitat.**

g) Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat

The proposal has the potential to contribute to the spread of invasive species, mainly through the clearing of vegetation and transfer and introduction of plant material and soil on machinery. Spear Thistle and other weeds are currently present throughout the site. Mitigation measures have been recommended to prevent the spread of further weeds on site through implementation of biosecurity practices. With these in place, the proposal would therefore be unlikely to result in invasive species that are harmful to these species becoming established in potential *D. impar* habitat.

Feral cats and the European Red Fox are threats to *D. impar*. The European Red Fox has been incidentally observed on site, therefore at least one of these predators is already established in potential habitat for *D. impar*. The proposed project is not likely to increase the numbers of these predators.

The proposed action would therefore be unlikely to result in invasive species that are harmful to this species becoming established in its potential habitat.

h) Introduce disease that may cause the species to decline, or

D. impar is not known to be susceptible to diseases that may cause it to decline (Threatened Species Scientific Committee, 2016). **The proposal is considered unlikely to result in the introduction of disease that may cause the species to decline.**

i) Interfere substantially with the recovery of the species.

The following conservation and management priorities for *D. impar* are listed in its Approved Conservation Advice:

Habitat loss, disturbance and modifications

Protect and prevent impacts to habitat critical to the survival of the species in the planning, construction and post construction phases of developments.

Negotiate and implement conservation agreements or reserves for striped legless lizard on privately owned land which do not allow high intensity grazing, cropping and pasture improvement activities and involve ongoing management.

Improve the quality and condition of reserves which have been set aside for the species.

If after an extensive and rigorous scientific assessment of translocation is found to be feasible and beneficial to the species and if suitable recipient sites can be identified, implement the translocation of animals to appropriate recipient locations.

Invasive species

- *Control feral cats and foxes in areas where striped legless lizards occur within or adjacent to urban areas or other areas harbouring these species (i.e. waste facility depots, golf courses etc).*
- *Identify, control and reduce the spread of invasive grasses including escaped pasture species.*

Fire

- *Work with fire authorities and private landholders to plan and undertake any burns proposed in areas of habitat critical to the survival of the species in a way that will maintain or improve the habitat for the species.*

Stakeholder engagement

- *Support and improve collaboration amongst stakeholders who are managing grassland reserves or are involved in surveying or monitoring populations on private land. Stakeholders include but are not limited to: private landholders, state and local governments, the Department of Defence,*

Friends of Grasslands, Cairnlea Conservation Reserves Committee of Management, Nature Glenelg Trust, Bush Heritage Australia and Zoos South Australia.

- *Engage with local Indigenous communities to better understand pre European temperate grassland management practices relating to fire. This includes but is not limited to the Wurundjeri people of Victoria, Ngunnawal and Ngambri people of the ACT and NSW.*
- *Educate public in areas adjacent to striped legless lizard habitat about the predation risk posed by domestic cats, and the principles of responsible cat ownership.*

(Threatened Species Scientific Committee, 2016)

The proposed project would remove 2.00 ha of potential habitat (including 1.85 ha of its associated PCT 277) for this species, of which 0.22 ha is classified as *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland*. However, 7.14 ha of this CEEC would be retained. This ecological community is one of the four ecological communities where this species is known to inhabit; however, the development footprint and surrounds is highly modified from intensive grazing, cropping and other agricultural activities. There is no adopted or made Recovery Plan for this species (DCCEEW, 2025). Although no Recovery Plan exists for this species, the Saving our Species (SoS) program identifies two priority actions for *Delma impar* (NSW DPE, 2025). Considering these factors and the absence of observations within the development footprint and assessment area (BioNet, 2025), **the proposed project is unlikely to substantially interfere with the recovery of this species.**

j) Conclusion.

The proposed action is not likely to lead to a long-term decrease in the size of an important *D. impar* population, reduce the area of occupancy an important population or fragment an existing important population into two or more populations. It is not likely to adversely affect habitat critical to the survival of the species, disrupt the breeding cycle of an important population or substantially interfere with the recovery of the species. Due to the degraded condition of the landscape and that multiple key threats already impact the development footprint, the proposed action is not likely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline. With standard biosecurity protocols in place, the proposed action is not likely to introduce disease that may cause the species to decline. The European Red Fox has previously been observed within the subject land, with a high likelihood of feral cat presence. The proposed project is not likely to increase the presence of these pests. Recommended mitigation measures include:

- Vehicles and machinery to be checked for soil and plant matter and washed-down prior to entering the site
- Brushing and cleaning boots if walking through native vegetation.

Considering the above factors, **the proposed action is not likely to have a significant impact on *Delma impar*.**

1.3 Migratory species

The *Environment Protection and Biodiversity Conservation Act 1999* specifies factors to be considered in deciding whether a development is likely to significantly affect Endangered Ecological Communities, threatened species and migratory species, listed at the Commonwealth level. These assessments characterise the significance of likely impacts associated with the development on the following Migratory species:

Birds

- Fork-tailed Swift (*Apus pacificus*)
- White-throated Needletail (*Hirundapus caudacutus*)
- Yellow Wagtail (*Motacilla flava*)

Fork-tailed Swift (*Apus pacificus*)

An action is likely to have a significant impact on a migratory species if there is a real chance of possibility that it will:

- Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species**

The MNES Significant impact guidelines 1.1 states that an area of ‘important habitat’ for a migratory species is:

- *habitat utilised by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species, and/or*
- *habitat that is of critical importance to the species at particular life-cycle stages, and/or*
- *habitat utilised by a migratory species which is at the limit of the species range, and/or*
- *habitat within an area where the species is declining.*

Apus pacificus is a non-breeding visitor to Australia. They are almost exclusively aerial, flying from less than 1 m to at least 300 m above ground, and likely much higher. In NSW, *A. pacificus* has been recorded in all regions (DCCEEW, 2025). There are no observed records within 10km of the subject land (BioNet, 2025).

In Australia, they mostly occur over inland plains but sometimes above foothills or in coastal areas, often over cliffs, beaches, islands and sometimes well out to sea. *A. pacificus* also occurs over settled areas, including towns, urban areas and cities, but mostly occur over dry or open habitats. They are also found at treeless grassland and sandplains covered with spinifex, open farmland and inland and coastal sand-dunes (DCCEEW, 2025).

Important habitat for *A. pacificus* is defined as “Non-breeding habitat Found across a range of habitats, from inland open plains to wooded areas, where it is exclusively aerial” (DOE, 2015) . The modelled distribution for its core range is across the whole of the Australian continent.

The presence of *A. pacificus* in the subject land has been assumed based on the presence of potential habitat. Of the total 2.00 ha of potential habitat proposed to be removed, 0.33 ha is woodland, and 1.67 ha is grassland. In addition, potential retained habitat within the subject land consists of 4.55 ha of grassland and 1.82 ha of woodland. Grassland in the subject land is in low condition, with woodland areas of moderate condition containing an exotic dominated understorey, and moderate-high condition with a native dominated understorey. The proposed action would remove HBTs from a highly disturbed area, with

at least 20 HBTs retained within the subject land. It would also retain 30 ha of woodland within the locality and 171.52 ha of native vegetation.

Based on the broad definition and location of important habitat for *A. pacificus*, important habitat does occur with the subject land. This species is highly mobile and has a wide distribution, and it would not be likely to be impacted through the installation of a BESS. It is unlikely that increasing the existing access track from eight metres to 23 m at the widest points would impact movement of *A. pacificus*.

Therefore, the proposed action would impact on 2.00ha of important habitat for *A. pacificus* however in the context of its core range, the impacts are minor in the context of the locality and unlikely to substantially modify, destroy or isolate an area of important habitat.

b) Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species, or

Potential threats to *A. pacificus* includes predation by feral animals (DCCEEW, 2025). The proposed action is not likely to increase the presence of pest fauna species or exacerbate the number of pests that are already present on site.

The proposed action also has the potential to contribute to the spread of invasive weed species in the subject land through the transfer and introduction of plant material and soil on machinery. The implementation of appropriate biosecurity practices will assist to prevent and control these impacts.

Therefore, the proposed action is not likely to result in invasive species that are harmful to *A. pacificus* becoming established in an area of important habitat for the migratory species.

c) Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.

A. pacificus is an aerial eater, flying above the ground to forage for insects. They feed in flocks ranging from 10 – 1000 individuals. *A. pacificus* does not breed in Australia, therefore the proposal will not impact its breeding cycle. An ecologically significant proportion of a population of *A. pacificus* is considered to be 100 individuals at the national level, and 1,000 at the international level (DOE, 2015). Since no individuals have been observed within the subject land or locality, there is not considered to be an ecologically significant proportion of an *A. pacificus* population and the project would not impact any.

This migratory species is highly mobile and has a wide distribution, and would not likely be impacted through the installation of a BESS. It is unlikely that increasing the existing access track from eight metres to 23 m at the widest points would impact *A. pacificus*. There are also no observed records of the species within 10 km of the subject land (BioNet, 2025). Of the total 2.00 ha of potential habitat proposed to be removed, 0.33 ha is woodland, and 1.67 ha is grassland. In addition, potential retained habitat within the subject land consists of 4.55 ha of grassland and 1.82 ha of woodland. Grassland in the subject land is in low condition, with woodland areas of moderate condition containing an exotic dominated understorey, and moderate-high condition with a native dominated understorey. The proposed action would remove HBTs from a highly disturbed area, with at least 20 HBTs retained within the subject land. It would also retain 30 ha of woodland within the locality and 171.52 ha of native vegetation.

Considering these factors, it is unlikely the proposed action would seriously disrupt the lifecycle of an ecologically significant proportion of the population of *A. pacificus*.

d) Conclusion.

The proposed action is not likely to substantially modify, destroy or isolate an area of important habitat for a migratory species, or result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species. It is not likely to seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.

Therefore, the proposed action is not likely to have a significant impact on *A. pacificus*.

White-throated Needletail (*Hirundapus caudacutus*)

An action is likely to have a significant impact on a migratory species if there is a real chance of possibility that it will:

- a) Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species**

The MNES Significant impact guidelines 1.1 states that an area of 'important habitat' for a migratory species is:

- *habitat utilised by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species, and/or*
- *habitat that is of critical importance to the species at particular life-cycle stages, and/or*
- *habitat utilised by a migratory species which is at the limit of the species range, and/or*
- *habitat within an area where the species is declining.*

Hirundapus caudacutus is mostly aerial in Australia, occurring from heights of less than one metre to over 1,000 m above ground level. They occur throughout most habitat types, but are most often observed above wooded areas, including open forest and rainforest, but may also fly below canopies. When flying above farmland, they are often recorded above partly cleared pastures, remnant vegetation, plantations or paddock edges (Threatened Species Scientific Committee, 2019).

Important habitat for this species is defined as non-breeding habitat only, in wooded areas (Threatened Species Scientific Committee, 2019). Therefore, habitat within the Subject Land is considered important for the species. However, the 1.67 ha of grassland to be removed is in low condition, and 0.33 ha of woodland is in moderate to high conditions.

There are no observed records of *H. caudacutus* utilising the subject land or locality (BioNet, 2025). It's core distribution occurs across Eastern Australia from Tasmania to Queensland (DOE, 2015). The presence of *H. caudacutus* in the subject land has been assumed based on the presence of potential habitat and its core distribution range. Of the total 2.00 ha of potential habitat proposed to be removed, 0.33 ha is woodland, and 1.67 ha is low condition grassland. In addition, potential retained habitat within the subject land consists of 4.55 ha of grassland and 1.82 ha of woodland.

Grassland in the subject land is in low condition, with woodland areas of moderate condition containing an exotic dominated understorey, and moderate-high condition with a native dominated understorey. The proposed action would remove five HBTs from a highly disturbed area, with at least 20 HBTs retained within the subject land. It would also retain 30 ha of woodland within the locality and 171.52 ha of native vegetation. Considering that this species is highly mobile and has a wide distribution range, the removal of 2.00ha of potential habitat is minor in the context of the locality **and unlikely to substantially modify, destroy or isolate an area of important habitat.**

- b) Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species, or**

Invasive species that are harmful to *H. caudacutus* becoming established in its habitat include the Common Starling (*Sturnus vulgaris*) and Noisy Miner (*Manorina melanocephala*) which compete for roosting habitat, and reduce the ability of *H. caudacutus* to become established within the potential suitable habitat (Threatened Species Scientific Committee, 2019). These invasive species occupy fragmented landscapes. The subject land is already fragmented from current access tracks and agricultural activities and the proposal is unlikely to exacerbate presence of feral bird species.

In addition, the proposed action is not likely to increase the presence of pest fauna species such as feral cats or foxes or exacerbate the number of pests that are already present on site.

The proposed action has the potential to contribute to the spread of invasive weed species in the subject land through the transfer and introduction of plant material and soil on machinery. The implementation of appropriate biosecurity practices outlined in the BDAR will assist to prevent and control these impacts.

Therefore, the proposed action is not likely to result in invasive species that are harmful to *H. caudacutus* becoming established in an area of important habitat for the migratory species.

c) Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.

H. caudacutus does not breed within Australia, migrating to and breeding within Asia (Threatened Species Scientific Committee, 2019). This migratory species is highly mobile with a wide distribution range, and would not likely be impacted through the installation of a BESS. Therefore, it is unlikely that increasing the existing access track from eight metres to 23 m at the widest points would impact *H. caudacutus*. There are also no observed records of the species within 10 km of the subject land (BioNet, 2025). Of the total 2.00 ha of potential habitat proposed to be removed, 0.33 ha is woodland, and 1.67 ha is grassland. In addition, potential retained habitat within the subject land consists of 4.55 ha of grassland and 1.82 ha of woodland. Grassland in the subject land is in low condition, with woodland areas of moderate condition containing an exotic dominated understorey, and moderate-high condition with a native dominated understorey. The proposed action would remove HBTs from a highly disturbed area, with at least 20 HBTs retained within the subject land. It would also retain 30 ha of woodland within the locality and 171.52 ha of native vegetation.

An ecologically significant proportion of *H. caudacutus* is defined as 100 (internationally) and 10 (nationally) (DOE, 2015). Based on a lack of observed records within 10 km of the subject land, it is unlikely there would be an ecologically significant proportion of an *A. pacificus* population in the Subject Land. In addition, due to the minimal vegetation to be cleared, no impacts to the population are considered to occur.

Considering these factors, it is unlikely the proposed action would seriously disrupt the lifecycle of an ecologically significant proportion of the population of *H. caudacutus*.

d) Conclusion.

The proposed action is not likely to substantially modify, destroy or isolate an area of important habitat for a migratory species, or result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species. It is not likely to seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.

Therefore, the proposed action is not likely to have a significant impact on *H. caudacutus*.

Yellow Wagtail (*Motacilla flava*)

An action is likely to have a significant impact on a migratory species if there is a real chance of possibility that it will:

- a) Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species**

The MNES Significant impact guidelines 1.1 states that an area of ‘important habitat’ for a migratory species is:

- *habitat utilised by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species, and/or*
- *habitat that is of critical importance to the species at particular life-cycle stages, and/or*
- *habitat utilised by a migratory species which is at the limit of the species range, and/or*
- *habitat within an area where the species is declining.*

In Australia, *Motacilla flava* has a widespread distribution, with likely or potential habitat occurring throughout most of the country (DCCEEW, 2025). It favours damp or wet habitats with low vegetation, such as marshes, damp meadows, bogs and waterside pastures. It is also found in sewage farms, grassy tundra and damp steppe, and found in large forest clearings in the north of its range. It is a wholly migratory species, with an occurrence extent of 40,900,000 km² (BirdLife, 2025).

Important habitat for this species is defined as “Non-breeding habitat of mostly well-watered open grasslands and the fringes of wetlands. Roosts in mangroves and other dense vegetation” (DOE, 2015). None of these habitats occur within the Subject Land and important habitat is not considered to occur.

The presence of *M. flava* in the subject land has been assumed based on the presence of potential habitat. Of the total 2.00 ha of potential habitat proposed to be removed, 0.33 ha is woodland, and 1.67 ha is grassland. In addition, potential retained habitat within the subject land consists of 4.55 ha of grassland and 1.82 ha of woodland. Grassland in the subject land is in low condition, with woodland areas of moderate condition containing an exotic dominated understorey, and moderate-high condition with a native dominated understorey. The proposed action would remove HBTs from a highly disturbed area, with at least 20 HBTs retained within the subject land. It would also retain 30 ha of woodland within the locality and 171.52 ha of native vegetation.

M. flava is not known to utilise the subject land or locality. This species is highly mobile and has a wide distribution, and would not likely be impacted through the installation of a BESS. It is unlikely that increasing the existing access track from eight metres to 23 m at the widest points would impact movement of *M. flava*.

Incorporating these factors, and lack of observed records within 10 km of the subject land, important habitat is considered absent. Therefore, the proposed action would not substantially modify, destroy or isolate an area of important for *M. flava*.

- b) Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species, or**

Important habitat is not considered to be present within the subject land.

The proposed action has the potential to contribute to the spread of invasive weed species in the subject land through the transfer and introduction of plant material and soil on machinery. The implementation of appropriate biosecurity practices will assist to prevent and control these impacts. In addition, the proposed action is not likely to increase the presence of pest fauna species or exacerbate the number of pests that are already present on site.

Therefore, the proposed action is not likely to result in invasive species that are harmful to *M. flava* becoming established in an area of important habitat for the migratory species.

c) Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.

M. flava breeds from April to August, but varies with latitude (BirdLife, 2025). This migratory species is highly mobile and has a wide distribution, and would not be likely to be impacted through the installation of a BESS. It is unlikely that increasing the existing access track from eight metres to 23 m at the widest points would impact movement of *A. pacificus*. There are also no observed records of the species within 10 km of the subject land (BioNet, 2025). Of the total 2.00 ha of potential habitat proposed to be removed, 0.33 ha is woodland, and 1.67 ha is grassland. In addition, potential retained habitat within the subject land consists of 4.55 ha of grassland and 1.82 ha of woodland. Grassland in the subject land is in low condition, with woodland areas of moderate condition containing an exotic dominated understorey, and moderate-high condition with a native dominated understorey. The proposed action would remove HBTs from a highly disturbed area, with at least 20 HBTs retained within the subject land. It would also retain 30 ha of woodland within the locality and 171.52 ha of native vegetation.

An ecologically significant proportion of *M. flava* is defined as 10000 (internationally) and 1000 (nationally) (DOE, 2015). Known records occur on the coastal areas of NSW (DOE, 2015). Based on a lack of observed records within 10 km of the subject land, and lack of important habitat it is unlikely the species would occur in numbers over 1000 across the Subject Land.

Considering these factors, it is unlikely the proposed action would seriously disrupt the lifecycle of an ecologically significant proportion of the population of *M. flava*.

d) Conclusion.

The proposed action is not likely to substantially modify, destroy or isolate an area of important habitat for a migratory species, or result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species. It is not likely to seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.

Therefore, the proposed action is not likely to have a significant impact on *M. flava*.

1.4 Critically Endangered and Endangered Ecological Communities

The *Environment Protection and Biodiversity Conservation Act 1999* specifies factors to be considered in deciding whether a development is likely to significantly affect Endangered Ecological Communities, threatened species and migratory species, listed at the Commonwealth level. These assessments characterise the significance of likely impacts associated with the proposal on the following Critically Endangered and Endangered Ecological Communities:

Critically Endangered

- 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
An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:
a) Reduce the extent of an ecological community
The proposed development footprint is located in the NSW South Western Slopes Bioregion and features PCT 277 Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion. Some areas of this PCT on site matches the description for <i>White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland</i>, a Critically Endangered Ecological Community (CEEC) under the <i>Environment Protection and Biodiversity Conservation Act 1999</i>. These areas occur on the western portion of the site, adjacent to the existing access track. This CEEC patch meets the Commonwealth listed TEC criteria, based on a predominantly native understory, a patch size of more than 2 ha, at least 20 mature trees per hectare and natural regeneration of <i>Eucalyptus blakelyi</i>. A desktop review of State Vegetation Type Mapping (SVTM) shows that PCT 277 is mapped within the assessment area (NSW DCCEEW, 2020). In addition, confirmation of presence for this PCT and CEEC was made by a BAM-accredited senior ecologist during a site investigation. This CEEC was mapped within the subject land using site observations and LiDAR imagery. The overall patch of <i>White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland</i> within the proposed development footprint is 0.22 ha and comprises only one canopy tree (Blakely's Red Gum). This is located between two existing access tracks, therefore has been previously fragmented of this clearing. Within the subject land, there is 0.57 ha of this CEEC, which has the potential to be indirectly impacted through construction-related activities including potential weed spread through trampling and vehicular movements. This patch extends outside the subject land, totalling approximately 7.36 ha patch of woodland within the locality. The proposed project would reduce the extent of this CEEC by 0.22 ha from the local patch of 7.36 ha through vegetation removal inside the development footprint. Therefore, there would be a loss of approximately 3% of <i>White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland</i> within the subject land. Towards the west where the CEEC occurs, SVTM shows that there is approximately 7.14 ha of PCT 277 being retained. Therefore, the local patch is approximately 7.36 ha in size and the proposed project would reduce the extent of the local patch by approximately 3%. Due to the small clearing area, low condition vegetation and current land use, it is not likely that the proposed action would significantly reduce the extent of this CEEC.
b) fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines

The disturbance of *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* would be unavoidable due to vegetation clearing widening the existing access track in the western section of the development footprint. This area is 0.22 ha in size and currently exists in the in a small fragmented patch between two access tracks, on the edge of a larger patch of *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland*.

According to Conservation Advice, land clearance of this CEEC should be avoided, as it is a Key Threatening Process (DCCEEW, 2023). At each widest point, the area to be cleared is 170 m in length and 20 m wide. This section is directly adjacent to an existing access track on the northern side, and adjacent to existing access tracks on the southern side. The proposed action would increase fragmentation of the woodland, which could impact on fauna species that rely on woodland for movement. The proposed impacts would create an increase of track widths from eight metres up to 23 m in width causing additional minor fragmentation but still allow for movement of fauna species reliant on this CEEC. Since the project proposes to clear vegetation on the edge of an existing patch which has been degraded through grazing, land use and general farming activities, it is not likely that the action would cause significant fragmentation. This patch has previously been fragmented on both the north and south sides as a result of clearing for the existing access track. Therefore, it is not considered likely that this action would have a significant impact on increasing fragmentation of this ecological community.

c) adversely affect habitat critical to the survival of an ecological community

No habitat critical to the survival of this species has been identified as per section 207A of the EPBC Act, or on the Register of Critical Habitat (DCCEEW, 2023). Since this ecological community is considered highly fragmented and degraded, all areas of the ecological community that meet the minimum condition criteria outlined in section 2.3 of its Approved Conservation Advice should be considered habitat critical to the survival of this CEEC (DCCEEW, 2023). Applying this criteria to the project, it is considered that the 0.22 ha of the CEEC proposed to be removed is classified as habitat critical to the survival of this ecological community.

Since removal of this CEEC patch cannot be avoided, mitigation measures to minimise and offset impacts are stated under the conclusion section and should be adhered to.

d) 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 project proposes to remove 0.22 ha of this CEEC to widen an existing access track, which would substantially modify abiotic factors in this particular area. Nutrients would be stripped from the soil, while the soil would be modified to accommodate the access track extension. It is also noted that this patch is disturbed from historic and current land use as a result of construction of the existing access track. Assessing the action against hydrology, the patch of vegetation proposed to be removed contains two streams that flow from north to south, through the middle of the area. One stream is a 4th Order Strahler stream, and the other is Paper Forest Creek, a 5th Order Strahler stream. Soil disturbance may impact vegetation including woodland, downstream of the development footprint, but this is not classified as the CEEC. The proposed clearing would not reduce groundwater levels as the project does not include excavation. Mitigation measures are recommended and would be implemented to prevent sedimentation and erosion downstream of the development footprint.

Considering the above factors, it is not considered likely that the proposed action would significantly modify or destroy abiotic factors necessary for the survival of this ecological community.

e) 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 area of vegetation to be removed is directly adjacent to an existing access track and contains one hollow-bearing *Eucalyptus blakelyi*. The project would cause permanent disturbance via clearing of this hollow-bearing tree, which contains two hollows – diameters of approximately 11-20 cm and 20-40 cm, with a DBH of 151 cm. Although there were no signs of use at time of observation, multiple threatened fauna species have the potential to be utilising this tree and the 0.22 ha patch.

Nationally threatened fauna that may utilise this CEEC include the following species:

- Superb Parrot (*Polytelis swainsonii*)
- Striped Legless Lizard (*Delma impar*)
- Sloane's Froglet (*Crinia sloanei*)
- Pink-tailed Legless Lizard (*Aprasia parapulchella*)
- Golden Sun Moth (*Synemon plana*)
- South-eastern Glossy Black Cockatoo (*Calyptorhynchus lathami lathami*)
- Gang-gang Cockatoo (*Callocephalon fimbriatum*)
- Pink Cockatoo (*Lophochroa leadbeateri*)

Since the action proposes to clear this area of CEEC, the species composition would be reduced to zero and replaced with suitable materials to extend the existing access track. Considering the listed factors, the action is likely to substantially change the species composition of this ecological community in the development footprint.

However, the species composition of the retained CEEC within the subject land and wider locality is not likely to be significantly altered, with minimal indirect impacts. This is due to the surrounding patch already being disturbed by current grazing, vehicle and machinery disturbance, as well as previous disturbance from clearing for the existing access track.

f) 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, or
- 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, or

The CEEC within the development footprint and subject land is in moderate condition, with evidence of regeneration by a BAM-accredited senior ecologist. It is important to note that observations through site visits indicate the CEEC is in a highly disturbed state, as a result of grazing, trampling, vehicle movements and other agricultural activities. The project includes proposed clearing of 3% ha of this CEEC within the local patch, therefore reducing the quality and integrity by a minimal amount in comparison to the retained CEEC area (7.14 ha).

The proposed action is not likely to utilise fertilizers or use herbicides beyond what would already occur on the subject land for general maintenance. Unclean vehicles and machinery on site have the potential to introduce new weed seeds or spread existing weeds, leading to new weed outbreaks. These impacts can be easily mitigated through standard biosecurity practices, including vehicle and machinery checks for soil and plant matter. These should be cleaned prior to entering the project site to avoid introducing new weeds or pathogens.

Considering the listed factors, the proposed action is likely to cause a substantial reduction in the quality and integrity of the 0.22 ha to be cleared, but it is not likely to have a significant impact on 97% of the retained local patch of CEEC if biosecurity practices are adhered to.

g) interfere with the recovery of an ecological community.

This CEEC has been primarily impacted by changes to soil nutrient levels, land clearing, inappropriate grazing and weed invasion.

The main threats to this CEEC associated with the proposed action include:

- Permanent impact through 0.22 ha of CEEC vegetation clearing
- Potential for contamination, colonisation/spread of invasive flora during clearing, affecting the long-term health of the adjacent retained CEEC

The subject land contains 0.57 ha of this ecological community, with 7.36 ha of this community in the local patch; therefore, 7.14 ha (97%) of the local patch would be retained. No clearing is proposed outside of the development footprint. Where impacts cannot be completely avoided, they should be minimised through the following methods:

- Protecting large mature trees and trees with hollows
- Retaining and avoiding damage to high quality patches

Mitigation measures include:

- Delineation of clearing (impact) areas to avoid inadvertent impacts upon adjacent (retained) vegetation
- Avoid use of herbicides, pesticides and fertilizers
- Reduce impacts of grazing and agricultural effects
- Minimise spread of invasive weeds through standard biosecurity practices
- Offsetting and revegetation of cleared CEEC

The recovery plan lists a range of objectives to minimise the risk of extinction of this ecological community. Applicable objectives to the proposed project include:

- Increasing protection of sites with high recovery potential
- Achieving no net loss in extent and condition of the ecological community throughout its geographic distribution

Due to the proposed clearing of 0.22 ha of confirmed CEEC (3% of the local patch), and in consideration of the above factors, the proposed action is not likely to interfere with the recovery of this ecological community.

h) Conclusion.

The proposed works for this project include clearing of 0.22 ha of *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland*. Inside the subject land and development footprint, this CEEC is in moderate condition, with stock grazing, weed presence, trampling and vehicular movements contributing to the degradation of the landscape.

The proposed development footprint is 0.22 ha, or 3% of the local patch of this CEEC, occurring as a result of vegetation clearing as part of the project. The proposed project is not likely to significantly increase fragmentation and edge effects of this CEEC. The proposed works are expected to modify or destroy abiotic factors affecting habitat structures and potential faunal movements within the development footprint only (0.22 ha). This is primarily due to the proposed clearing of a large HBT that is likely over 200 years old, in addition to the other native vegetation in this CEEC that would be removed. The proposed project

may cause exotic or invasive plants to spread, and may introduce new weeds to the area during clearing, construction and operational phases. However, If mitigation measures are followed and biosecurity practices are in place, the risk of weed introduction and spread is expected to be minimal.

The primary recommendation for *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* is to avoid further clearing of this CEEC and preserve vegetation communities that meet the criteria for this ecological community (DCCEEW, 2023). Since impacts cannot be avoided to 0.22 ha inside the development footprint, a number of mitigation measures are recommended to minimise impacts to the retained CEEC area (7.14 ha). Recommendations include:

- Vehicles and machinery to be checked for soil and plant matter and washed-down prior to entering the site
- Brushing and cleaning boots if walking through CEEC area
- Clear delineation of vegetation to be cleared or retained
- Avoid the use of herbicides and pesticides post-clearing
- Revegetation of cleared vegetation
- Offsetting 0.22 ha of cleared CEEC

Although there is a small area (3%) of the local patch being directly impacted by the proposal through clearing, it is unlikely that the action would significantly impact the local patch of *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland*, or the wider ecological community.

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Appendix C Matters of national environmental significance

C.1 Protected matters search report

An EPBC Act Protected Matters Report was generated on April 7th 2025 to identify Matters of National Environmental Significance (MNES) that have the potential to occur within 10 km of the Development Footprint (Appendix C.8). Those relevant to this BDAR include:

- Threatened species
- Threatened ecological communities
- Migratory species

The potential for these MNES to occur at the site are discussed below.

C.2 Summary of habitat in Subject Land

The Subject Land is dominated by cropped paddocks, as well as native grassland and woodland. The entire Subject Land is located in an agricultural use area, both historically and presently. This has impacted vegetation in general across the Subject Land, with some areas in higher condition than others. Regeneration of woodland is evident in multiple areas of the Subject Land. Wooded areas are generally in better condition than grassland areas, with trees containing hollows that provide habitat for fauna, including arboreal mammals and birds. Paddocks generally have a high cover of exotic groundcover species as a result of landscape modification. Native ground cover includes grasses, forbs and a low abundance of sedges. There is an absence of mid-stratum (shrubs) and rocky habitat within the Subject Land. Aquatic habitat consists of multiple ephemeral creek streams which contain some aquatic vegetation.

C.3 Ramsar wetlands of international importance

The EPBC Act Protected Matters Report identified the following four Ramsar Wetlands of International Importance downstream of the Subject Land:

- Banrock Station Wetland Complex, 600 - 700 km downstream of the search area (Subject Land and 10 km buffer)
- Hattah-kulkyne Lakes, 400 – 500 km downstream
- Riverland, 500 – 600 km downstream
- The Coorong, and Lakes Alexandrina and Albert Wetland, 600 – 700 km downstream.

The closest Ramsar Wetland of International Importance is the Hattah-kulkyne Lakes, approximately 400 – 500 km downstream of the search area (Subject Land and 10 km buffer). Hattah-kulkyne Lakes and the remaining three wetlands are considered too far downstream to influence or be influenced by the development.

C.4 Threatened ecological communities (TECs)

The EPBC Act Protected Matters Report identified the following three Threatened Ecological Communities:

- Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of south-eastern Australia
- Weeping Myall Woodlands
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

Field investigations including VI plots determined that Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of south-eastern Australia and White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland occur within the Subject Land. White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland also occurs within the Development Footprint. An AoS was completed for the TEC, which determined that the proposal is unlikely to have any significant impacts on this TEC (Appendix B). The woodland meeting the criteria for Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of south-eastern Australia would not be impacted by the proposal.

Weeping Myall Woodlands was absent from the Subject Land.

C.5 Threatened species

The EPBC Act Protected Matters Report identified 41 threatened species with the potential to occur within the search area. The full list of species is provided in the Habitat Evaluation Table. Of these species, 24 were identified through habitat assessment and the BAM-C as either being present, or having the potential to utilise habitat found within the Development Footprint:

Flora

- A spear-grass (*Austrostipa wakoolica*)
- Eyebright (*Euphrasia arguta*)
- Leafless Indigo (*Indigofera efoliata*)
- *Prasophyllum* sp. *Wybong*
- Sand-hill Spider Orchid (*Caladenia arenaria*)
- Small Purple-pea (*Swainsona recta*)
- Tarengo Leek Orchid (*Prasophyllum petilum*)
- Yass Daisy (*Ammobium craspedioides*).

Fauna

- Brown Treecreeper (eastern subspecies) (*Climacteris picumnus victoriae*)
- Corben's Long-Eared Bat (*Nyctophilus corbeni*)
- Diamond Firetail (*Stagonopleura guttata*)
- Gang-gang Cockatoo (*Callocephalon fimbriatum*)
- Golden Sun Moth (*Synemon plana*)
- Pink Cockatoo (*Lophochroa leadbeateri*)
- Pink-tailed Legless Lizard (*Aprasia parapulchella*)
- Regent Honeyeater (*Anthochaera phrygia*)
- Sloane's Froglet (*Crinia sloanei*)
- South-eastern Glossy Black Cockatoo (*Calyptorhynchus lathami lathami*)
- South-eastern Hooded Robin (*Melanodryas cucullata cucullata*)
- Southern Whiteface (*Aphelocephala leucopsis*)
- Striped Legless Lizard (*Delma impar*)
- Superb Parrot (*Polytelis swainsonii*)
- Swift Parrot (*Lathamus discolor*)
- White-throated Needletail (*Hirundapus caudacutus*).

Targeted surveys were undertaken for Leafless Indigo, *Prasophyllum* sp. *Wybong*, Sand-hill Spider Orchid, Small Purple-pea, Tarengo Leek Orchid, Gang-gang Cockatoo, Pink Cockatoo, Sloane's Froglet, South-eastern Glossy Black Cockatoo and Superb Parrot and not detected. Detailed assessments in the form of AoSs under the EPBC Act were completed for the remaining of the above listed threatened species (Appendix B).

The results of the AoS determined that although there will be some minor impacts on species habitat, it is unlikely that there will be any significant impacts on nationally-threatened species.

C.6 Migratory species

The EPBC Act Protected Matters Report identified eight listed migratory species with the potential to occur within the search area. The full list of species is provided in the Habitat Evaluation Table included in the table below in section C.7. Of these species, three were identified through the habitat assessment and the BAM-C as being either present, assumed present or having the potential to utilise habitat found within the Development Footprint:

- Fork-tailed Swift (*Apus pacificus*)
- White-throated Needletail (*Hirundapus caudacutus*)
- Yellow Wagtail (*Motacilla flava*).

Detailed assessments in the form of AoSs under the EPBC Act were completed for each of the above listed migratory species (Appendix B), however all assessments determined that it is unlikely there would significant impacts to each species or TEC. The EPBC referral concluded that the Project is not a controlled action, hence agreeing the impacts are unlikely to be significant.

C.7 MNES habitat evaluation

Please see overleaf.

Threatened Ecological Communities

Name	BC Act	EPBC Act	Habitat	Presence of habitat	Likelihood of occurrence	Potential impact
<i>White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland</i>	Not Listed	CE	Can occur either as woodland or derived native grassland (i.e. grassy woodland where the tree overstorey has been removed). The groundcover is characterised by a species-rich understorey of native tussock grasses, herbs and scattered shrubs. The most commonly encountered species include Kangaroo Grass (<i>Themeda australis</i>), Poa Tussock (<i>Poa sieberiana</i>), wallaby grasses (<i>Rytidosperma</i> spp.), spear-grasses (<i>Austrostipa</i> spp.), Common Everlasting (<i>Chrysocephalum apiculatum</i>), Scrambled Eggs (<i>Goodenia pinnatifida</i>), Small St John's Wort (<i>Hypericum gramineum</i>), Narrow-leafed New Holland Daisy (<i>Vittadinia muelleri</i>) and blue-bells (<i>Wahlenbergia</i> spp.). The overstorey is characterised by the presence or prior occurrence of White Box (<i>Eucalyptus albens</i>), Yellow Box (<i>E. melliodora</i>) and/or Blakely's Red Gum (<i>E. blakelyi</i>). In the Nandewar Bioregion, Grey Box (<i>E. macrocarpa</i> or <i>E. moluccana</i>) may also be dominant.	Marginal Characteristic species of overstorey are present, with presence of few characteristic understorey species.	Present Vegetation recorded in the western section of the Subject Land meets the criteria for this TEC.	Yes 0.22 ha of this TEC will be directly impact. 7.14 ha will be retained but may be indirectly impacted. An AoS has been completed.
<i>Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia</i>	Not Listed	E	Usually occurs in flat to undulating landscapes such as plains, low slopes and rises, or occasionally in drainage depressions. Patches tend to occur on relatively productive soils. Predominantly occurs on the drier edge of the temperate grassy eucalypt woodland belt, in areas with 375-700 mm rainfall. Most commonly occurs as grassy woodland with a tree canopy that is dominated or co-dominated by Grey Box (<i>Eucalyptus microcarpa</i>) and a native understorey with varying proportions of	Marginal Characteristic species of overstorey are present, with presence of few characteristic	Present Vegetation recorded in the western section of the Subject Land meets the	No TEC does not occur within the Development Footprint. Minor indirect

Name	BC Act	EPBC Act	Habitat	Presence of habitat	Likelihood of occurrence	Potential impact
			life forms. Widespread shrubs include wattles (<i>Acacia</i> spp.), Sweet Bursaria (<i>Bursaria spinosa</i>), Cassinia spp., Hop-bushes (<i>Dodonaea</i> spp.), Emu Bushes (<i>Eremophila</i> spp.) and Blue-bushes (<i>Maireana</i> spp.). Common grasses or grass-like plants include: Wallaby grasses (<i>Rytidosperma</i> spp.), Spear-grasses (<i>Austrostipa</i> spp.), Wheat-grass (<i>Elymus scaber</i>), Windmill grasses (<i>Enteropogon</i> spp.), Flax-lilies (<i>Dianella</i> spp.) and Mat-rushes (<i>Lomandra</i> spp.). Chenopod species commonly present include Saloop (<i>Einadia hastate</i>), Nodding Saltbush (<i>Einadia nutans</i> sp. <i>nutans</i>), Ruby Saltbush (<i>Enchylaena tomentose</i>), Wingless Bluebush (<i>Maireana enchylaenoides</i>) and Grey Copperburr (<i>Sclerolaena diacantha</i>). Herbaceous flowering plants include: Vanilla Lilies (<i>Arthropodium</i> spp.), Milkmaids (<i>Burchardia umbellate</i>) and Twining Fringe-lilies (<i>Thysanotus patersonii</i>). Patches of derived native grassland can occur where the tree canopy and midstorey have been almost entirely removed, where the ground layer is native and is mostly intact.	understorey species.	criteria for this TEC.	impacts may occur.

Threatened Species

Scientific Name Common Name	Listing status		Habitat	No. of records within 10 km	Presence of habitat	Likelihood of occurrence	Potential impact
	BC Act	EPBC Act					
BIRD							
Actitis hypoleucos Common Sandpiper	Not Listed	M Marine	Found along all coastlines of Australia and in many areas inland. The population that migrates to Australia breeds in the Russian far east. Roost sites are typically on rocks or in roots or branches of vegetation, especially mangroves. The species utilises a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around muddy margins or rocky shores and rarely on mudflats. Has been recorded in estuaries and deltas of streams, as well as on banks farther upstream; around lakes, pools, billabongs, reservoirs, dams and claypans, and occasionally piers and jetties. The muddy margins utilised by the species are often narrow, and may be steep. The species is often associated with mangroves, and sometimes found in areas of mud littered with rocks or snags. The species is known to perch on posts, jetties, moored boats and other artificial structures, and to sometimes rest on mud or 'loaf' on rocks.	0 (PMST)	Absent Lack of suitable habitat within the Subject Land.	Unlikely Species unlikely to be present due to absence of habitat and no records within the locality.	No Absence of suitable habitat, records and unlikely to occur.
Anthochaera phrygia Regent Honeyeater	CE	CE	Known breeding areas include Bundarra-Barraba, Capertee Valley, Hunter Valley, and Chiltern. Inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. Inhabits woodlands that support a significantly high abundance and species richness, particularly with large numbers of mature trees, high canopy cover and abundance of mistletoes.	0 (PMST)	Marginal Woodland present including White Box and Yellow	Unlikely Habitat present within Development Footprint and	Yes Impacts to foraging habitat. Presence assumed.

Scientific Name Common Name	Listing status		Habitat	No. of records within 10 km	Presence of habitat	Likelihood of occurrence	Potential impact
	BC Act	EPBC Act					
			Feeds mainly on the nectar from a relatively small number of eucalypts that produce high volumes of nectar. Key eucalypt species include Mugga Ironbark, Yellow Box, White Box and Swamp Mahogany. Other tree species may be regionally important. Flowering of associated species such as Thin-leaved Stringybark (<i>Eucalyptus eugenioides</i>) and other Stringybark species, and Broad-leaved Ironbark (<i>E. fibrosa</i>) can also contribute important nectar flows at times. Nectar and fruit from the mistletoes (<i>Amyema miquelii</i> , <i>A. pendula</i> and <i>A. cambagei</i>) are also utilised.		Box trees. Lack of species diversity and mistletoe.	Subject Land.	An AoS has been undertaken.
<i>Aphelocephala leucopsis</i> Southern Whiteface	V	V	Occurs 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. Forage almost exclusively on the ground, favouring habitat with low tree densities and an herbaceous understorey litter cover.	1 (BioNet)	Present Suitable habitat present including open woodlands and foraging habitat.	Possible Habitat present within Development Footprint and Subject Land.	Yes Impacts to habitat. Presence assumed. Mitigation measures have been outlined in the BDAR. An AoS has been undertaken.
<i>Apus pacificus</i>	Not Listed	M Marine	A non-breeding migrant to Australia. Widespread across Australia and territories arriving in north-west Australia in October and November. From this entry point birds expand through southern WA	0 (PMST)	Marginal Potential suitable	Possible Habitat present	Yes Impacts to habitat.

Scientific Name Common Name	Listing status		Habitat	No. of records within 10 km	Presence of habitat	Likelihood of occurrence	Potential impact
	BC Act	EPBC Act					
Fork-tailed Swift			and much of mainland Australia, typically arriving in Victoria in December and January and departing in April, to return to northern breeding areas (east Asia from Siberia to Japan and South to Indochina and northern Thailand). The species is almost entirely aerial, flying from less than 1 m to at least 300 m above ground. In Australia, they mostly occur over inland plains but sometimes above foothills or in coastal areas. They often occur over cliffs and beaches and also over islands and sometimes well out to sea. They also occur over settled areas, including towns, urban areas and cities. They mostly occur over dry or open habitats, including riparian woodland and tea-tree swamps, low scrub, heathland or saltmarsh. They are also found at treeless grassland and sandplains covered with spinifex, open farmland and inland and coastal sand-dunes. They sometimes occur above rainforests, wet sclerophyll forest or open forest or plantations of pines.		habitat present including grassland and open farmland.	within Development Footprint and Subject Land.	Presence assumed. Mitigation measures have been outlined in the BDAR. An AoS has been undertaken.
<i>Botaurus poiciloptilus</i> Australasian Bittern	E	E	Favours permanent freshwater wetlands with tall, dense vegetation, particularly <i>Typha</i> spp. and <i>Eleocharis</i> spp.. Hides during the day amongst dense reeds or rushes and feed mainly at night on frogs, fish, yabbies, spiders, insects and snails. Feeding platforms may be constructed over deeper water from reeds trampled by the bird; platforms are often littered with prey remains. Breeding occurs in summer from October to January; nests are built in secluded places in densely-vegetated wetlands on a platform of reeds; there are usually six olive-brown eggs to a clutch. Mainly found	0 (PMST)	Absent Lack of suitable habitat within Subject Land.	Unlikely Species unlikely to be present due to absence of habitat and no records	No Absence of suitable habitat, records and unlikely to occur.

Scientific Name Common Name	Listing status		Habitat	No. of records within 10 km	Presence of habitat	Likelihood of occurrence	Potential impact
	BC Act	EPBC Act					
			in shallow wetlands (less than 1 m deep) with dense growth of rushes or sedges.			within the locality.	
<i>Calidris acuminata</i> Sharp-tailed Sandpiper	Not Listed	V M Marine	Spends the non-breeding season in Australia. 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. In Australasia, the species 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, sedgeland and other ephemeral wetlands, but leave when they dry. They use intertidal mudflats in sheltered bays, inlets, estuaries or seashores, and also 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 beachcast seaweed. Sometimes they occur on rocky shores and rarely on exposed reefs.	0 (PMST)	Absent Lack of suitable habitat within Subject Land.	Unlikely Species unlikely to be present due to absence of habitat and no records within the locality.	No Absence of suitable habitat, records and unlikely to occur.
<i>Calidris ferruginea</i>	CE	CE M Marine	Occurs along the entire coast of NSW, particularly in the Hunter Estuary, and sometimes in freshwater wetlands in the Murray-Darling	0 (PMST)	Absent Lack of suitable	Unlikely Species unlikely to be	No Absence of suitable

Scientific Name Common Name	Listing status		Habitat	No. of records within 10 km	Presence of habitat	Likelihood of occurrence	Potential impact
	BC Act	EPBC Act					
Curlew Sandpiper			Basin. Inland records are probably mainly of birds pausing for a few days during migration. Breeds in Siberia and migrates to Australia for the non-breeding period, arriving between August and November, and departing between March and mid-April. Generally occupies littoral and estuarine habitats, and in NSW is mainly found in intertidal mudflats of sheltered coasts. It also occurs in non-tidal swamps, lakes and lagoons on the coast and sometimes inland. It forages in or at the edge of shallow water, occasionally on exposed algal mats or waterweed, or on banks of beach-cast seagrass or seaweed. Roosts on shingle, shell or sand beaches; spits or islets on the coast or in wetlands; or sometimes in salt marsh, among beach-cast seaweed, or on rocky shores. Feeds on worms, molluscs, crustaceans, insects and some seeds.		habitat within Subject Land.	present due to absence of habitat and no records within the locality.	habitat, records and unlikely to occur.
<i>Callocephalon fimbriatum</i> Gang-gang Cockatoo	E	E	Endemic to south-eastern Australia from southern Victoria through south- and central-eastern NSW. In NSW, it is distributed from the south-east coast to the Hunter region, and inland to the Central Tablelands and south-west slopes. It occurs regularly in the ACT. Primarily occurs within the temperate eucalypt forests and woodlands of mainland south-east Australia. The species is an altitudinal migrant. Favours old growth forest and woodland attributes for nesting and roosting. Nests are located in hollows that are 7cm in diameter or larger in eucalypts and 3m or more above the ground.	0 (PMST)	Present Suitable habitat present including eucalypt woodland and grassland.	Unlikely Suitable habitat present but is outside known distribution. Targeted surveys	No Absence of species from Subject Land.

Scientific Name Common Name	Listing status		Habitat	No. of records within 10 km	Presence of habitat	Likelihood of occurrence	Potential impact
	BC Act	EPBC Act					
			During summer months, they primarily inhabit mature, wet sclerophyll forests, typically dominated by eucalypts. Eucalypt-dominated assemblages with dense, shrubby acacia, wattle and banksia understory support the highest density of birds. The species has also been reported in more open eucalypt assemblages, subalpine Snow Gum woodland, temperate rainforests, and occasionally regenerating forests. They regularly feed on flower buds and seed pods, but also on blossoms, leaf buds, fruits, seeds and also insect larvae. During winter months, they tend to range beyond montane forests to inhabit woodland assemblages at lower, drier altitudes. Most birds occur in open eucalypt assemblages during this period. Occasionally inhabits assemblages of River Red Gum (<i>Eucalyptus camaldulensis</i>), dense coastal thickets of <i>Leptospermum</i> or <i>Casuarina</i>, or heathland. The species is also observed in suburban areas of cities including within parks, gardens, and roadside tree plantations.			determined this species is absent from the Subject Land.	
<i>Calyptorhynchus lathami</i> South-eastern Glossy Black-Cockatoo	V	V	This species utilises large hollows for nesting, in both living and dead eucalypt trees. They are known to nest in Narrow-leaved Ironbark (<i>Eucalyptus crebra</i>), Blue-leaved Ironbark (<i>E. nubila</i>) and Blakely's Red Gum (<i>E. blakelyi</i>). South-eastern Glossy Black-Cockatoos are known to nest in River Red Gum trees (<i>E. camaldulensis</i>) along the Murrumbidgee River and other inland waterways. They feed almost exclusively on the seeds of Sheoak (<i>Allocasuarina</i> spp. and <i>Casuarina</i> spp.). Potential nest hollows have the following traits: Located in branches >30 cm in diameter	0 (PMST)	Marginal Suitable nesting habitat present including eucalypt trees with suitable	Unlikely Marginal habitat present, however targeted surveys determined	No Absence of species from Subject Land.

Scientific Name Common Name	Listing status		Habitat	No. of records within 10 km	Presence of habitat	Likelihood of occurrence	Potential impact
	BC Act	EPBC Act					
			>8 m above ground - Branch or stem no more than 45° from vertical - Minimum entrance diameter of >15 cm.		nest hollows.	this species is absent.	
<i>Calidris melanotos</i> Pectoral Sandpiper	Not Listed	M Marine	This species is a regular, uncommon, non-breeding migrant from the Siberian and American Arctic. Mostly sighted in south-eastern Australia, in the Murray-Darling Basin and western Victoria. In Australasia, the species prefers shallow fresh to saline wetlands. The species is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands. The species is usually found in coastal or near coastal habitat but occasionally found further inland. It prefers wetlands that have open fringing mudflats and low, emergent or fringing vegetation, such as grass or samphire. The species has also been recorded in swamp overgrown with lignum. They forage in shallow water or soft mud at the edge of wetlands.	0 (PMST)	Marginal Limited habitat in Subject Land including ephemeral creeks.	Unlikely Species unlikely to be present due to absence of habitat and no records within the locality.	No Absence of suitable habitat, records and unlikely to occur.
<i>Climacteris picumnus victorae</i> Brown Treecreeper (eastern subspecies)	V	V	Endemic to south-eastern Australia from the Grampians in western Victoria, through central NSW to the Bunya Mountains in Queensland, and from the coast to the inland slopes of Great Dividing Range. In NSW the western boundary of the range runs approximately through Corowa, Wagga Wagga, Temora, Forbes, Dubbo and Inverell. Found in eucalypt woodlands (including Box-Gum, stringybarks or other rough-barked eucalypts) and dry open forest of the inland slopes and plains inland of the Great Dividing Range. Mainly inhabits	114 (BioNet)	Present Suitable habitat present including Box-Gum Woodland.	Possible Habitat present within Development Footprint and	Yes Impacts to habitat. Presence assumed. Mitigation measures have been

Scientific Name Common Name	Listing status		Habitat	No. of records within 10 km	Presence of habitat	Likelihood of occurrence	Potential impact
	BC Act	EPBC Act					
			woodlands dominated with an open grassy understorey, sometimes with one or more shrub species. Also found in mallee and River Red Gum (<i>Eucalyptus camaldulensis</i>) 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. Terrestrial and arboreal in about equal proportions. Active, noisy and conspicuous while foraging on trunks and branches of trees and amongst fallen timber. Spend much more time foraging on the ground and fallen logs than other treecreepers.			Subject Land.	outlined in the BDAR. An AoS has been undertaken.
<i>Falco hypoleucos</i> Grey Falcon	V	V	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, and near wetlands where surface water attracts prey. Preys primarily on birds, especially parrots and pigeons, using high-speed chases and stoops; reptiles and mammals are also taken. Utilises old nests of other birds of prey and ravens, usually high in a living eucalypt near water or a watercourse; peak laying season is in late winter and early spring. Sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. Believed to be extinct in areas with more than 500 mm rainfall in NSW.	0 (PMST)	Marginal Limited habitat in Subject Land including grassland.	Unlikely Species unlikely to be present due to absence of habitat and no records within the locality.	No Absence of suitable habitat, records and unlikely to occur.
<i>Gallinago hardwickii</i>	V	V M	A non-breeding visitor to much of eastern Australia. Most birds spend the non-breeding period at sites located south of the Richmond River	0 (PMST)	Marginal	Unlikely	No

Scientific Name Common Name	Listing status		Habitat	No. of records within 10 km	Presence of habitat	Likelihood of occurrence	Potential impact
	BC Act	EPBC Act					
Latham's Snipe, Japanese Snipe		Marine	in NSW. Known to occur in the upland wetlands of the New England Tablelands and Monaro Plateau. In Australia, the species 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). 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.		Limited habitat present in Subject Land.	Species unlikely to be present due to absence of habitat and no records within the locality.	Absence of suitable habitat, records and unlikely to occur.
<i>Grantiella picta</i> Painted Honeyeater	V	V	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 (<i>Acacia pendula</i>), Brigalow (<i>A. harpophylla</i>) 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 <i>Amyema</i>. Nest from spring to autumn in a small, delicate nest hanging within the outer canopy of drooping eucalypts, she-oak, paperbark or mistletoe branches.	0 (PMST)	Marginal Box-Gum Woodlands present however mistletoes are absent from Subject Land.	Unlikely Species unlikely to be present due to absence of habitat and no records within the locality.	No Absence of suitable habitat, records and unlikely to occur.
<i>Hirundapus caudacutus</i>	V	V M	Arrive in eastern Australia from their breeding grounds in the northern hemisphere in about October each year and leave	0 (PMST)	Marginal Potential suitable	Possible Habitat present	Yes Impacts to habitat.

Scientific Name Common Name	Listing status		Habitat	No. of records within 10 km	Presence of habitat	Likelihood of occurrence	Potential impact
	BC Act	EPBC Act					
White-throated Needletail		Marine	somewhere between May and August. More common in coastal areas, less so inland. Almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground. Occur over most types of habitat, 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. 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.		habitat present including woodland, grassland and farmland.	within Development Footprint and Subject Land.	Presence assumed. Mitigation measures have been outlined in the BDAR. An AoS has been undertaken.
<i>Lathamus discolor</i> Swift Parrot	C	CE Marine	Breeds in Tasmania during spring and summer, migrating in the autumn and winter months to south-eastern Australia from Victoria and the eastern parts of South Australia to south-east Queensland. In NSW mostly occurs on the coast and south-west slopes. On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany (<i>Eucalyptus robusta</i>), Spotted Gum (<i>Corymbia maculata</i>), Red Bloodwood (<i>C. gummifera</i>), Forest Red Gum (<i>E. tereticornis</i>), Mugga Ironbark (<i>E. sideroxylon</i>), and White Box (<i>E. albens</i>).	46 (BioNet)	Present Woodland present including White Box, Inland Grey Box and Yellow Box trees.	Possible Habitat present within Development Footprint and Subject Land.	Yes Impacts to foraging habitat. Mitigation measures have been outlined in the BDAR. Presence assumed. An AoS has

Scientific Name Common Name	Listing status		Habitat	No. of records within 10 km	Presence of habitat	Likelihood of occurrence	Potential impact
	BC Act	EPBC Act					
			Commonly used lerp infested trees include Inland Grey Box (<i>E. microcarpa</i>), Grey Box (<i>E. moluccana</i>), Blackbutt (<i>E. pilularis</i>), and Yellow Box (<i>E. melliodora</i>).				been undertaken.
<i>Lophochroa leadbeateri</i> Pink Cockatoo	V	E	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. Normally found in pairs or small groups, though flocks of hundreds may be found where food is abundant. Nesting, in tree hollows, occurs throughout the second half of the year; nests are at least 1 km apart, with no more than one pair every 30 square kilometres. Suitable nesting hollows typically found across arid and semi-arid woodlands, mainly in eucalypts or cypress pines and are usually large old trees. The species is known to forage on seeds of native shrubs and trees, and sometimes forages on roots, bulbs, insect larvae, seeds of crops and weeds. They prefer to feed in or close to wooded areas, and use these areas for travel between sites. In fragmented landscapes, they tend to travel along vegetated corridors and through roadside remnants.	0	Present Suitable habitat present including woodland, grassland and large old trees with hollows.	Unlikely Suitable habitat present, however targeted surveys determined this species is absent.	No Absence of species from Subject Land.
<i>Melanodryas cucullata cucullata</i>	E	E	Considered a sedentary species, but local seasonal movements are possible. Found from Brisbane to Adelaide and throughout much of inland NSW, with the exception of the extreme north-west.	6 (BioNet)	Present Suitable habitat present	Possible Habitat present within	Yes Impacts to habitat. Presence

Scientific Name Common Name	Listing status		Habitat	No. of records within 10 km	Presence of habitat	Likelihood of occurrence	Potential impact
	BC Act	EPBC Act					
South-eastern Hooded Robin, Hooded Robin			The species prefers dry eucalypt and acacia woodlands and shrublands with an open understorey, some grassy areas and a complex ground layer. Woodlands with tall trees or dense tree cover are generally avoided by the species, however they may occur in tall, dense heaths with scattered open areas. They are considered a sedentary species, but local seasonal movements are possible. In agricultural landscapes they prefer patches of habitat greater than 10 ha with moderately deep to deep soils, however they can occur in patches as small as 2.9 ha They forage on insects and small lizards, hunting for invertebrates in grassy clearings. Perches on low dead stumps and fallen timber or on low-hanging branches. Territories range from around 10 ha during the breeding season, to 30 ha in the non-breeding season. Nest is a small, neat cup of bark and grasses bound with webs, in a tree fork or crevice, from less than 1-5 m above the ground.		including eucalypt woodland and grassy areas.	Development Footprint and Subject Land.	assumed. Mitigation measures have been outlined in the BDAR. An AoS has been undertaken.
<i>Motacilla flava</i> Yellow Wagtail	Not Listed	M Marine	A regular wet season visitor to northern Australia. Increasing records in NSW suggest this species is an occasional but regular summer visitor to the Hunter River region. The species is considered a vagrant to Victoria, South Australia and southern Western Australia. Occupies a range of damp or wet habitats with low vegetation, from damp meadows, marshes, waterside pastures, sewage farms and bogs to damp steppe and grassy tundra. In the north of its range, it is also found in large forest clearings. Breeds from April to August, although this varies with latitude.	0 (PMST)	Marginal Potential suitable habitat including pastures.	Possible Habitat present within Development Footprint and Subject Land.	Yes Impacts to habitat. Presence assumed. Mitigation measures have been outlined in the BDAR.

Scientific Name Common Name	Listing status		Habitat	No. of records within 10 km	Presence of habitat	Likelihood of occurrence	Potential impact
	BC Act	EPBC Act					
							An AoS has been undertaken.
<i>Neophema chrysostoma</i> Blue-winged Parrot, Turquoise Parrot	V	V Marine	The species prefers dry eucalypt and acacia woodlands and shrublands with an open understorey, some grassy areas and a complex ground layer. Woodlands with tall trees or dense tree cover are generally avoided by the species, however they may occur in tall, dense heaths with scattered open areas. They are considered a sedentary species, but local seasonal movements are possible. In agricultural landscapes they prefer patches of habitat greater than 10 ha with moderately deep to deep soils, however they can occur in patches as small as 2.9 ha They forage on insects and small lizards, hunting for invertebrates in grassy clearings. Perches on low dead stumps and fallen timber or on low-hanging branches. Territories range from around 10 ha during the breeding season, to 30 ha in the non-breeding season. Nest is a small, neat cup of bark and grasses bound with webs, in a tree fork or crevice, from less than 1-5 m above the ground	27 (BioNet)	Marginal Suitable habitat present including grasslands and grassy woodlands.	Possible Marginal potential habitat present within Development Footprint and Subject Land.	No Minimal impacts to habitat.
<i>Pedionomus torquatus</i> Plains-wanderer	E	CE	Live in semi-arid, lowland native grasslands that typically occur on hard red-brown soils. These grasslands support a high diversity of plant species, including a number of state and nationally threatened species. Is a ground-dwelling grassland bird, which is cryptic and very difficult to observe during the day.	0 (PMST)	Absent Lack of suitable habitat and structure.	Unlikely Species unlikely to be present due to absence of habitat and	No Absence of suitable habitat, records

Scientific Name Common Name	Listing status		Habitat	No. of records within 10 km	Presence of habitat	Likelihood of occurrence	Potential impact
	BC Act	EPBC Act					
			Habitat structure appears to play a more important role than plant species composition. Preferred habitat typically comprises 50% bare ground, 10% fallen litter, and 40% herbs, forbs and grasses. Most grassland habitat is <5 cm high, but some vegetation up to a maximum of 30 cm is important for concealment, as long as grass tussocks are spaced 10-20 cm apart. During prolonged drought, the denudation of preferred habitats may force birds into marginal denser and taller grassland habitats that become temporarily suitable. Average home range of a single bird is about 12 ha. Breeding pairs have overlapping home ranges that total approximately 18 ha. 99% of records in NSW in the past 30 years come from an area of the western Riverina bounded by Hay and Narrandera on the Murrumbidgee River in the north, the Cobb Highway in the west, the Billabong Creek in the south, and Urana in the east.			no records within the locality.	and unlikely to occur.
<i>Polytelis swainsonii</i> Superb Parrot	V	V	Occurs only in south-eastern Australia. In NSW, it mostly occurs west of the Great Divide, where it mainly inhabits the Riverina, the South West Slopes and Southern Tableland Regions: west to Mathoura, Boorooban, Goolgowi, and east to Canberra, Yass and Cowra. Inhabit Box-Gum, Box-Cypress-pine and Boree woodlands and River Red Gum forest. 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 and the Southern Tablelands, nest trees can be in open Box-Gum woodland or isolated living or dead paddock trees.	0 (PMST)	Present Suitable habitat present including Box-Gum Woodland and hollows for nesting.	Unlikely Suitable habitat present, however targeted surveys determined this species is absent.	No Absence of species from Subject Land.

Scientific Name Common Name	Listing status		Habitat	No. of records within 10 km	Presence of habitat	Likelihood of occurrence	Potential impact
	BC Act	EPBC Act					
			Species known to be used are Blakely's Red Gum, Yellow Box, Apple Box and Red Box. Nest in tree hollows with an entrance diameter of 6cm or wider, and that are at least 3.5m above the ground. <i>P. swainsonii</i> nests in trees with an average tree height ranging from 12 to 24 m, and a diameter at breast height of 113 cm. They have also been observed to utilise hollows with the following hollow measurements: • Minimum entrance diameter of eight to 12 cm • Depth of 59-112 cm • Floor diameter of 15-22 cm • Branch or stem diameter of 36-49 cm.				
<i>Rostratula australis</i> Australian Painted Snipe	E	E Marine	Endemic to Australia, it has been recorded in all mainland states, where the records are widely and sparsely scattered. Most records have come from eastern Australia, and most of these records are from the Murray–Darling Basin. Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. Nests on the ground amongst tall vegetation, such as grasses, tussocks or reeds. The nest consists of a scrape in the ground, lined with grasses and leaves.	0 (PMST)	Minimal Minimal habitat including dam fringes outside the Subject Land.	Unlikely Species unlikely to be present due to absence of habitat and no records within the locality.	No Absence of suitable habitat, records and unlikely to occur.
<i>Stagonopleura guttata</i>	V	V	Endemic to south-eastern Australia, extending from central Queensland to the Eyre Peninsula in South Australia. It is widely distributed in NSW, with a concentration of records from the	0 (PMST)	Present Suitable habitat	Possible Habitat present	Yes Impacts to habitat.

Scientific Name Common Name	Listing status		Habitat	No. of records within 10 km	Presence of habitat	Likelihood of occurrence	Potential impact
	BC Act	EPBC Act					
Diamond Firetail			Northern, Central and Southern Tablelands, the Northern, Central and South Western Slopes and the North West Plains and Riverina. Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum (<i>Eucalyptus pauciflora</i>) Woodlands. Also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities. Often found in riparian areas (rivers and creeks), and sometimes in lightly wooded farmland. Prefers areas with relatively low tree density, few large logs, and little litter cover but high grass cover. Feeds exclusively on the ground, on ripe and partly-ripe grass and herb seeds and green leaves, and on insects (especially in the breeding season). Usually encountered in flocks of between 5-40 birds, occasionally more. Groups separate into small colonies to breed, between August and January. Nests are globular structures built either in the shrubby understorey, or higher up, especially under hawk's or raven's nests. Appears to be sedentary, though some populations move locally, especially those in the south.		present including Box-Gum Woodland and lightly wooded farmland.	within Development Footprint and Subject Land.	Presence assumed. Mitigation measures have been outlined in the BDAR. An AoS has been undertaken.
CRUSTACEAN							
<i>Eustacus armatus</i> Murray Crayfish	V (Listed under the FM)	V	Endemic to lotic waters of the southern Murray-Darling Basin. Given its widespread distribution in stream habitat occurring through pasturelands to sclerophyll forest, and its occurrence in waterways on a spectrum from large rivers to small creeks, and particularly its	0 (PMST)	Assessed in Aquatic Assessment Report.	Assessed in Aquatic Assessment Report.	Assessed separately in EIS.

Scientific Name Common Name	Listing status		Habitat	No. of records within 10 km	Presence of habitat	Likelihood of occurrence	Potential impact
	BC Act	EPBC Act					
	Act 1994)		broad altitudinal range, it appears that the species is tolerant of a variety of in-stream habitat conditions. At a microhabitat scale, the species prefers cool, flowing-water habitats (lotic) proximal to clay banks for burrowing, and wood or rock cover is characteristic of occupied areas				
FISH							
<i>Galaxias rostratus</i> Flathead Galaxias, Beaked Minnow, Flat-headed Galaxias, Flat-headed Jollytail, Flat-headed Minnow	CE (Listed under the <i>FM Act 1994</i>)	CE	The flathead galaxias is only known from the southern half of the Murray-Darling Basin system. The flathead galaxias inhabits a variety of habitats including billabongs, lakes, swamps and rivers, with a preference for still or slow flowing waters. The species has a preference for schooling in midwater. There are indications that the flathead galaxias has a preference for moving upstream in November and December, however, little else is currently known about their ecology.	0 (PMST)	Assessed in Aquatic Assessment Report.	Assessed in Aquatic Assessment Report.	Assessed separately in EIS.
<i>Macquaria australasica</i> Macquarie Perch	E (Listed under the <i>FM Act 1994</i>)	E	Found in the Murray-Darling Basin (particularly upstream reaches) of the Lachlan, Murrumbidgee and Murray rivers, and parts of south-eastern coastal NSW, including the Hawkesbury/Nepean and Shoalhaven catchments.	0 (PMST)	Assessed in Aquatic Assessment Report.	Assessed in Aquatic Assessment Report.	Assessed separately in EIS.

Scientific Name Common Name	Listing status		Habitat	No. of records within 10 km	Presence of habitat	Likelihood of occurrence	Potential impact
	BC Act	EPBC Act					
	Act 1994)		Prefers clear water and deep, rocky holes with lots of cover. As well as aquatic vegetation, additional cover may comprise of large boulders, debris and overhanging banks.				
FROG							
<i>Crinia sloanei</i> Sloane's Froglet	E	E	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 NSW. It is typically associated with periodically inundated areas in grassland, woodland and disturbed habitats. 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 Couch (<i>Elymus repens</i>), <i>Watercouch</i> (<i>Paspalum pasplodes</i>) or the Common Spikerush (<i>Eleocharis acuta</i>). Waterbodies containing this type of vegetation are essential for the species as it lays its eggs attached to vegetation. Gilgai and other depressions are favoured habitat on clay plains, while elsewhere they are generally restricted to temporary ponds in the river valley and up to 8 km on either side of large rivers.	10 (BioNet)	Present Habitat present in the form of aquatic habitat and grassland adjacent to farm dams	Unlikely Presence of potential habitat, however targeted surveys determined this species is absent from the Subject Land and within 200 m of the Subject Land.	No Absence of species from Subject Land.

Scientific Name Common Name	Listing status		Habitat	No. of records within 10 km	Presence of habitat	Likelihood of occurrence	Potential impact
	BC Act	EPBC Act					
<i>Litoria raniformis</i> Southern Bell Frog, Growling Grass Frog, Green and Golden Frog, Warty, Swamp Frog, Golden Bell Frog	E	V	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. They are also found in irrigated rice crops, particularly where there is no available natural habitat. Breeding occurs during the warmer months and is triggered by flooding or a significant rise in water levels. Known to breed anytime from early spring through to late summer/early autumn (Sept to April) following a rise in water levels. During the breeding season animals are found floating amongst aquatic vegetation (especially cumbungi or Common Reeds) within or at the edge of slow-moving streams, marshes, lagoons, lakes, farm dams and rice crops. Tadpoles require standing water for at least 4 months for development and metamorphosis to occur but can take up to 12 months to develop. Outside the breeding season animals disperse away from the water and take shelter beneath ground debris such as fallen timber and bark, rocks, grass clumps and in deep soil cracks.	0 (PMST)	Marginal Minimal potential habitat in the form of farm dams, which are outside of the Subject Land.	Unlikely Species unlikely to be present due to minimal habitat and no records within the locality.	No Minimal habitat, lack of records and unlikely to occur.
INSECT							
<i>Keyacris scurra</i> Key's Matchstick Grasshopper	E	E	This species is usually found in native grasslands and open woodlands. Has been recorded in other vegetation associations containing a native understorey (especially disturbance tolerant grasses including, but not always, Kangaroo Grass (<i>Themeda triandra</i>)) and known food plants including Asteraceae.	0 (PMST)	Present Potential habitat present but Subject Land	Unlikely Marginal habitat present but is outside known	No Absence of species from

Scientific Name Common Name	Listing status		Habitat	No. of records within 10 km	Presence of habitat	Likelihood of occurrence	Potential impact
	BC Act	EPBC Act					
			Recent sightings have occurred in a wide range of vegetation types including wet sclerophyll forest, montane low forest, dry woodlands, heathland and montane grasslands. Has been observed to feed on a range of species including Silver Hairgrass (<i>Aira caryophyllea</i>), Sedges (<i>Scirpus sp.</i>), Early Nancy (<i>Wurmbea dioica</i>), Native Leek (<i>Bulbine bulbosa</i>), Red Beard Orchid (<i>Calochilus paludosus</i>), Curled Dock (<i>Rumex crispus</i>), Sorrel (<i>Acetosella vulgaris/Rumex acetosella</i>), Mouse-ear Chickweed (<i>Cerastium glomeratum</i>), Common Buttercup (<i>Ranunculus lappaceus</i>), Sweet Briar (<i>Rosa rubiginosa</i>), Orchid (<i>Acaena ovina</i>), Subterranean Clover (<i>Trifolium subterraneum</i>), Haresfoot Clover (<i>Trifolium arvense</i>), Poranthera microphylla, Creamy Candles (<i>Stackhousia monogyna</i>), Hibbertia sericea, Lavender (<i>Lavandula stoechas</i>), Vervain (<i>Salvia verbenaca</i>), Great Mullein (<i>Verbascum thapsus</i>), Field Madder (<i>Sherardia arvensis</i>), Rough Fruited Bedstraw (<i>Galium tricornatum</i>), Common Everlasting (<i>Helichrysum apiculatum</i>), Ozothamnus retusus or O. scaber (<i>Helichrysum bilobum</i>), Showy Copper-wire Daisy (<i>Podolepis jaceoides</i>) (<i>Podolepis acuminata</i>) and <i>Craspedia uniflora</i>.		occurs outside of its known range.	distribution. Targeted surveys determined this species is absent from the Subject Land.	Subject Land.
<i>Synemon plana</i> Golden Sun Moth	V	V	Occurs in Victoria, the ACT and NSW. The NSW and ACT subpopulations occur at elevations between 480 m and 720 m above sea level. Occurs in Natural Temperate Grasslands and grassy Box-Gum Woodlands in which ground layer is dominated by Wallaby Grasses	0 (PMST)	Present Habitat present in the form Box-Gum	Possible Species may occur within the Subject Land due to	Yes Presence assumed. Mitigation measures

Scientific Name Common Name	Listing status		Habitat	No. of records within 10 km	Presence of habitat	Likelihood of occurrence	Potential impact
	BC Act	EPBC Act					
			(<i>Austrodanthonia</i> spp.). The species is often restricted to discrete areas within grassy sites and breeding areas. In these areas, females are likely to be highly specialised and dependent on the presence of food plants and needle bare ground cover. Grasslands dominated by wallaby grasses are typically low and open - the bare ground between the tussocks is thought to be an important microhabitat feature, as it is typically these areas on which the females are observed displaying to attract males. Habitat may contain several Wallaby Grass species, which are typically associated with other grasses particularly Spear-grasses (<i>Austrostipa</i> spp.) or Kangaroo Grass (<i>Themeda australis</i>).		Woodlands and grassy area.	presence of habitat.	have been addressed in the BDAR. An AoS has been undertaken.
MAMMAL							
<i>Dasyurus maculatus maculatus</i> (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population)	V	E	The SE mainland population occurs in eastern Australia from south-eastern Queensland to western Victoria. 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. Use hollow-bearing trees, fallen logs, other animal burrows, small caves and rocky outcrops as den sites. Use communal "latrine sites", often on flat rocks among boulder fields, rocky cliff-faces or along rocky stream beds or banks.	0 (PMST)	Marginal Minimal potential suitable habitat present.	Unlikely Not recorded within locality and minimal habitat present.	No No observed dens within Subject Land.

Scientific Name Common Name	Listing status		Habitat	No. of records within 10 km	Presence of habitat	Likelihood of occurrence	Potential impact
	BC Act	EPBC Act					
			Home range between 200 to 4,000 ha and often traverse their home ranges along densely vegetated creeklines.				
<i>Nyctophilus corbeni</i> Corben's Long-eared Bat, South-eastern Long-eared Bat	V	V	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 (<i>Allocasuarina luehmannii</i>) 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.	0 (no previous records)	Present Habitat present including Box eucalypt-dominated communities.	Present Species detected through Anabat deployment.	Yes Species identified on site. Mitigation measures have been addressed in the BDAR. An AoS has been undertaken.
<i>Phascolarctos cinereus</i> (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland,	E	E	In NSW it mainly occurs on the central and north coasts with some populations in the west of the Great Dividing Range. 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 will select preferred browse species. Inactive for most of the day, feeding and moving mostly at night. Spend most of their time in trees but will descend and traverse open ground to move between trees. Home range size varies with quality of	0 (PMST)	Marginal Minimal potential suitable habitat present at edge of distribution range.	Unlikely Not recorded within locality, not observed during targeted species surveys.	No Not recorded within Subject Land during targeted surveys.

Scientific Name Common Name	Listing status		Habitat	No. of records within 10 km	Presence of habitat	Likelihood of occurrence	Potential impact
	BC Act	EPBC Act					
New South Wales and the Australian Capital Territory)			habitat, ranging from less than two ha to several hundred hectares in size.				
<i>Pteropus poliocephalus</i> Grey-headed Flying-fox	V	V	Australia's only endemic flying-fox, generally found within 200 km of the eastern coast of Australia, from Rockhampton in Queensland to Adelaide in South Australia. 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, or in vegetation with a dense canopy. Can travel up to 50 km from the camp to forage; commuting distances are more often less than 20 km. Feed on the nectar and pollen of native trees, in particular <i>Eucalyptus</i>, <i>Melaleuca</i> and <i>Banksia</i> spp., and fruits of rainforest trees and vines. Also forage in cultivated gardens and fruit crops.	0 (PMST)	Marginal Minimal potential suitable habitat present in the form of woodland.	Unlikely Not recorded within locality and lack of roosting camps.	No Not observed within Subject Land.
PLANT							
<i>Ammobium craspedioides</i>	V	V	Found in moist or dry forest communities, Box-Gum Woodland and secondary grassland derived from clearing of these communities.	3 (BioNet)	Present	Possible	Yes

Scientific Name Common Name	Listing status		Habitat	No. of records within 10 km	Presence of habitat	Likelihood of occurrence	Potential impact
	BC Act	EPBC Act					
Yass Daisy			Grows in association with a large range of eucalypts (<i>Eucalyptus blakelyi</i>, <i>E. bridgesiana</i>, <i>E. dives</i>, <i>E. goniocalyx</i>, <i>E. macrorhyncha</i>, <i>E. mannifera</i>, <i>E. melliodora</i>, <i>E. polyanthemos</i>, <i>E. rubida</i>). Apparently unaffected by light grazing, as populations persist in some grazed sites. Found in a number of TSRs, Crown reserves, cemeteries and roadside reserves within the region. E.g. near Crookwell on the Southern Tablelands to near Wagga Wagga on the South Western Slopes. Most populations are in the Yass region.		Suitable habitat present including Box-Gum Woodland and secondary grassland derived from clearing. Associated with <i>E. blakelyi</i> and <i>E. melliodora</i> present on site.	Species unlikely to be present due to agricultural land-use activities.	Presence assumed. An AoS has been undertaken.
<i>Amphibromus fluitans</i> River Swamp Wallaby-grass	V	V	Grows mostly in permanent swamps. The species requires 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 <i>Potamogeton</i> and <i>Chamaeraphis</i> species. The species is virtually aquatic, often with only the flower heads above the water.	0 (PMST)	Absent Permanent swamps, swamp margins and wetlands	Unlikely Species unlikely to be present due to absence of habitat and no records	No Absence of suitable habitat, records and unlikely to occur.

Scientific Name Common Name	Listing status		Habitat	No. of records within 10 km	Presence of habitat	Likelihood of occurrence	Potential impact
	BC Act	EPBC Act					
			It has been recorded recently in lagoons beside the Murray River near Cooks Lagoon (Shire of Greater Hume), Mungabarina Reserve, East Albury, at Ettamogah, Thurgoona (Charles Sturt University Campus), near Narranderra, and also further west along the Murray River (near Mathoura) and in Victoria.		absent from the Subject Land.	within the locality.	
<i>Austrostipa wakoolica</i> A Speargrass	E	E	Confined to the floodplains of the Murray River tributaries of central-western and south-western NSW, it grows in open woodland on grey, silty clay or sandy loam soils; habitats include the edges of a lignum swamp 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. Associated species include <i>Callitris glaucophylla</i> , <i>Eucalyptus microcarpa</i> , <i>E. populnea</i> , <i>Austrostipa eremophila</i> , <i>A. drummondii</i> , <i>Austrodanthonia eriantha</i> and <i>Einadia nutans</i> .	0	Marginal Potential habitat present due to silty clay soils and <i>Eucalyptus microcarpa</i> .	Possible Species unlikely to be present due to agricultural land-use activities.	Yes Presence assumed. An AoS has been undertaken.
<i>Brachyscome muelleroides</i> Mueller Daisy	V	V	Grows in damp areas on the margins of claypans in moist grassland with <i>Pycnosorus globosus</i> , <i>Agrostis avenacea</i> and <i>Austrodanthonia duttoniana</i> . Also recorded from the margins of lagoons in mud or water, and in association with <i>Calotis anthemoides</i> . Victorian collections have generally come from open positions on the Murray River floodplain, swampy River Red Gum (<i>Eucalyptus camaldulensis</i>) Forest and damp depressions. Occurs in the Wagga Wagga, Narranderra, Tocumwal and Walbundrie areas.	0 (PMST)	Absent Damp margins of claypans in moist grassland is absent from the Subject Land.	Unlikely Species unlikely to be present due to absence of habitat and no records within the locality.	No Absence of suitable habitat, records and unlikely to occur.

Scientific Name Common Name	Listing status		Habitat	No. of records within 10 km	Presence of habitat	Likelihood of occurrence	Potential impact
	BC Act	EPBC Act					
<i>Caladenia arenaria</i> Sand-hill Spider-orchid	E	E	Occurs in woodland with sandy soil, especially that dominated by White Cypress Pine (<i>Callitris glaucophylla</i>). Is found mostly on the south west plains and western south west slopes. The Sand-hill Spider Orchid is currently only known to occur in the Riverina between Urana and Narranderra.	0 (PMST)	Marginal Potential habitat present due to associated PCT.	Unlikely Marginal habitat present, however targeted surveys determined this species is absent.	No Absence of species from Subject Land.
<i>Caladenia concolor</i> Crimson Spider-orchid	E	V	The current NSW Scientific Committee listing incorporates two populations which have each been described as separate species. Other occurrences of the Crimson Spider Orchid in NSW are from the Nail Can Hill Crown Reserve near Albury. The species also occurs at two localities in Victoria near Beechworth and Chiltern. Habitat is regrowth woodland on granite ridge country that has retained a high diversity of plant species, including other orchids. The dominant trees are Blakely's Red Gum (<i>Eucalyptus blakelyi</i>), Red Stringybark (<i>E. macrorhyncha</i>), Red Box (<i>E. polyanthemos</i>) and White Box (<i>E. albens</i>); the diverse understorey includes Silver Wattle (<i>Acacia dealbata</i>), Hop Bitter-pea (<i>Daviesia latifolia</i>), Common Beard-heath (<i>Leucopogon virgatus</i>), Spreading Flax-lily (<i>Dianella revoluta</i>) and Poa Tussock (<i>Poa sieberiana</i>).	0 (PMST)	Absent Regrowth woodland on granite ridge country is absent from the Subject Land.	Unlikely Species unlikely to be present due to absence of habitat and no records within the locality.	No Absence of suitable habitat, records and unlikely to occur.

Scientific Name Common Name	Listing status		Habitat	No. of records within 10 km	Presence of habitat	Likelihood of occurrence	Potential impact
	BC Act	EPBC Act					
			This species is deciduous, producing a leaf during autumn or winter and after flowering in spring survives the dry summer and early autumn as a dormant tuber.				
<i>Euphrasia arguta</i> Eyebright	CE	CE	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. Previous habitat consisted of grassy rivers at elevations of up to 700 m above sea level with 600 mm of annual rainfall. Recently discovered populations have been found in grassy forests or regrowth vegetation. <i>Euphrasia arguta</i> has an annual habit and has been observed to die off over the winter months, with active growth and flowering occurring between January and April.	0	Marginal Potential habitat present in grassy areas.	Possible Species unlikely to be present due to agricultural land-use activities.	Yes Presence assumed. An AoS has been undertaken.
<i>Indigofera efoliata</i> Leafless Indigo	E	E	Appears to inhabit Yellow Box woodland and overlaps with <i>White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland</i>. Associated species include <i>Allocasuarina luehmannii</i>, <i>Exocarpos cupressiformis</i>, <i>Alectryon oleifolius</i>, <i>Geijera parviflora</i>, <i>Eucalyptus melliodora</i>, <i>Acacia deanei</i>, <i>A. buxifolia</i>, <i>A. hakeoides</i>, <i>A. spectabilis</i>, <i>A. lineata</i>, <i>A. oswaldii</i>, <i>Eremophila mitchellii</i>, <i>Myoporum platycarpum</i>, <i>Hakea leucoptera</i>, <i>Dodonaea viscosa</i>, <i>Apophyllum anomalum</i>, <i>Cassinia aculeata</i> and <i>Lissanthe strigosa</i>. Recorded in Goonoo State Forest in <i>Eucalyptus crebra</i> and <i>Callitris</i>	0	Marginal Potential habitat present due to associated TEC.	Unlikely Marginal habitat present, however targeted surveys determined	No Absence of species from Subject Land.

Scientific Name Common Name	Listing status		Habitat	No. of records within 10 km	Presence of habitat	Likelihood of occurrence	Potential impact
	BC Act	EPBC Act					
			<i>glaucophylla</i> dry sclerophyll forest, and in <i>Eucalyptus microcarpa</i> and <i>Callitris glaucophylla</i> tall woodland. Grows on slight rises amongst ironstone formation in stony red-brown sandy loam. Very rare and possibly now extinct, known only from a few collections in the Dubbo area.			this species is absent.	
<i>Prasophyllum petilum</i> Tarengo Leek Orchid	E	E	Natural populations are known from a total of five sites in NSW. These are near Boorowa, Queanbeyan area, Ilford, Delegate and a newly recognised population approximately 10 km west of Muswellbrook. It also occurs at Hall in the ACT. Grows in open sites within Natural Temperate Grassland at the Boorowa and Delegate sites. Also grows in grassy woodland in association with River Tussock (<i>Poa labillardierei</i>), Black Gum (<i>Eucalyptus aggregata</i>) and tea-trees (<i>Leptospermum</i> spp.) near Queanbeyan and within the grassy ground layer dominated by Kangaroo Grass under Box-Gum Woodland at Ilford (and Hall). Occurs on relatively fertile soils in grassy woodland or natural grassland. Occurs on flat or gently sloping sites on plains and rolling hills. Soils are usually loams, clay loams or sandy clays. Winters are cold, and summers mild to warm. Apparently highly susceptible to grazing, being retained only at little-grazed travelling stock reserves (Boorowa & Delegate) and in cemeteries (near Queanbeyan, Ilford and Hall).	0 (PMST)	Marginal Potential habitat present including presence of some characteristic species.	Possible Species unlikely to be present due to agricultural land-use activities.	Yes Presence assumed. An AoS has been undertaken.

Scientific Name Common Name	Listing status		Habitat	No. of records within 10 km	Presence of habitat	Likelihood of occurrence	Potential impact
	BC Act	EPBC Act					
			Plants retreat into subterranean tubers after fruiting, so are not visible above-ground outside of growing periods.				
<i>Prasophyllum validum</i> Sturdy Leek-orchid	Not Listed	V	Occurs across inland Victoria and in South Australia in the Flinders Ranges. Tends to grow in drier woodland habitats, generally with a low sparse understorey. In Victoria, it occurs in box and box-ironbark woodland with overstorey trees including <i>Eucalyptus polyanthemos</i> , <i>Eucalyptus albens</i> , <i>Eucalyptus macrorhyncha</i> , <i>Eucalyptus viminalis</i> and <i>Callitris glaucophylla</i> , and an open grassy to sparsely shrubby understorey including <i>Themeda triandra</i> , <i>Joycea pallida</i> , <i>Arthropodium strictum</i> , <i>Acacia verniciflua</i> , <i>Bursaria spinosa</i> , <i>Grevillea alpina</i> and <i>Grevillea dryophylla</i> . Soils vary from heavy clays to sandy loams.	0 (PMST)	Marginal Potential habitat present but Subject Land occurs outside of its known range.	Unlikely Marginal habitat present but is outside known distribution.	No Marginal habitat, outside distribution, lack of records in locality.
<i>Prasophyllum</i> sp. <i>Wybong</i> A Leek-orchid	Not Listed	CE	Its distribution is known from seven populations in open eucalypt woodland and grassland in New South Wales, with an estimated 1.5 km ² occupancy area. It is an endemic species to NSW, known from near Ilford, Premer, Muswellbrook, Wybong, Yeoval, Inverell, Tenterfield, Currabubula and the Pilliga area. The distribution of this species overlaps with <i>White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland</i> .	0	Marginal Potential habitat present in woodland and grassland areas.	Unlikely Marginal habitat present, however targeted surveys determined this species is absent.	No Absence of species from Subject Land.

Scientific Name Common Name	Listing status		Habitat	No. of records within 10 km	Presence of habitat	Likelihood of occurrence	Potential impact
	BC Act	EPBC Act					
<i>Senecio macrocarpus</i> Large-fruit Fireweed	Not Listed	V	The species is endemic to south-eastern Australia. The species has been more recently recorded in NSW. There are five known records of the species from east of Gundaroo in the South Eastern Highlands bioregion. Occurs in a variety of habitats including grasslands, sedgelands, shrublands and woodlands. Generally grows on sparsely vegetated sites on sandy loam to heavy clay soils, often in depressions that are waterlogged in winter. Seems to occur in areas where competition from other understorey plants is low. In NSW, it has been recorded near creeks in clay loam soils on shale, often in Yellow Box grassy open woodland with mixed shrubs and forbs.	0 (PMST)	Marginal Potential habitat present including Yellow Box grassy open woodland.	Unlikely Marginal habitat present but is outside known distribution.	No Marginal habitat, outside distribution, lack of records in locality.
<i>Swainsona recta</i> Small Purple-pea, Mountain Swainson-pea, Small Purple Pea	E	E	The species occurs within, and is a component of <i>White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland</i>. Occurs predominantly in grassy woodlands, but sometimes extends into grassy open-forest. Tree cover is usually dominated by Blakely's Red Gum (<i>Eucalyptus blakelyi</i>), Yellow Box (<i>E. melliodora</i>), Candlebark Gum (<i>E. rubida</i>) and Long-leaf Box (<i>E. gonicalyx</i>). Grows in association with understorey dominants that include Kangaroo Grass (<i>Themeda australis</i>), <i>Poa</i> tussocks (<i>Poa</i> spp.) and spear-grasses (<i>Austrostipa</i> spp.). Occurs on both red-brown loams and grey gritty or stony loams, generally on undulating terrain. It occurs on all aspects and has an altitudinal range from 180 m to 960 m above sea level.	0 (PMST)	Marginal Potential habitat present including presence of some characteristic species.	Unlikely Marginal habitat present, however targeted surveys determined this species is absent.	No Absence of species from Subject Land.

Scientific Name Common Name	Listing status		Habitat	No. of records within 10 km	Presence of habitat	Likelihood of occurrence	Potential impact
	BC Act	EPBC Act					
REPTILE							
<i>Aprasia parapulchella</i> Pink-tailed Worm-lizard, Pink-tailed Legless Lizard	V	V	Known from the Central and Southern Tablelands, and the South Western Slopes. A concentration of populations in the Canberra/Queanbeyan Region, Cooma, Yass, Bathurst, Albury and West Wyalong. Inhabits sloping, open woodland areas with predominantly native grassy groundlayers, particularly those dominated by Kangaroo Grass (<i>Themeda triandra</i>). Sites are typically well-drained, with rocky outcrops or scattered, partially-buried rocks. Commonly found beneath small, partially-embedded rocks and appear to spend considerable time in burrows below these rocks; the burrows have been constructed by and are often still inhabited by small black ants and termites. Feeds on the larvae and eggs of the ants with which it shares its burrows.	0 (PMST)	Marginal Potential habitat present including open woodland with predominately native grassy groundlayers.	Unlikely Marginal habitat present, however an expert report determined this species is absent.	No Absence of species from Subject Land.
<i>Delma impar</i> Striped Legless Lizard, Striped Snake-lizard	V	V	Known to occur in <i>White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland</i>. This species is a grassland specialist found only in areas of native grassland, nearby grassy woodland and exotic pasture. Found mainly in Natural Temperate Grassland but has also been captured in grasslands that have a high exotic component. Habitat is where grassland is dominated by perennial, tussock-forming grasses such as Kangaroo Grass (<i>Themeda triandra</i>), Spear-grasses (<i>Austrostipa spp.</i>), Poa tussocks (<i>Poa spp.</i>), and occasionally Wallaby Grasses (<i>Austrodanthonia spp.</i>). Sometimes present in	0 (PMST)	Present Suitable habitat including TEC, grassland, grassy woodland	Possible Species may occur within the Subject Land due to presence of habitat.	Yes Presence assumed. Mitigation measures have been addressed in the BDAR. An AoS has

Scientific Name Common Name	Listing status		Habitat	No. of records within 10 km	Presence of habitat	Likelihood of occurrence	Potential impact
	BC Act	EPBC Act					
			modified grasslands with a significant content of exotic grasses, and in grasslands with significant amounts of surface rocks used for shelter. Sometimes utilises dried cowpats for shelter. Actively hunts for spiders, crickets, moth larvae and cockroaches.		and exotic pasture.		been undertaken.

C.8 Protected Matters Search Report



Australian Government

Department of Climate Change, Energy,
the Environment and Water

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 07-Apr-2025

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	4
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	41
Listed Migratory Species:	8

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	2
Commonwealth Heritage Places:	None
Listed Marine Species:	16
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	2
Regional Forest Agreements:	1
Nationally Important Wetlands:	None
EPBC Act Referrals:	4
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands)		[Resource Information]
Ramsar Site Name	Proximity	Buffer Status
Banrock station wetland complex	600 - 700km upstream from Ramsar site	In feature area
Hattah-kulkyne lakes	400 - 500km upstream from Ramsar site	In feature area
Riverland	500 - 600km upstream from Ramsar site	In feature area
The coorong, and lakes alexandrina and albert wetland	600 - 700km upstream from Ramsar site	In feature area

Listed Threatened Ecological Communities	[Resource Information]
For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps. Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.	

Community Name	Threatened Category	Presence Text	Buffer Status
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Endangered	Community likely to occur within area	In feature area
Weeping Myall Woodlands	Endangered	Community may occur within area	In feature area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area	In feature area

Listed Threatened Species			[<u>Resource Information</u>]
Status of Conservation Dependent and Extinct are not MNES under the EPBC Act. Number is the current name ID.			
Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat known to occur within area	In feature area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat may occur within area	In feature area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat known to occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat known to occur within area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Pedionomus torquatus Plains-wanderer [906]	Critically Endangered	Species or species habitat may occur within area	In feature area
Polytelis swainsonii Superb Parrot [738]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area	In feature area
CRUSTACEAN			
Euastacus armatus Murray Crayfish [81537]	Vulnerable	Species or species habitat may occur within area	In feature area
FISH			
Galaxias rostratus Flathead Galaxias, Beaked Minnow, Flat-headed Galaxias, Flat-headed Jollytail, Flat-headed Minnow [84745]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
Macquaria australasica Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
FROG			
Crinia sloanei Sloane's Froglet [59151]	Endangered	Species or species habitat likely to occur within area	In feature area
Litoria raniformis Southern Bell Frog, Growling Grass Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat may occur within area	In feature area
INSECT			
Keyacris scurra Key's Matchstick Grasshopper [89739]	Endangered	Species or species habitat may occur within area	In buffer area only
Synemon plana Golden Sun Moth [25234]	Vulnerable	Species or species habitat may occur within area	In buffer area only
MAMMAL			
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area	In feature area
Nyctophilus corbeni Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat may occur within area	In feature area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat likely to occur within area	In feature area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
PLANT			
Ammobium craspedioides Yass Daisy [20758]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Amphibromus fluitans River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Brachyscome muelleroides Mueller Daisy [15572]	Vulnerable	Species or species habitat may occur within area	In feature area
Caladenia arenaria Sand-hill Spider-orchid [9275]	Endangered	Species or species habitat may occur within area	In buffer area only
Caladenia concolor Crimson Spider-orchid, Maroon Spider-orchid [5505]	Vulnerable	Species or species habitat may occur within area	In feature area
Prasophyllum petilum Tarengo Leek Orchid [55144]	Endangered	Species or species habitat may occur within area	In feature area
Prasophyllum validum Sturdy Leek-orchid, Mount Remarkable Leek-orchid [10268]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Senecio macrocarpus Large-fruit Fireweed, Large-fruit Groundsel [16333]	Vulnerable	Species or species habitat may occur within area	In feature area
Swainsona recta Small Purple-pea, Mountain Swainson-pea, Small Purple Pea [7580]	Endangered	Species or species habitat may occur within area	In buffer area only
REPTILE			
Aprasia parapulchella Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Delma impar Striped Legless Lizard, Striped Snake-lizard [1649]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Listed Migratory Species		[Resource Information]	
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Other Matters Protected by the EPBC Act

Commonwealth Lands		[Resource Information]
The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.		
Commonwealth Land Name	State	Buffer Status
Communications, Information Technology and the Arts - Telstra Corporation Limited		
Commonwealth Land - Australian Telecommunications Commission [14720]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [16191]	NSW	In buffer area only

Listed Marine Species	[Resource Information]		
Scientific Name	Threatened Category	Presence Text	Buffer Status

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Livingstone	State Conservation Area	NSW	In buffer area only
Livingstone	National Park	NSW	In buffer area only

Regional Forest Agreements	[Resource Information]
Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.	

RFA Name	State	Buffer Status
Southern RFA	New South Wales	In feature area

EPBC Act Referrals					[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status	
Not controlled action					
Albury to Illabo Section of Inland Rail	2020/8670	Not Controlled Action	Completed	In feature area	
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area	
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area	
Not controlled action (particular manner)					
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area	

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data is available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on the contents of this report.

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions when time permits.

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded breeding sites; and
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- [-Natural history museums of Australia](#)
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- [-Other groups and individuals](#)

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

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C.9 DCCEEW Referral Decision



Australian Government

Department of Climate Change, Energy,
the Environment and Water

EPBC 2025/10220

Mr Stephan Mitchell
Development Manager
Samsung C&T Renewable Energy Australia Pty Ltd

Stephan.mit@samsung.com

Decision on referral for Mangoplah BESS, Mangoplah, NSW

Dear Mr Mitchell

Thank you for referring a proposed action under section 68 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This is to advise you of my decision about the proposed action to construct, operate and decommission a Battery Energy Storage System and associated infrastructure in Mangoplah, New South Wales.

As a delegate of the Minister for the Environment and Water, I have decided that the proposed action is not a controlled action. This means that the proposed action does not require further assessment and approval under the EPBC Act before it can proceed. A copy of the document recording this decision is attached. This document will be published on the department's website.

Please note that this decision relates only to the specific matters protected under Chapter 2 of the EPBC Act. This decision does not affect any requirement for separate State or local government environment assessment and approvals of the proposed action.

If you have any questions about the referral process or this decision, please contact the project manager, Bec Gray, by email to Bec.Gray1@dcceew.gov.au, and quote the EPBC reference number shown at the beginning of this letter.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Kate Gowland'.

Kate Gowland
Branch Head
Environment Assessments NSW and ACT

25 July 2025



Australian Government

Department of Climate Change, Energy,
the Environment and Water

Notification of referral decision – not controlled action

Mangoplah BESS (EPBC 2025/10220)

This decision is made under section 75 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Proposed Action

person proposing to take the Action	Samsung C&T Renewable Energy Australia Pty Ltd ABN: 74 661 046 331
proposed Action	To construct, operate and decommission a Battery Energy Storage System and associated infrastructure in Mangoplah, New South Wales (See EPBC Act referral 2025/10220).

Referral decision: not a controlled action

status of proposed Action	The proposed Action is not a controlled action.
----------------------------------	---

Person authorised to make decision

name and position	Kate Gowland Branch Head Environment Assessments (NSW, ACT)
signature	
date of decision	25 July 2025

Appendix D Survey data

D.1 Vegetation integrity plot data

Table 13-2 Vegetation survey data and locations

4	3	2	1	plot
76	277	0 - Exotic	277	pct
0.15	0.22	18.95	0.13	area
25-100ha	25-100ha	n/a	>100ha	patchsize
Low	Good	n/a	Moderate	condition class
55	55	55	55	zone
524131.0	524002	525557	525572	easting
6082144.	6082163	6083561	6083530	northing
61	94.70323	45.07920	15.71187	bearing
0.0	2.0	0.0	3.0	compTree
0.0	0.0	0.0	0.0	compShrub
8.0	5.0	1.0	1.0	compGrass
3.0	4.0	1.0	2.0	compForbs
0.0	0.0	0.0	0.0	compFerns
0.0	0.0	0.0	0.0	compOther
0.0	15.0	0.0	20.1	strucTree
0.0	0.0	0.0	0.0	strucShrub
70.8	31.4	0.1	0.1	strucGrass
0.3	0.4	0.1	0.2	strucForbs
0.0	0.0	0.0	0.0	strucFerns
0.0	0.0	0.0	0.0	strucOther
0	2	0	5	funLargeTrees
0	2	0	5	funHollowtrees
23.0	1.8	4.8	4.2	funLitterCover
0.0	4.0	3.0	29.0	funLenFallenLogs
0	1	0	0	funTreeStem5to9
0	0	0	0	funTreeStem10to19
0	0	0	0	funTreeStem20to29
0	0	0	0	funTreeStem30to49
0	1	0	1	funTreeStem50to79
0	1	0	0	funTreeRegen
2.3	30.1	0.1	0.0	funHighThreatExotic
☒ Yes ☐ No	☒ Yes ☐ No	☒ Yes ☐ No	☒ Yes ☐ No	Plot-based vegetation survey?
☒ Yes ☐ No	☒ Yes ☐ No	☒ Yes ☐ No	☒ Yes ☐ No	Vegetation integrity survey?

8	7	6	5	plot
277	277	277	76	pct
1.50	0.13	1.50	0.15	area
25-100ha	>100ha	25-100ha	25-100ha	patchsize
Low	Moderate	Low	Low	condition class
55	55	55	55	zone
525412.5	525336.6	524896.2	524619.4	easting
6082174.	6082098.	6082130.	6082144.	northing
163	55	95	81	bearing
0.0	1.0	1.0	0.0	compTree
0.0	0.0	0.0	0.0	compShrub
9.0	5.0	9.0	7.0	compGrass
5.0	2.0	5.0	7.0	compForbs
0.0	0.0	0.0	0.0	compFerns
0.0	0.0	0.0	0.0	compOther
0.0	30.0	0.1	0.0	strucTree
0.0	0.0	0.0	0.0	strucShrub
61.6	0.9	44.5	60.2	strucGrass
0.5	25.1	0.5	0.8	strucForbs
0.0	0.0	0.0	0.0	strucFerns
0.0	0.0	0.0	0.0	strucOther
0	6	0	0	funLargeTrees
0	2	0	0	funHollowtrees
29.6	33.0	13.4	18.4	funLitterCover
0.0	30.0	0.0	0.0	funLenFallenLogs
0	0	0	0	funTreeStem5to9
0	0	0	0	funTreeStem10to19
0	0	0	0	funTreeStem20to29
0	1	0	0	funTreeStem30to49
0	1	0	0	funTreeStem50to79
0	0	1	1	funTreeRegen
0.2	4.0	25.3	0.2	funHighThreatExotic
☒ Yes ☐ No	☒ Yes ☐ No	☒ Yes ☐ No	☒ Yes ☐ No	Plot-based vegetation survey?
☒ Yes ☐ No	☒ Yes ☐ No	☒ Yes ☐ No	☒ Yes ☐ No	Vegetation integrity survey?

BAM Site Field Survey (All orange cells are for data entry, please do not edit other cells or work sheets as they contain formulas)									
Project number:	240779	Plot Identifier:	4	Pic 20x20 Head (ID#)	01_115508_11860401	Pic 20x50 Tail (ID#)	01_122015_1343770133143079934		
Survey date: (01/01/2021)	1/04/2025	Recorders (full name):	Julie Gooding, Michael Cleland	PCT:	76	Compass Orientation (head of 20x20 plot):	61 degrees NE		
GPS Easting:	524131.0365	GPS Northing:	6082144.631	Datum (GDA)	2020	Veg Zone condition (low, mod, high):	Low	Zone (54/55/56)	55
Site location description (eg 2km west of Hay along Mid Western Highway)				Derived Grassland, alongside farm access track, off Holbrook Road, 3km South of Mangoplah					
Landform				Soils		Drainage & Slope			
Morphology				Soil Texture	clay loam		Slope	none	
LandF Element				Soil Colour	grey brown		Aspect		
LandF Pattern				Soil Depth			Drainage		
Microrelief				Geology			Watercourses		
Plot Disturbance									
	Severity	Age	Observational Evidence						
Clearing	2	R	Chopped trees						
Cultivation	1	NR							
Soil erosion	1								
Firewood	2	R	Removed fallen timber						
Grazing	2	R	Cow pats, cow pugging, Cows						
Fire Damage	0								
Storm Damage	0								
Weediness	1	R	Paspalum, Phalaris, St Johns Wort						
Other									
Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)									
Additional information									
Current land use									
Access track - grazing.									
Age class of trees (DBH), condition of vegetation, hollows									
none									
Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)									
Grazing									
Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)									
Box-Gum Woodland									
Dominant Species outside Plot									
Grey Box, Blakely's Red Gum									

FUNCTION

Function attributes for			4						
BAM Attribute (20x20m plot)				BAM Attributes (1 x 1m Plots)					
Count of Native Richness	Stratum	Sum		Litter Cover	Tape length	% cover	Average %	Photo ID #	
	Tree (TG)	0			5m	15%	23.0%		
	Shrub (SG)	0			15m	20%			
	Forb (FG)	3			25m	25%			
	Grass & grasslike (GG)	8		Bare ground cover	35m	35%	10.8%		
	Fern (EG)	0			45m	20%			
	Other (OG)	0			5m	7%			
	TOTAL	11			15m	15%			
BAM Attribute (20x20m plot)				Cryptogam cover	25m	10%	0.0%		
Count of cover abundance (<u>native</u> vascular plants)	Stratum	Sum			35m	7%			
	Tree (TG)	0			45m	15%			
	Shrub (SG)	0			5m	0%			
	Forb (FG)	0.3			15m	0%			
	Grass & grasslike (GG)	70.8		Rock Cover	25m	0%	0.0%		
	Fern (EG)	0			35m	0%			
	Other (OG)	0			45m	0%			
	TOTAL Native	71.1			5m	0%			
TOTAL 'HTE'	2.3		15m		0%				
BAM Attribute (20 x 50m plot) Tree Stem Counts									
DBH (cm)	Euc	Non Euc	Hollows						
>80	0	0							
50-79	0	0							
30-49	0	0							
20-29	0	0							
10-19	0	0							
5-9	0	0							
<5	0	0	N/A						
Length of logs (m)		0							
				Total Cover (>100%)					
				Native cover					
				Exotic cover					
				Other Ground Cover					
				0.1% 63 x 63cm					
				0.5% 1.4 x 1.4m					
				1.0% 2 x 2m					
				5.0% 4 x 5m					
				25.0% 10 x 10m					

COMPOSITION & STRUCTURE

Species recorded for									
Genus	Species	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?
Chloris	truncata	<i>Chloris truncata</i>	Windmill Grass	Poaceae	10	400		0 Grass & grasslike	No
Cynodon	dactylon	<i>Cynodon dactylon</i>	Common Couch	Poaceae	35	1000		0 Grass & grasslike	No
Bothriochloa	macra	<i>Bothriochloa macra</i>	Red Grass	Poaceae	25	600		0 Grass & grasslike	No
Eragrostis	elongata	<i>Eragrostis elongata</i>	Clustered Lovegrass	Poaceae	0.1	30		0 Grass & grasslike	No
Hypochaeris	radicata	<i>Hypochaeris radicata</i>	Catsear	Asteraceae	0.2	300	*		No
Panicum	capillare	<i>Panicum capillare</i>	Witchgrass	Poaceae	0.1	30	*		No
Eragrostis	leptostachya	<i>Eragrostis leptostachya</i>	Paddock Lovegrass	Poaceae	0.1	60		0 Grass & grasslike	No
Romulea	rosea var. australis	<i>Romulea rosea var. australis</i>	Onion Grass	Iridaceae	0.1	20	*		HTE
Conyza	bonariensis	<i>Conyza bonariensis</i>	Flaxleaf Fleabane	Asteraceae	0.1	5	*		No
Chamaesyce	drummondii	<i>Chamaesyce drummondii</i>	Caustic Weed	Euphorbiaceae	0.1	30		0 Forb (FG)	No
Elymus	scaber	<i>Elymus scaber</i>	Common Wheatgrass	Poaceae	0.2	100		0 Grass & grasslike	No
Phalaris	aquatica	<i>Phalaris aquatica</i>	Phalaris	Poaceae	2	100	*		No
Rytidosperma	setaceum	<i>Rytidosperma setaceum</i>	Small-flowered Wallaby	Poaceae	0.2	200		0 Grass & grasslike	No
Setaria	spp.	<i>Setaria spp.</i>	Pigeon Grass	Poaceae	0.1	20	*		No
Paspalum	dilatatum	<i>Paspalum dilatatum</i>	Paspalum	Poaceae	2	100	*		HTE
Oxalis	perennans	<i>Oxalis perennans</i>		Oxalidaceae	0.1	1		0 Forb (FG)	No
Bromus	spp. (dead)	<i>Bromus spp.</i>		Poaceae	0.1	5	*		No
Conyza	canadensis var. canadensis	<i>Conyza canadensis var. canadensis</i>	Canadian Fleabane	Asteraceae	0.1	3	*	Forb (FG)	No
Hypericum	perforatum	<i>Hypericum perforatum</i>	St. Johns Wort	Clusiaceae	0.1	20	*		HTE
Eragrostis	curvula	<i>Eragrostis curvula</i>	African Lovegrass	Poaceae	0.1	1	*		HTE
Juncus	sp. (subsecundus?)	<i>Juncus subsecundus</i>	Finger Rush	Juncaceae	0.2	4		0 Grass & grasslike	No
Kickxia	elatine	<i>Kickxia elatine</i>	Pointed Toadflax	Scrophulariaceae	0.1	2	*		No

BAM Site Field Survey									
(All orange cells are for data entry, please do not edit other cells or work sheets as they contain formulas)									
Project number:	240779	Plot Identifier:	7	Pic 20x20 Head (ID#)	01_145420_52949554	Pic 20x50 Tail (ID#)	01_151442_5555905789610662003		
Survey date: (01/01/2021)	1/04/2025				Compass Orientation (head of 20x20 plot):		55 degrees NE		
Recorders (full name):	Julie Gooding, Michael Cleland	PCT:	6082098.127	277	Veg Zone condition (low, mod, high):		Moderate		
GPS Easting:	525336.6872	GPS Northing:			Datum (GDA)	2020	Zone (54/55/56)		55
Site location description (eg 2km west of Hay along Mid Western Highway)			Woodland, alongside farm access track, off Holbrook Road, 3km South of Mangoplah						
Landform			Soils			Drainage & Slope			
Morphology	hillslope				Soil Texture	clay loam	Slope		none
LandF Element					Soil Colour	grey brown	Aspect		
LandF Pattern					Soil Depth		Drainage		
Microrelief					Geology		Watercourses		
Plot Disturbance									
	Severity	Age	Observational Evidence						
Clearing	2	NR							
Cultivation	1		Adjacent to crop						
Soil erosion	1								
Firewood	1	R							
Grazing	3	R	Heavily disturbed understorey						
Fire Damage	0								
Storm Damage	0								
Weediness	3	R	Bathurst Burr						
Other									
Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)									
Additional information									
Current land use									
Agriculture									
Age class of trees (DBH), condition of vegetation, hollows									
30 - 80cm DBH									
Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)									
Grazing/Machinery									
Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)									
Box-Gum Woodland									
Dominant Species outside Plot		Yellow Box/Blakely's Red Gum							

D.2 VI plot photos

Please see overleaf.

Plot 1



Head of plot



5 m



15 m



25 m



35 m



45 m



End of plot

Plot 2



Head of plot



5 m



15 m



25 m



35 m



45 m



End of plot

Plot 3



Head of plot



5 m



15 m



25 m



35 m



45 m



End of plot

Plot 4



Head of plot



5 m



15 m



25 m



35 m



45 m



End of plot

Plot 5



Head of plot



5 m



15 m



25 m



35 m



45 m



End of plot

Plot 6



Head of plot



5 m



15 m



25 m



35 m



45 m



End of plot

Plot 7



Head of plot



5 m



15 m



25 m



35 m



45 m



End of plot

Plot 8



Head of plot



5 m



15 m



25 m



Photo N/A

35 m

45 m



End of plot

D.3 Anabat survey results

Please see overleaf.

Holbrook Rd, Mangolah, NSW – Biodiversity Development Assessment Report

Microbat Ultrasonic Call Identification Report

NGH Consulting

A report prepared for Maddie Robertson, Ecologist

Prepared by RA Environmental Consultants

ABN – 63 6685 875 27



Holbrook Rd, Mangolah, NSW – Biodiversity Development Assessment Report

Microbat Ultrasonic Call Identification Report

NGH Consulting

A report prepared for Maddie Robertson, Ecologist

Project aim

The collection of microbat ultrasonic call data and the preparation of this microbat call identification report were undertaken to determine which microbat species are present, or potentially present, at Holbrook Rd, Mangolah, NSW (hereafter, the subject land). The results of this assessment will inform a Biodiversity Development Assessment Report (BDAR).

Subject land and survey effort.

The subject land is located approximately 30 km south of Wagga Wagga, NSW. The data received for analysis was collected between 19 and 25 March 2025. The data was collected on five Anabat Swift detectors (Titley Scientific) programmed and passively deployed by NGH Consulting Pty Ltd (NGH). Each detector was set to record ultrasonic call data across the entire night (e.g., recording commenced at dusk and concluded at dawn). The submitted data was collected across 25 survey nights (Table 1). The detectors used, dates surveyed, overall survey effort, and the number of Waveform File Format (WAV) (full spectrum) files submitted for analysis are described in Table 1.

Table 1. The Anabat Swift detectors used to conduct the survey, nights surveyed, survey effort, and the number of files submitted for analysis.

Anabat detector	Detector reference number	Nights surveyed	Survey nights	WAV files submitted for analysis
Anabat 4-8-20	605425	19, 20, 21, 22, and 23 March 2025	5	2,654
Anabat 6	576053	19, 20, 21, 22, and 23 March 2025	5	8,922
Anabat 622822	622822	19, 20, 21, 22, and 23 March 2025	5	5,003
Anabat 622925	622925	20, 21, 22, 23, and 24 March 2025	5	3,585
Anabat 634-3-11-22	450034	19, 20, 21, 22, and 23 March 2025	5	18,238
Total			25	38,402

Preparation of a candidate species list

Before analysing the submitted microbat call data, a candidate list of microbat species known to or deemed likely to occur in the region (in this instance, ‘region’ acquaints to a 30 km radius from the subject land) was prepared by completing a search and a review of the Australian Bat Society ‘Bat Maps’ ([BatMap - Ausbats](#)), NSW Bionet database search tool, NSW threatened species profile web-pages, Atlas of Living Australia ([Atlas of Living Australia – Open access to Australia’s biodiversity data \(ala.org.au\)](#)), Churchill (2008), Pennay *et al.* (2011) and Baker and Gynther (2023) (Appendix 1). The database research and literature review identified 16 microbat species that are known to or are likely to occur in the region (Appendix 1 and Appendix 2).

Data analysis – preparing a species list

A total of 38,402 WAV files were submitted for analysis (Table 1). To prepare a species list, the 38,402 WAV files were subjected to a noise removal filter provided by the software program

Anabat Insight (Version 2.1.4-0-g1d3cd82 (Titley Scientific)). During this process, 10,371 noise-only files were excluded. A subset of the excluded files was manually checked to ensure that microbat bats had not been overlooked.

The 28,031 files passed by the noise filter were then subjected to a Decision Tree (DT) analysis to:

- Sort the microbat call sequences into groups based upon 5 to 10 kHz increments in the average characteristic frequency (Fc).
- Attach a label to each call sequence that best represents a species or a species complex that could be responsible for the call.

The sorted and labelled call sequences were verified manually in Anabat Insight. The species identifications were confirmed by comparing the Fc and pulse characteristics of each call sequence to the published call parameters presented in:

- The *Region based guide to the echolocation calls of microbats in New South Wales* (Pennay *et al.* 2004) ([Bat calls of New South Wales: Region based guide to the echolocation calls of Microchiropteran bats \(nsw.gov.au\)](#)) and an accompanying reference library of microbat call sequences that were collected from the Far West and Riverina bioregions ([Bat calls of NSW | NSW Environment and Heritage](#)).
- The *Key to the bat calls of south-east Queensland and north-east New South Wales* (Reinhold *et al.* 2001) ([\(1\) \(PDF\) Key to the bat calls of south-east Queensland and north-east New South Wales \(researchgate.net\)](#)).

While reviewing the microbat calls, the following protocols (adapted from Lloyd *et al.* 2006) were applied:

- Recorded calls with less than three pulses were generally excluded from the analysis as they can often be too short to confidently determine the identity of the species making the call (Law *et al.* 1999). These short sequences were removed from the data during the DT analysis or as the data was manually reviewed.
- For those calls that can be used to identify a microbat species (or a species complex), two categories of confidence were used (Mills *et al.* 1996):
 - Present – the Fc, quality, and structure of the call sequence features (e.g., pulse characteristics) (as per Pennay *et al.* 2004) are such that the identity of the microbat species making the call can be resolved with a high degree of confidence.
 - Potentially present – the quality and structure of the call sequence are such that there is a degree of uncertainty about the identity of the species making the call. Or there is some likelihood of confusion with another species that produces a similar (overlapping) call sequence. Therefore, resolving or attributing that call sequence to a single microbat species can be impossible.
- Unusual call sequences (e.g., possible social calls, intra- and inter-species interaction calls, excited calls, or feeding buzzes) that cannot be used to identify a microbat species were labeled as ‘low’ quality or dismissed from the analysis.
- Sequences that cannot be attributed to an echolocating microbat (e.g., insect noise, wind, train, and vehicle movements) were dismissed from the analysis.

Results and Discussion

Summary

Ten microbat species were positively identified (Table 2 - Table 3). A further six species were determined to be potentially present in the subject land (Table 2 – Table 3). Examples of the call sequences recorded during this survey are displayed in Figures 1- 16.

Threatened species information.

Two threatened microbats listed as Vulnerable under the *Biodiversity Act 2016* (BC Act) were determined to be present in the subject land (Table 2 and Table 3). The two threatened species deemed to be present include:

- *Miniopterus orianae oceanensis* (Large Bent-winged Bat)
- *Myotis macropus* (Southern Myotis)

Two further microbat species that are also listed as Vulnerable under the BC Act were determined to be potentially present in the subject land (Table 2 and Table 3). The two threatened species deemed to be potentially present include:

- *Nyctophilus corbeni* (Corben's Long-eared Bat)
- *Saccolaimus flaviventris* (Yellow-bellied Sheath-tailed Bat)

Table 2. Microbat species recorded during the Mangoplah survey.

Species name	Common name	Conservation status		Present / potentially present
		BC Act 2016	EPBC Act 1999	
<i>Austronomus australis</i>	White-striped Free-tailed Bat			Present
<i>Chalinolobus gouldii</i>	Gould's Wattled Bat			Present
<i>Chalinolobus morio</i>	Chocolate Wattled Bat			Present
<i>Miniopterus orianae oceanensis</i>	Large Bent-winged Bat	Vulnerable		Present
<i>Myotis macropus</i>	Southern Myotis	Vulnerable		Present
<i>Nyctophilus corbeni</i>	Corben's Long-eared Bat	Vulnerable	Vulnerable	Potentially present
<i>Nyctophilus geoffroyi</i>	Lesser Long-eared Bat			Potentially present
<i>Nyctophilus gouldi</i>	Gould's Long-eared Bat			Potentially present
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tailed Bat	Vulnerable		Potentially present
<i>Scotorepens balstoni</i>	Inland Broad-nosed Bat			Present
<i>Scotorepens greyii</i>	Little Broad-nosed Bat			Potentially present
<i>Ozimops planiceps</i>	Southern Free-tailed Bat			Present
<i>Ozimops ridei</i>	Ride's Free-tailed Bat			Present
<i>Vespadelus darlingtoni</i>	Large Forest Bat			Present
<i>Vespadelus regulus</i>	Southern Forest Bat			Potentially present
<i>Vespadelus vulturnus</i>	Little Forest Bat			Present

Table 3. Microbat species recorded at each survey site.

Species name	Common name	Anabat detector				
		Anabat 4-8-20	Anabat 6	Anabat 622822	Anabat 622925	Anabat 634-3-11-22
<i>Austronomus australis</i>	White-striped Free-tailed Bat	Present	Present	Present	Present	Present
<i>Chalinolobus gouldii</i>	Goulds Wattled Bat	Present	Present	Present	Present	Present
<i>Chalinolobus morio</i>	Chocolate Wattled Bat	Present	Present	Present	Present	Present
<i>Miniopterus orianae oceanensis</i> *	Large Bent-winged Bat	Present	Present	Present	Present	Potentially present
<i>Myotis macropus</i> *	Southern Myotis	Present	Present	Potentially present	Present	Potentially present
<i>Nyctophilus corbeni</i> * and 1	Corben's Long-eared Bat	Potentially present	Potentially present	Potentially present	Potentially present	Potentially present
<i>Nyctophilus geoffroyi</i>	Lesser Long-eared Bat	Potentially present	Potentially present	Potentially present	Potentially present	Potentially present
<i>Nyctophilus gouldi</i>	Gould's Long-eared Bat	Potentially present	Potentially present	Potentially present	Potentially present	Potentially present
<i>Saccolaimus flaviventris</i> *	Yellow-bellied Sheath-tailed Bat	Potentially present	Potentially present	Potentially present	Potentially present	Potentially present
<i>Scotorepens balstoni</i>	Inland Broad-nosed Bat	Present	Present	Present	Present	Potentially present
<i>Scotorepens greyii</i>	Little Broad-nosed Bat	Potentially present	Not detected	Potentially present	Present	Potentially present
<i>Ozimops planiceps</i>	Southern Free-tailed Bat	Present	Present	Present	Present	Present

Species name	Common name	Anabat detector				
		Anabat 4-8-20	Anabat 6	Anabat 622822	Anabat 622925	Anabat 634-3-11-22
<i>Ozimops ridei</i>	Ride's Free-tailed Bat	Present	Present	Potentially present	Present	Present
<i>Vespadelus darlingtoni</i>	Large Forest Bat	Present	Present	Present	Present	Present
<i>Vespadelus regulus</i>	Southern Forest Bat	Not detected	Not detected	Potentially present	Not detected	Not detected
<i>Vespadelus vulturnus</i>	Little Forest Bat	Present	Present	Present	Present	Present

*Represents those species listed as Vulnerable under the BC Act, and 1 represents those species listed as Vulnerable under the EPBC Act

Unresolved call sequences and survey limitations

A microbat species was deemed present when the recorded call characteristics matched those described in Pennay *et al.* (2004). In the Riverina bioregion of NSW, several species can have overlapping call sequences (Pennay *et al.* 2004). These overlapping call sequences can have a similar Fc range and often identical pulse characteristics, thus making it difficult or impossible to resolve a microbat call sequence to a single species. If an overlap has been deemed to occur, that call sequence will be considered ‘unresolved,’ and given a multi-species complex label, and in some cases, those species in that complex will then be determined to be ‘potentially present’ only. The following are examples of those species recorded during this survey that can have overlapping call sequences.

- The higher-intensity call sequences of the White-striped Free-tailed Bat could overlap with those of the threatened Yellow-bellied Sheath-tailed Bat. See Figure 1 and Figure 2 for examples of the resolved and unresolved call sequences for these two species.
- The call sequences of the non-threatened *Chalinolobus gouldii* (Gould’s Wattled Bat), *Ozimops planiceps* (Southern Free-tailed Bat), and *O. ridei* (Ride’s Free-tailed Bat) can overlap. See Figure 3, Figure 10, Figure 11, and Figure 12 for examples of the resolved call sequences for these species.
- The call sequence of the Chocolate Wattled Bat can overlap with the call sequences of the *Vespadelus regulus* (Eastern Forest Bat), and *V. vulturinus* (Little Forest Bat). See Figure 4, Figure 15, and Figure 16 for examples of the resolved and unresolved call sequences for these species.
- In this region of NSW, the call sequences of the threatened Large Bent-winged Bat *V. darlingtoni* (Large Forest Bat) and *V. vulturinus* (Little Forest Bat) can overlap. See Figure

5, Figure 6, Figure 14, and Figure 16 for examples of a resolved and unresolved call sequence for these species.

- The call sequences of the threatened Southern Myotis and Corben's Long-eared Bat and the non-threatened *N. geoffroyi* (Lesser Long-eared Bat) and *N. gouldi* (Gould's Long-eared Bat) can overlap. See Figure 7, Figure 8, and Figure 9 for examples of a resolved and unresolved call sequence for these species.
- The call sequence of the Southern Forest Bat and the Little Forest Bat can overlap. See Figure 14 and Figure 16 for examples of an unresolved call sequence for these species.

Further surveys would be required to confirm the presence of the species deemed to be potentially present within the subject land. The DPIE (2021) '*Species credit' threatened bats and their habitats* guide suggests that these further surveys could involve:

- The deployment of mist or harp traps to conduct live capture and release surveys.
- The use of thermal or infrared cameras in conjunction with a hand-held microbat call detector to monitor forage (e.g., flight location and/or patterns, dipping/raking across the surface of a water body by Southern Myotis) and roost emergence activity.
- A search of any potential roost sites (e.g., natural caves, disused mines, bridge structures, stormwater drains or culverts, tree hollows, or under-exfoliating bark) for:
 - The presence of roosting microbats.
 - Indirect evidence of roosting microbats in the form of urine staining, guano, fur, carcasses (dead microbats), and bat fly (e.g., Superfamily: Hippoboscoidea, Family: Nycteribiidae and Streblidae) pupae casings.

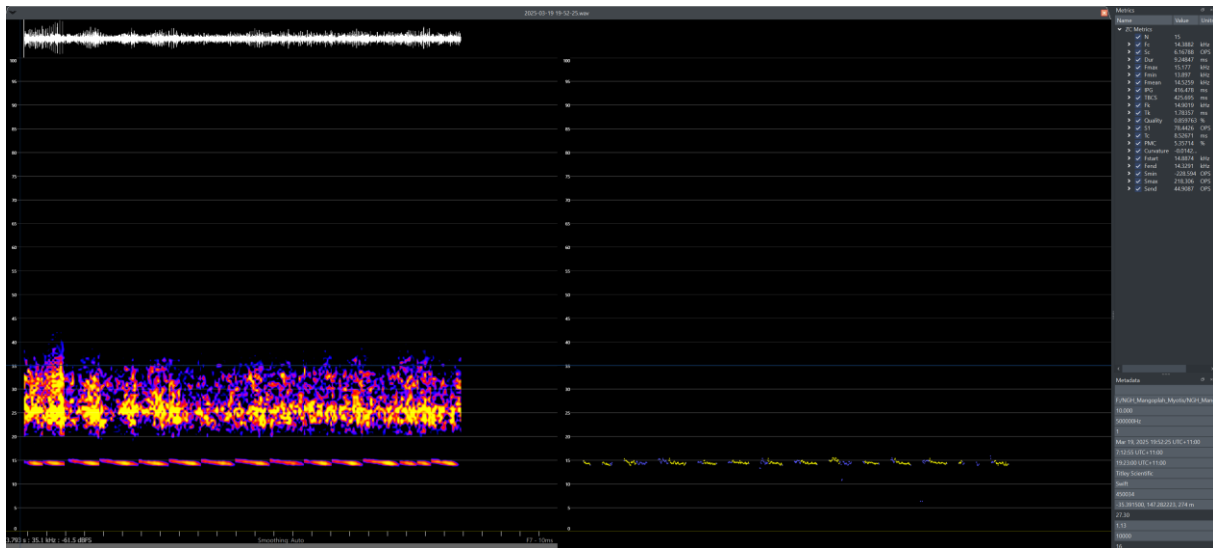
Reporting and nomenclature

This microbat bat call identification report follows the recommended reporting requirements provided by the Australian Bat Society (Reardon 2003). Microbat species and common names follow Armstrong *et al.* (2020). However, in this report, Large Bent-winged Bat is the common name applied to *Miniopterus orianae oceanensis*.

Disclaimer

The statements made in this report are to inform a BDAR that is to be prepared by NGH Consulting. RA Environmental Consultants will not be liable for any loss or damage that might arise from the use of this report by any third party. RA Environmental Consultants, if required, reserves the right to re-analysis, review, and/or discuss the labeling and identification of the species identified in this assessment.

Examples of the resolved and unresolved microbat call sequences recorded during this survey. The call sequences are displayed in full spectrum (left-hand side) and zero crossing file (right-hand side) formats. Unless otherwise specified, all the call sequences are shown with the time compressed (viewed with one millisecond between pulses), time per tick is set at F7 (10 milliseconds), Auto FS is on, and the smoothness is set either on auto or at 5 (Penney *et al.* 2004; Titley Scientific 2023). The x-axis represents time in milliseconds, and the y-axis represents the average characteristic frequency. The metrics for each call, along with information related to the detector type, serial number, date, and time of each recording, are displayed in the information panels located on the right-hand side of each call sequence.



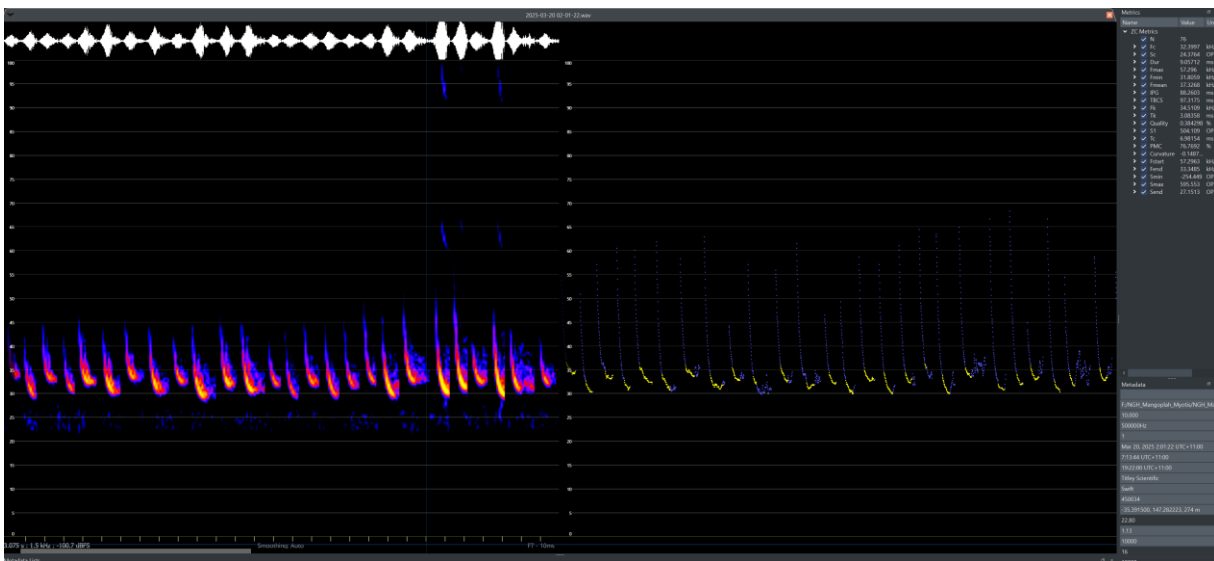


Figure 3. Call sequence for *Chalinolobus gouldii* (Gould's Wattled Bat).

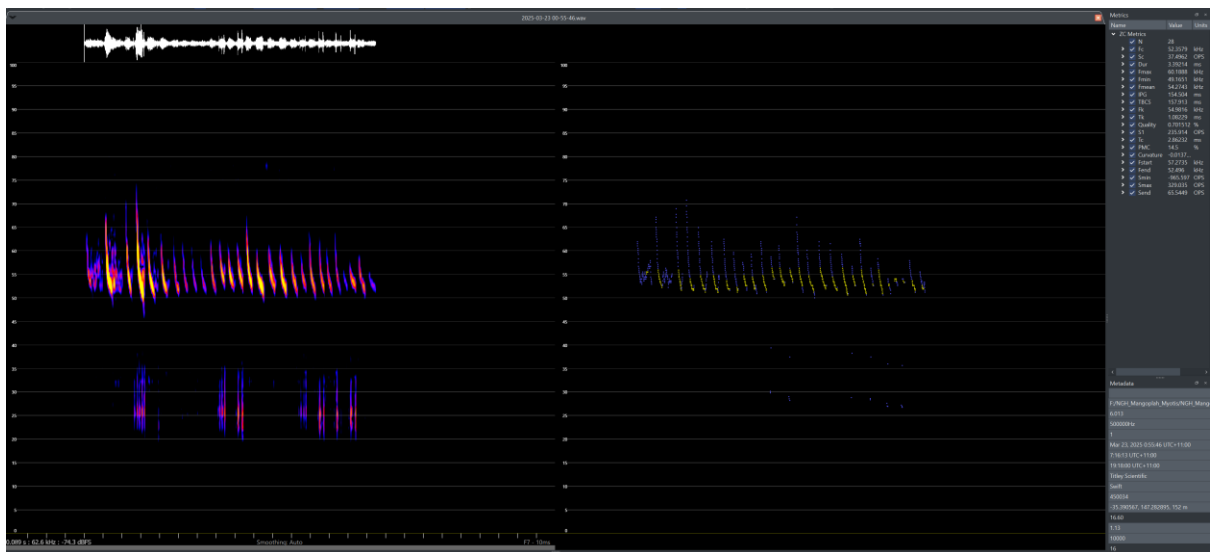


Figure 4. Call sequence for *Chalinolobus morio* (Chocolate Wattled Bat).

[illegible]

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16

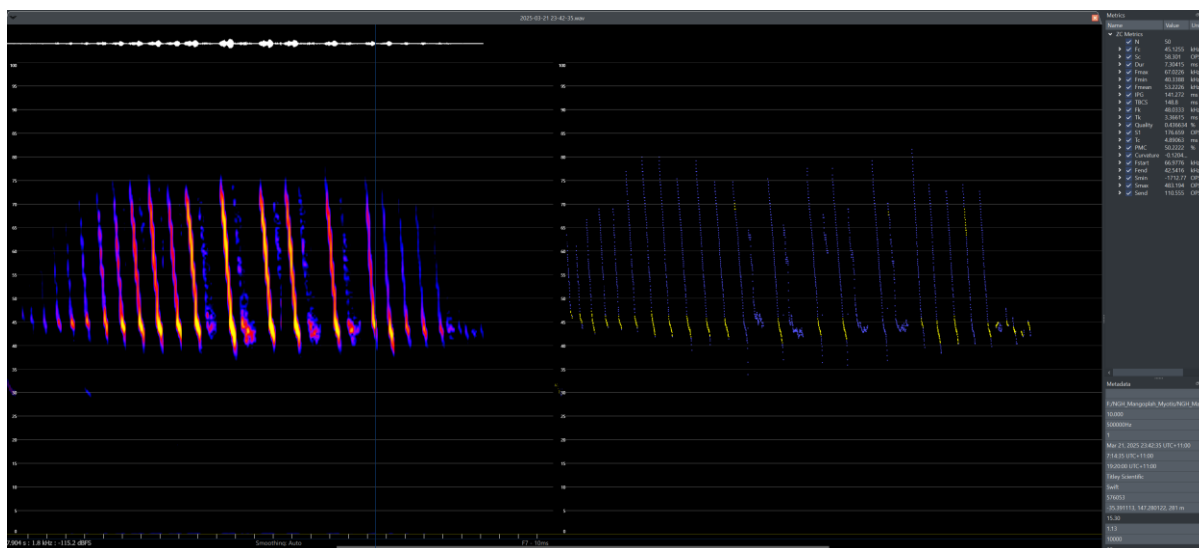


Figure 9. Call sequence for *Nyctophilus corbeni* (Corben's Long-eared Bat), *Nyctophilus geoffroyi* (Lesser Long-eared Bat), or *Nyctophilus gouldi* (Gould's Long-eared Bat).

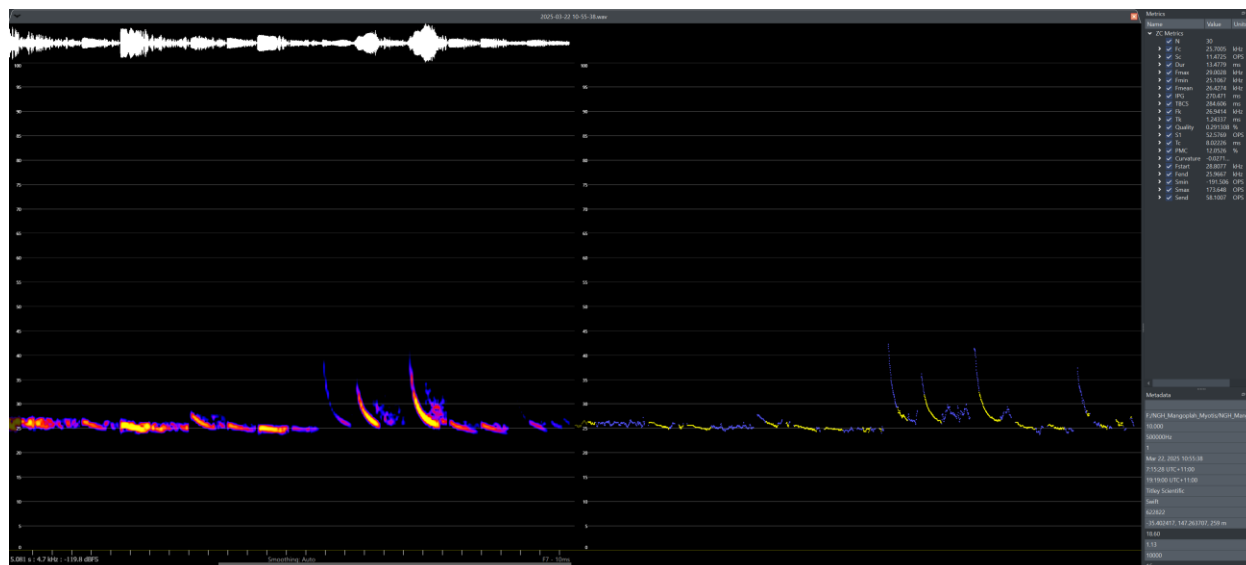


Figure 10. Call sequence for *Ozimops planiceps* (Southern Free-tailed Bat).

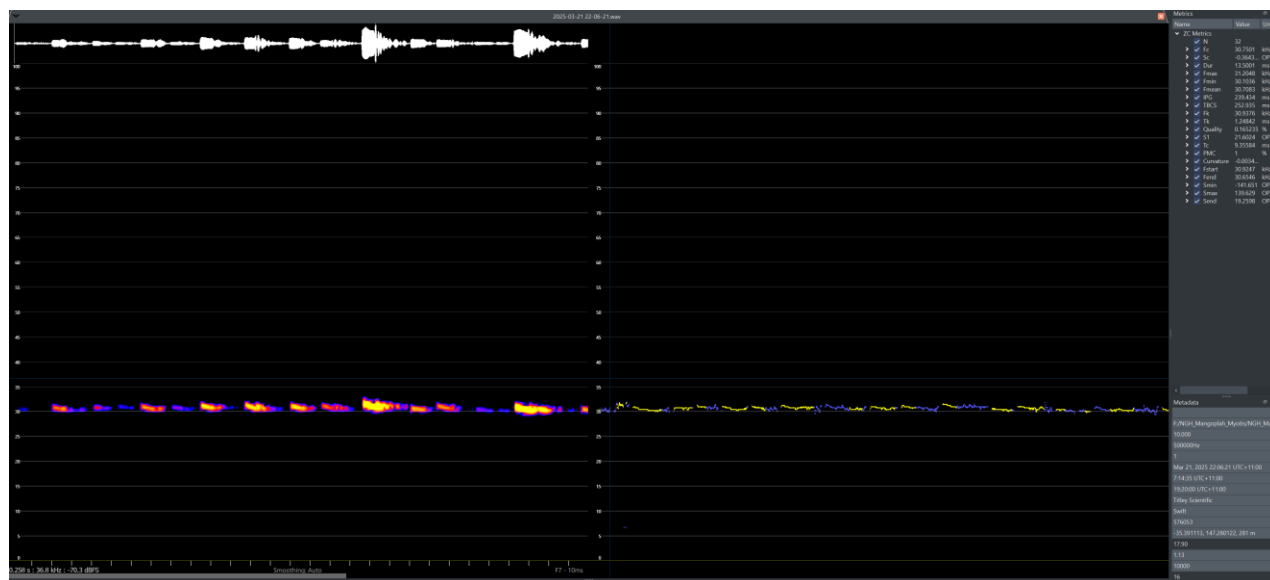
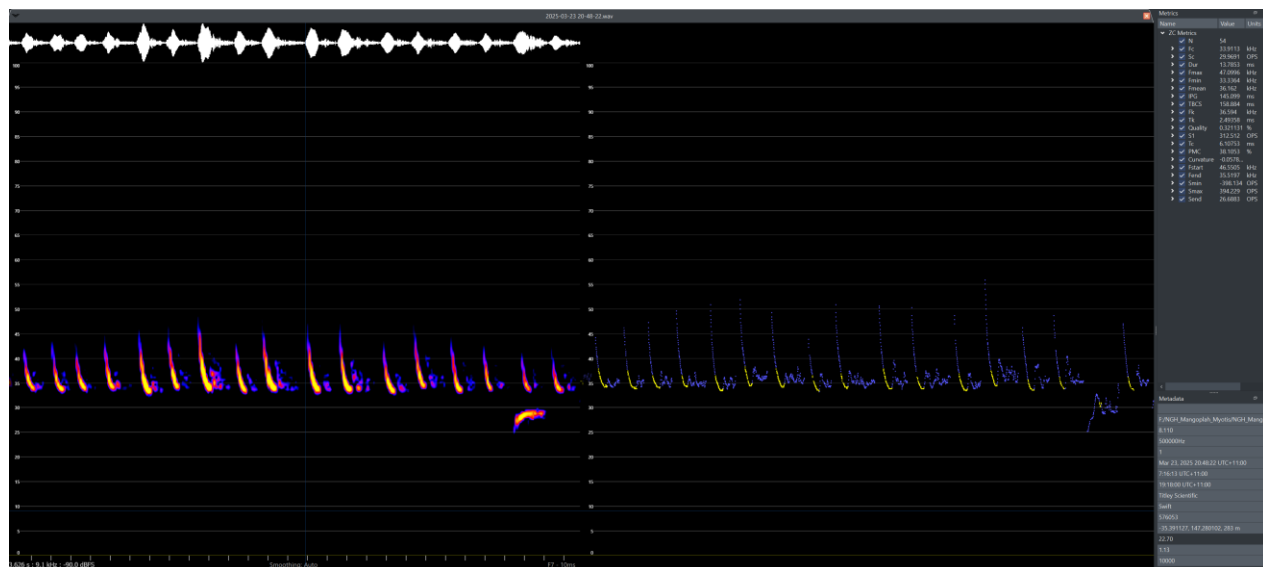


Figure 11. Call sequence for *Ozimops ridei* (Ride's Free-tailed Bat).



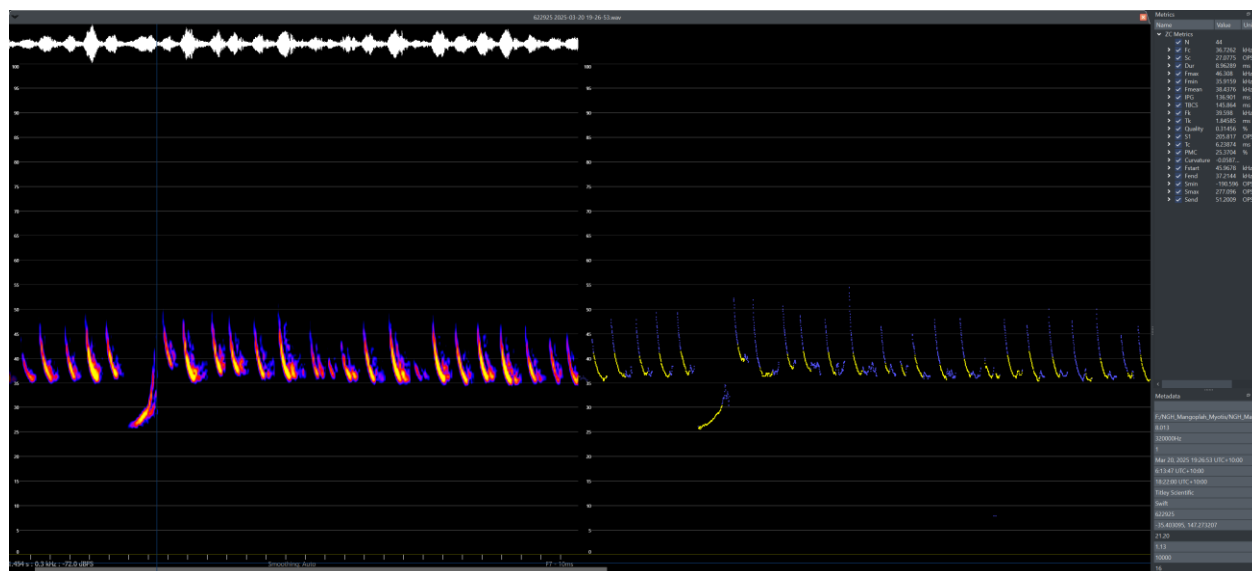


Figure 13. Call sequence for *Scotorepens greyii* (Little Broad-nosed Bat).

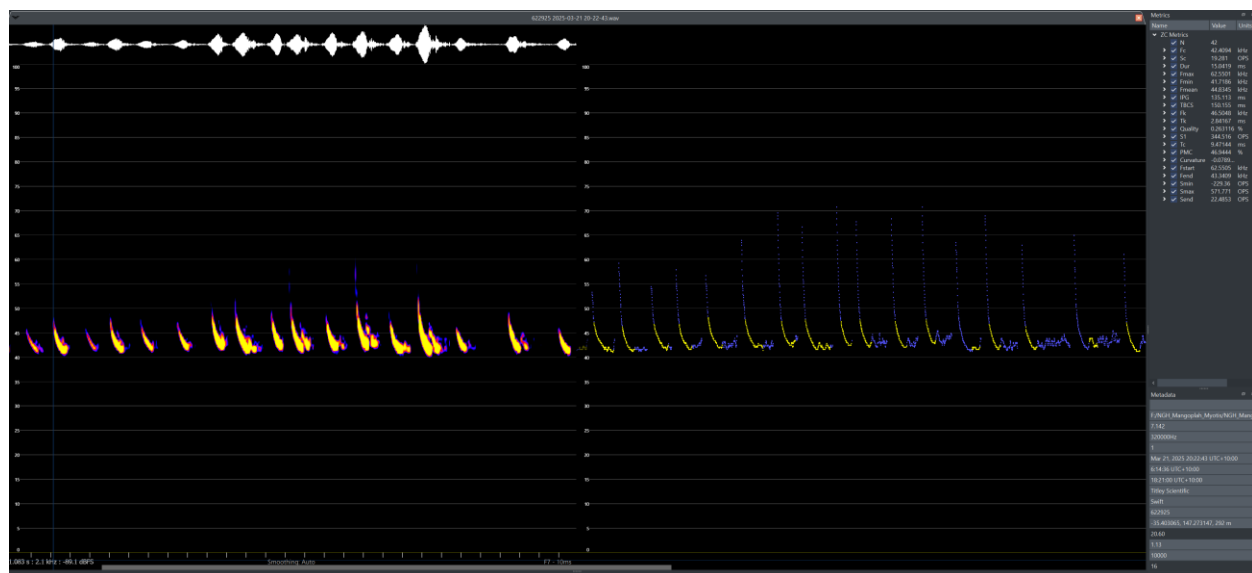


Figure 14. Call sequence for *Vespadelus darlingtoni* (Large Forest Bat).

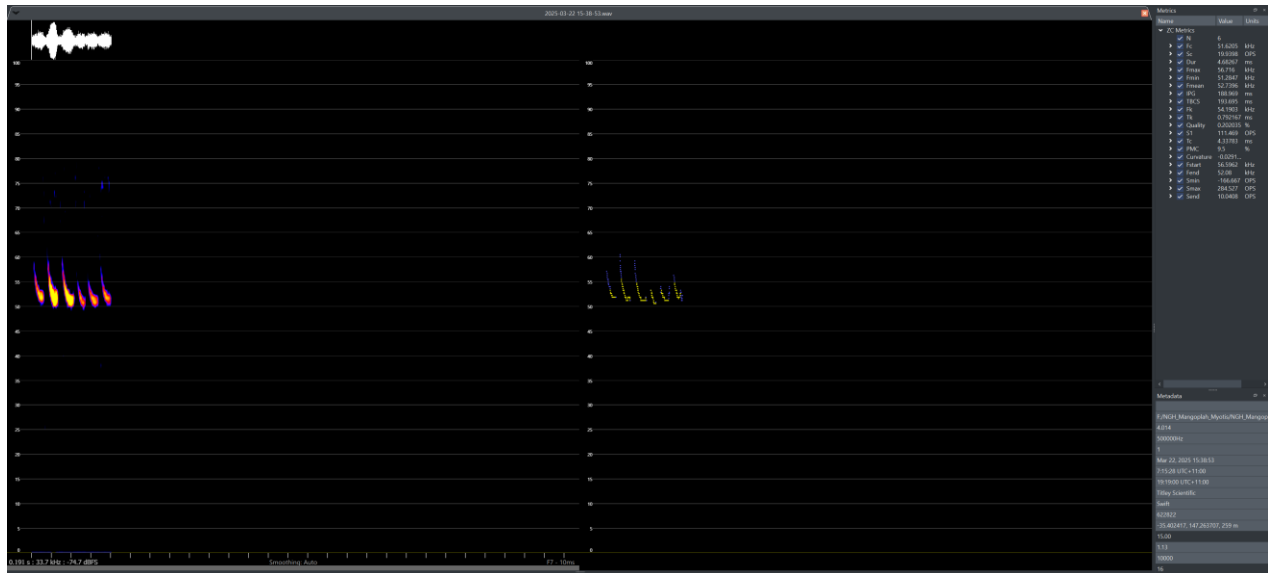


Figure 15. Potential call sequence for *Vespadelus regulus* (Large Forest Bat) or *Vespadelus vulturinus* (Little Forest Bat).

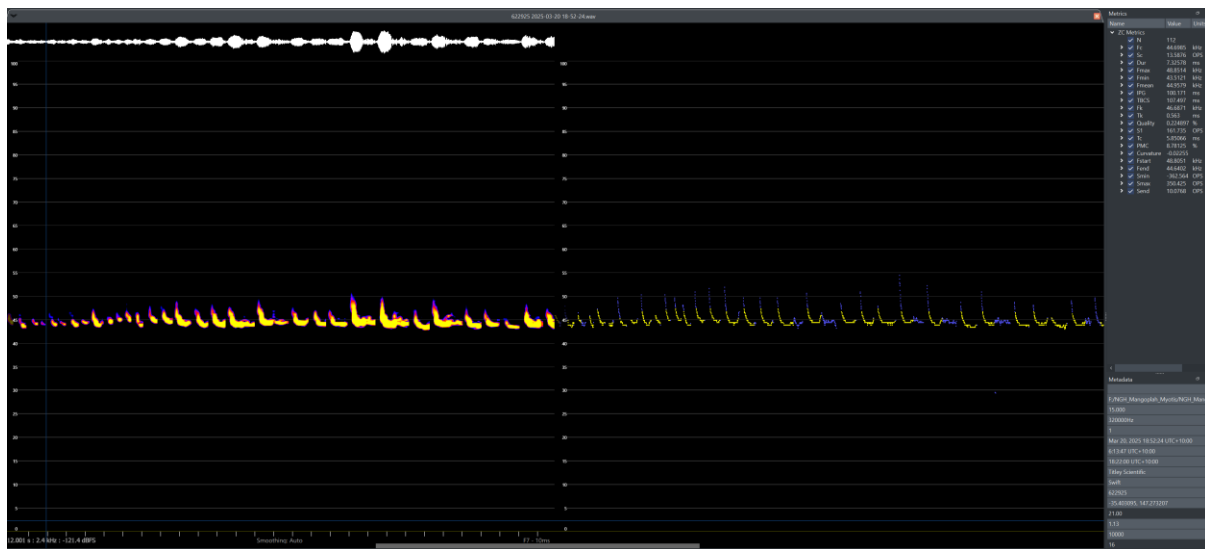


Figure 16. Call sequence for *Vespadelus vulturinus* (Little Forest Bat).

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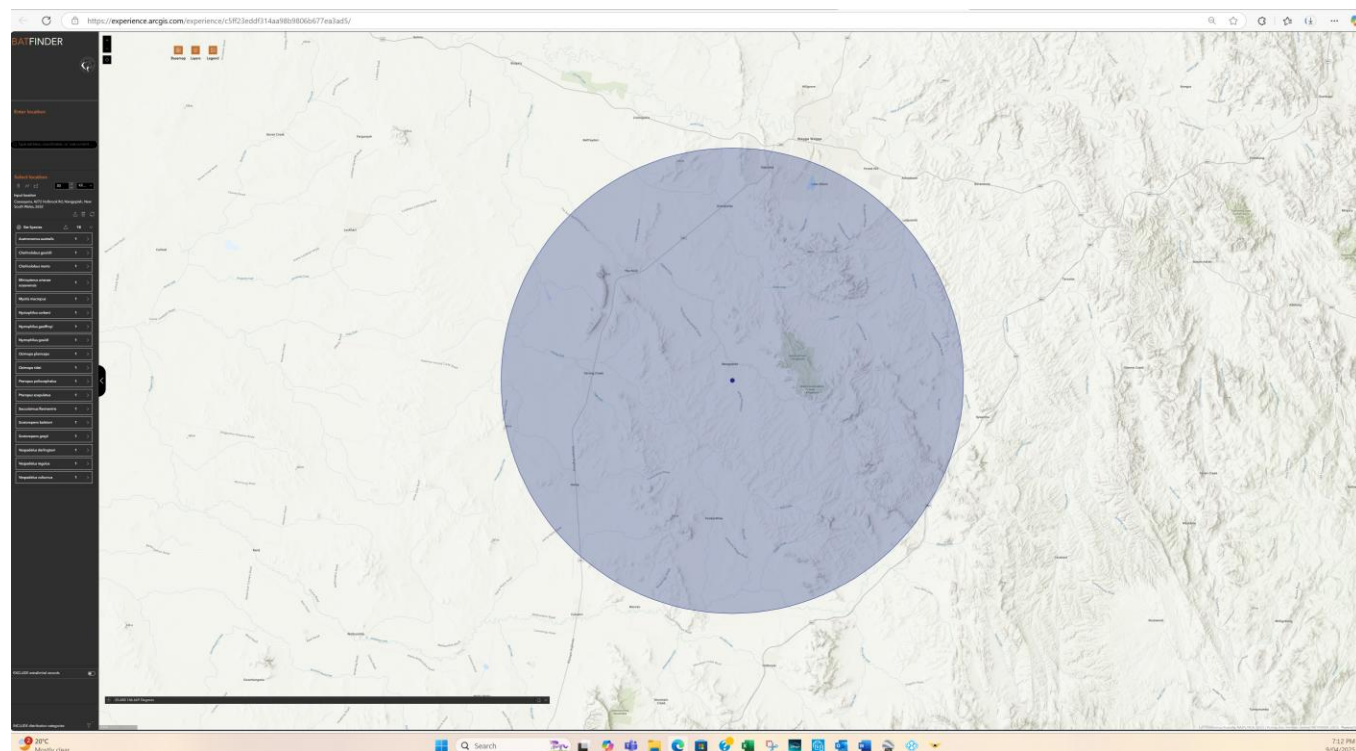
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Appendix 1. Microbat species that are predicted to occur or have been previously recorded within a 10 km radius of the approximate centre of the subject land (source Australia Bat Society Bat Maps, selected threatened species profile web pages, and NSW Bionet database). *Pteropus poliocephalus* (Grey-headed Flying-fox) and *P. scapulatus* (Little Red Flying-fox) are included in the BatMaps list contained in the figure below, however, they are megabats, and consequently, they are not considered in this report.



Appendix 2. The candidate species list

The following candidate species list was compiled following a review of Atlas of Living Australia, BatMaps (Australian Bat Society), Penny *et al.* (2011), NSW threatened species profile webpages, the NSW Bionet, Anderson *et al.* (2006), Churchill (2008), Campbell (2009), Penny *et al.* (2011), Baker and Gynther (2023). The regional species-specific call sequence characteristics and characteristic frequency (Fc) range for the Riverina biogeographic region follow Penny *et al.* (2004).

Species name	Common name	General pulse characteristic	Characteristic Frequency range
--------------	-------------	------------------------------	--------------------------------

			(kilohertz (kHz))
<i>Austronomus australis</i>	White-striped Free-tailed Bat	Flattened, sometimes curved.	10 to 15 kHz
<i>Chalinolobus gouldii</i>	Gould's Wattled Bat	Curved (hooked-shaped) pulses. Call sequences contain alternating consecutive pulses.	26.5 to 34.0 kHz
<i>Chalinolobus morio</i>	Chocolate Wattled Bat	Curved (hooked-shaped) pulses. Call sequences contain undulated consecutive pulses.	47.5 to 53.0 kHz
<i>Miniopterus orianae oceanensis</i> *	Large Bent-winged Bat	Curved, often with a down-sweeping tail	43.0 to 48 kHz
<i>Myotis macropus</i> *	Southern Myotis	Curved pulses, often with down-sweeping tails.	Variable, steep, almost vertical frequency-modulated pulses
<i>Nyctophilus corbeni</i> * and 1	Corben's Long-eared Bat	Steep (frequency modulated) near-vertical pulses	Variable, steep, almost vertical frequency-modulated pulses
<i>Nyctophilus geoffroyi</i>	Lesser Long-eared Bat	Steep (frequency modulated) near-vertical pulses	Variable, steep, almost vertical frequency-modulated pulses
<i>Nyctophilus gouldi</i>	Gould's Long-eared Bat	Steep, near-vertical pulses	Variable, steep, almost vertical frequency-modulated pulses
<i>Ozimops planiceps</i>	Southern Free-tailed Bat	Flat pulses. Sometimes with curved pulses.	26.5 to 30.0 kHz

<i>Ozimops ridei</i>	Ride's Free-tailed Bat	Flat pulses. Sometimes with curved pulses.	28.5 to 31.0 kHz
<i>Saccolaimus flaviventris</i> *	Yellow-bellied Sheath-tailed Bat	Pulses are flat or curved. When viewed in the full spectrum, good quality calls exhibit both upper and lower harmonics.	17.5 to 22.5 kHz
<i>Scotorepens balstoni</i>	Inland Broad-nosed Bat	Curved pulses, usually with a down-sweeping tail.	28.0 to 34.0 kHz
<i>Scotorepens greyii</i>	Little Broad-nosed Bat	Curved pulses, usually with a down-sweeping tail.	35.0 to 40.0 kHz
<i>Vespadelus darlingtoni</i>	Large Forest Bat	Curved, hooked pulses with up-sweeping tails.	40.0 to 44.0 kHz
<i>Vespadelus regulus</i>	Southern Forest Bat	Curved, hooked pulses with up-sweeping tails.	50.0 to 55.0 kHz
<i>Vespadelus vulturnus</i>	Little Forest Bat	Curved, hooked pulses with up-sweeping tails.	44.5 to 51.0 kHz

Source Pennay *et al.* (2004) and Reinhold *et al.* (2001). *Represents those threatened species listed as Vulnerable under the BC Act, and 1 represents those threatened species listed as Vulnerable under the Commonwealth's EPBC Act.

D.4 Incidental fauna sightings

Camera trap results

The table below outlines the species identified within the Subject Land in the baited camera trap photographs. Both native and non-native mammals and birds were identified.

Scientific Name	Common Name	Native?	Total Count
<i>Axis porcinus</i>	Hog Deer	N	1
<i>Bos taurus</i>	Cow	N	30
<i>Cracticus nigrogularis</i>	Pied Butcherbird	Y	5
<i>Cracticus torquatus</i>	Grey Butcherbird	Y	2
<i>Eolophus roseicapilla</i>	Galah	Y	1
<i>Equus caballus</i>	Horse	N	3
<i>Gymnorhina tibicen</i>	Australian Magpie	Y	6
<i>Macropus giganteus</i>	Eastern Grey Kangaroo	Y	4
<i>Manorina melanocephala</i>	Noisy Myna	Y	12
<i>Petaurus norfolcensis</i>	Squirrel Glider	Y	2
<i>Platycercus eximius</i>	Eastern Rosella	Y	7
<i>Pseudocheirus peregrinus</i>	Common Ringtail Possum	Y	3
<i>Trichosurus vulpecula</i>	Common Brushtail Possum	Y	4

Winter 2025 incidental fauna sightings

The table below lists all observed fauna species within the Subject Land during the targeted surveys conducted for Sloane's Froglet and South-eastern Glossy Black-Cockatoo.

Scientific Name	Common Name	Native?	Comments
Amphibians			
<i>Crinia parinsignifera</i>	Eastern Sign-bearing Froglet	Y	
<i>Crinia signifera</i>	Common Eastern Froglet	Y	
<i>Limnodynastes dumerilii</i>	Eastern Banjo Frog	Y	
<i>Limnodynastes peronii</i>	Striped Marsh Frog	Y	
<i>Limnodynastes tasmaniensis</i>	Spotted Marsh Frog	Y	
<i>Neobatrachus sudelli</i>	Sudell's Frog	Y	
<i>Uperoleia rugosa</i>	Wrinkled Toadlet	Y	
Birds			
<i>Anthochaera carunculata</i>	Red Wattlebird	Y	
<i>Cacatua galerita</i>	Sulphur-crested Cockatoo	Y	
<i>Corcorax melanorhamphos</i>	White-winged Chough	Y	
<i>Corvus coronoides</i>	Australian Raven	Y	
<i>Cracticus torquatus</i>	Grey Butcherbird	Y	
<i>Dacelo novaeguineae</i>	Laughing Kookaburra	Y	
<i>Egretta novaehollandiae</i>	White-faced Heron	Y	
<i>Eolophus roseicapilla</i>	Galah	Y	
<i>Grallina cyanoleuca</i>	Magpie Lark	Y	
<i>Gymnorhina tibicen</i>	Australian Magpie	Y	

Scientific Name	Common Name	Native?	Comments
<i>Manorina melanocephala</i>	Noisy Miner	Y	
<i>Ocyphaps lophotes</i>	Crested Pigeon	Y	
<i>Platycercus eximius</i>	Eastern Rosellas	Y	
<i>Psephotus haematonotus</i>	Red-rumped Parrot	Y	
<i>Strepera graculina</i>	Pied Currawong	Y	
<i>Sturnus vulgaris</i>	European Starling	N	
<i>Vanellus miles</i>	Masked Lapwing	Y	
Mammals			
<i>Lepus europaeus</i>	European Hare	N	Declared pest in NSW
<i>Macropus giganteus</i>	Eastern Grey Kangaroo	Y	
<i>Mus musculus</i>	House Mouse	N	Declared pest in NSW
<i>Vulpes vulpes</i>	European Red Fox	N	Declared pest in NSW

Spring 2025 incidental fauna sightings

The table below lists all observed fauna species within the Subject Land during the targeted flora and fauna surveys.

Scientific Name	Common Name	Native?	Comments
Birds			
<i>Alisterus scapularis</i>	Australian King Parrot	Y	
<i>Cincloramphus cruralis</i>	Brown Songlark	Y	
<i>Cacatua galerita</i>	Sulphur-crested Cockatoo	Y	
<i>Cacatua sanguinea</i>	Little Corella	Y	
<i>Chenonetta jubata</i>	Australian Wood Duck	Y	
<i>Coracina novaehollandiae</i>	Black-faced Cuckooshrike	Y	
<i>Corcorax melanorhamphos</i>	White-winged Chough	Y	
<i>Corvus coronoides</i>	Australian Raven	Y	
<i>Cracticus torquatus</i>	Grey Butcher Bird	Y	
<i>Dacelo novaeguineae</i>	Laughing Kookaburra	Y	
<i>Egretta novaehollandiae</i>	White-faced Heron	Y	
<i>Eolophus roseicapilla</i>	Galah	Y	Loud and social. Seen in flocks on site
<i>Falco cenchroides</i>	Nankeen Kestrel	Y	
<i>Grallina cyanoleuca</i>	Magpie Lark	Y	
<i>Gymnorhina tibicen</i>	Australian Magpie	Y	Territorial during breeding season.
<i>Hirundo neoxena</i>	Welcome Swallow	N	
<i>Manorina melanocephala</i>	Noisy Miner	Y	Highly territorial and chasing small birds during surveys. Could discourage other species in wooded areas.
<i>Ocyphaps lophotes</i>	Crested Pigeon	Y	
<i>Pardalotus striatus</i>	Striated Pardalote	Y	Was observed being chased by Noisy Miners.
<i>Platycercus eximius</i>	Eastern Rosella	Y	
<i>Sturnus vulgaris</i>	European Starling	N	
<i>Tadorna tadornoides</i>	Australian Shelduck	Y	
<i>Vanellus miles</i>	Masked Lapwing	Y	Territorial
Mammals			
<i>Macropus giganteus</i>	Eastern Grey Kangaroo	Y	

D.5 Targeted survey results summary

Survey date	Target species	Result
22 nd -24 th January 2025	Gang-gang Cockatoo (<i>Callocephalon fimbriatum</i>)	Not observed (absent).
22-24 th January 2025	Small Scurf-pea (<i>Cullen parvum</i>)	Not observed (absent).
22-25 th January and 16-17 th September 2025	Ausfeld's Wattle (<i>Acacia ausfeldii</i>)	Not observed (absent).
22 nd January 2025	Square-tailed Kite (<i>Lophoictinia isura</i>)	Not observed (absent).
19 th March 2025 – 29 th April 2025	Squirrel Glider (<i>Petaurus norfolcensis</i>)	Detected (present).
19 th March 2025 – 29 th April 2025	Brush-tailed Phascogale (<i>Phascogale tapoatafa</i>)	Not observed (absent).
24 th March 2025 and 29-30 th April 2025	Koala (<i>Phascolarctos cinereus</i>)	Not observed (absent).
19 th March 2025 – 29 th April 2025	Eastern Pygmy Possum (<i>Cercartetus nanus</i>)	Not observed (absent).
19-24 th March 2025	Barking Owl (<i>Ninox connivens</i>)	Detected (present).
19-24 th March 2025	Masked Owl (<i>Tyto novaehollandiae</i>)	Detected (present).
19-24 th March 2025	Bush Stone-curlew (<i>Burhinus grallarius</i>)	Not observed (absent).
19-23 rd March 2025	Key's Matchstick Grasshopper (<i>Keyacris scurra</i>)	Not observed (absent).
19-24 th March 2025	Southern Myotis (<i>Myotis macropus</i>)	Detected (present).
11-13 th August 2025 and 19 th August 2025	Sloane's Froglet (<i>Crinia sloanei</i>)	Not observed (absent).
11-13 th August 2025 and 19-20 th August 2025	South-eastern Glossy Black-Cockatoo (<i>Calyptorhynchus lathami lathami</i>)	Not observed (absent).
16-17 th September 2025	Leafless Indigo (<i>Indigofera efoliata</i>)	Not observed (absent).

Survey date	Target species	Result
16-17 th September 2025	Pine Donkey Orchid (<i>Diuris tricolor</i>)	Not observed (absent).
16-17 th September 2025	Prasophyllum sp. Wybong (<i>Prasophyllum sp. Wybong</i>)	Not observed (absent).
16-17 th September 2025	Sand-hill Spider Orchid (<i>Caladenia arenaria</i>)	Not observed (absent).
16-17 th September 2025	Silky Swainson-pea (<i>Swainsona sericea</i>)	Not observed (absent).
16-17 th September 2025	Small Purple-pea (<i>Swainsona recta</i>)	Not observed (absent).
16-19 th September 2025	Pink Cockatoo (<i>Lophochroa leadbeateri</i>)	Not observed (absent).
16-19 th September 2025	Superb Parrot (<i>Polytelis swainsonii</i>)	Not observed (absent).
16-19 th September 2025	Little Eagle (<i>Hieraaetus morphnoides</i>)	Not observed (absent).
16-19 th September 2025	White-bellied Sea Eagle (<i>Haliaeetus leucogaster</i>)	Not observed (absent).

D.6 Pink-tailed Legless Lizard expert report

Please see overleaf.

From: [Robert Speirs](#)
To: [Maddy Shaw](#)
Cc: [Sarah Hillis](#); [Sam Reid](#); [Julie Gooding](#); [Jarmin Thornberry](#)
Subject: RE: Pink-tailed Legless Lizard Expert Report
Date: Monday, 11 August 2025 3:44:15 PM
Attachments: [image001.png](#)
[image002.png](#)
[image009.png](#)
[image011.png](#)
[image012.png](#)
[image016.png](#)
[aprasia-parapulchella-distribution-for-biodiversity-assessment-methods-assessments_interpretive-.pdf](#)

Hi Maddy,

I hope you had a good weekend.

The NSW Government has just released the "Aprasia_parapulchella_distribution_for_BAM" spatial layer to be used with the attached guide.

As shown in the figure below, the Mangoplah BESS subject land is not 'occurring in the predictive model footprint', and therefore it does not support suitable habitat as per the below decision matrix and the species does not need to be considered for the subject land under the BAM.

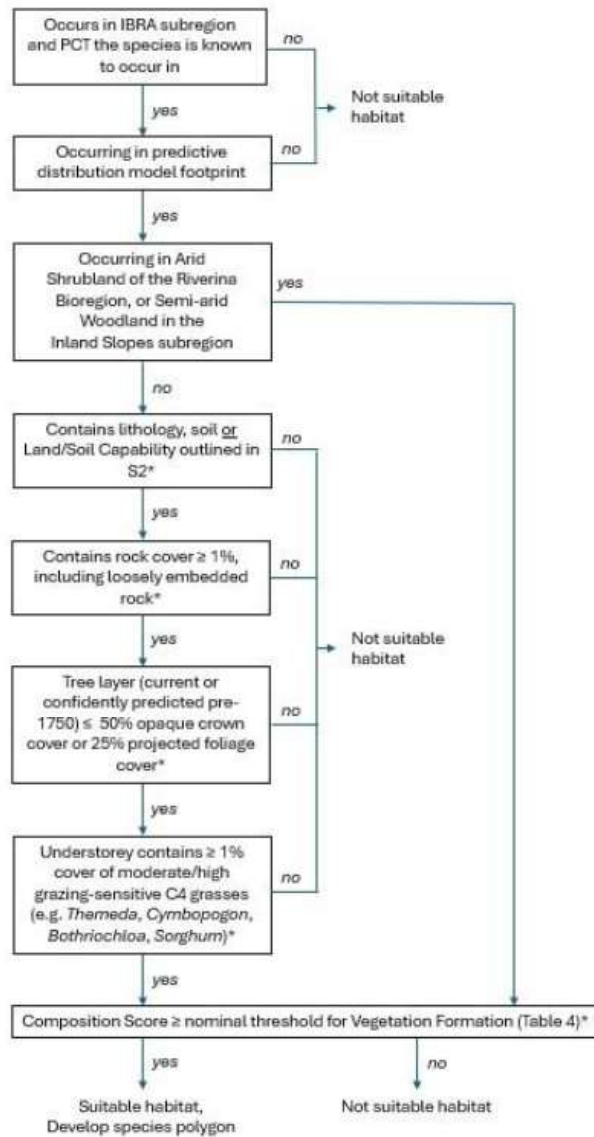
In light of the above, there is no requirement for an expert report for the Pink-tailed Legless Lizard. Please let me know if the project is likely to go ahead and I will revise our proposal to just cover the Striped Legless Lizard and the Golden Sun Moth.

Thanks and regards,

Rob

Decision matrix

The below decision matrix (**Figure 2**) should be followed when considering the species polygon as part of your Biodiversity Assessment Report.



* Trigger for Species Polygon delineation

Legend

3427 NGH - Mangoplah BESS - PTLL,SLL,GSM Exp Reports

3427 Subject Land

Pink-tailed Legless Lizard - Species Occurrence Mapping

Aprasia parapulchella distribution for BAM

Pink-tailed Legless Lizard - Records

NSW Wildlife Atlas - BioNet

A. parapulchella - BioNet



Scale 1:300,000 @ A4, GDA 2020, MGA Zone

Acknowledgement: Image (c) Esri 2025

Attachment A. Subject Land for SLL, PTLL, GSM Expert Reports 3427

Capital Ecology Project No: 3427

Drawn by: R. Speirs

Date: 11 August 2025



Appendix E BAM calculator credit reports

Please see overleaf.

BAM Vegetation Zones Report

Proposal Details

Assessment Id	Assessment name	BAM data last updated *
00052652/BAAS18074/24/00052653	Mangoplah BESS	05/08/2025
Assessor Name	Report Created	BAM Data version *
Julie Gooding	06/11/2025	Current classification (live - default) (82)
Assessor Number	Assessment Type	BAM Case Status
BAAS18074	Major Projects	Finalised
Assessment Revision	BOS entry trigger	Date Finalised
2		06/11/2025

* 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	277_Woodland_good	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	Woodland_good	0.22	1	

BAM Vegetation Zones Report

2	277_Woodland_mod	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	Woodland_mod	0.13	1	
3	277_DG_Low	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	DG_Low	1.5	1	
4	76_DG_Low	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	DG_Low	0.15	1	

BAM Predicted Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00052652/BAAS18074/24/00052653	Mangoplah BESS	05/08/2025
Assessor Name	Report Created	BAM Data version *
Julie Gooding	06/11/2025	Current classification (live - default) (82)
Assessor Number	Assessment Type	BAM Case Status
BAAS18074	Major Projects	Finalised
Assessment Revision	BOS entry trigger	Date Finalised
2		06/11/2025

* 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	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion 76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Black-chinned Honeyeater (eastern subspecies)	Melithreptus gularis gularis	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion 76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Brown Treecreeper (eastern subspecies)	Climacteris picumnus victoriae	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion 76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Corben's Long-eared Bat	Nyctophilus corbeni	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion 76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions

BAM Predicted Species Report

Diamond Firetail	Stagonopleura guttata	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
		76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Dusky Woodswallow	Artamus cyanopterus cyanopterus	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
		76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Flame Robin	Petroica phoenicea	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
		76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Gang-gang Cockatoo	Callocephalon fimbriatum	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Grey-crowned Babbler (eastern subspecies)	Pomatostomus temporalis temporalis	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
		76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Grey-headed Flying-fox	Pteropus poliocephalus	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
		76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Large Bent-winged Bat	Miniopterus orianae oceanensis	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Little Eagle	Hieraetus morphnoides	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
		76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Little Lorikeet	Glossopsitta pusilla	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Little Pied Bat	Chalinolobus picatus	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions

BAM Predicted Species Report

Painted Honeyeater	<i>Grantiella picta</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion 76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Pink Cockatoo	<i>Lophochroa leadbeateri</i>	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Regent Honeyeater	<i>Anthochaera phrygia</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Scarlet Robin	<i>Petroica boodang</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion 76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
South-eastern Hooded Robin	<i>Melanodryas cucullata cucullata</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion 76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Southern Whiteface	<i>Aphelocephala leucopsis</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion 76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Speckled Warbler	<i>Chthonicola sagittata</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion 76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Spotted Harrier	<i>Circus assimilis</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Spotted-tailed Quoll	<i>Dasyurus maculatus</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Square-tailed Kite	<i>Lophoictinia isura</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion 76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions

BAM Predicted Species Report

Superb Parrot	<i>Polytelis swainsonii</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion 76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Swift Parrot	<i>Lathamus discolor</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion 76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Turquoise Parrot	<i>Neophema pulchella</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion 76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Varied Sittella	<i>Daphoenositta chrysoptera</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion 76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion 76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
White-throated Needle-tail	<i>Hirundapus caudacutus</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion 76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Yellow-bellied Sheath-tail-bat	<i>Saccolaimus flaviventris</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion 76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions

Threatened species Manually Added

Common Name	Scientific Name
Corben's Long-eared Bat	<i>Nyctophilus corbeni</i>

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

BAM Predicted Species Report

Common Name	Scientific Name	Plant Community Type(s)
South-eastern Glossy Black-Cockatoo	<i>Calyptrorhynchus lathami lathami</i>	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions

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
South-eastern Glossy Black-Cockatoo	<i>Calyptrorhynchus lathami lathami</i>	Habitat constraints

BAM Candidate Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00052652/BAAS18074/24/00052653	Mangoplah BESS	05/08/2025
Assessor Name	Report Created	BAM Data version *
Julie Gooding	06/11/2025	Current classification (live - default) (82)
Assessor Number	Assessment Type	BAM Case Status
BAAS18074	Major Projects	Finalised
Assessment Revision	BOS entry trigger	Date Finalised
2		06/11/2025

* 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
<i>Acacia ausfeldii</i> Ausfeld's Wattle	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?
<i>Ammobium craspedioides</i> Yass Daisy	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Aprasia parapulchella</i> 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?

BAM Candidate Species Report

<i>Austrostipa wakoolica</i> A spear-grass	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Burhinus grallarius</i> Bush Stone-curlew	No (surveyed)	☒ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Caladenia arenaria</i> Sand-hill Spider Orchid	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☒ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Callocephalon fimbriatum</i> Gang-gang Cockatoo	No (surveyed)	☒ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Calyptrorhynchus lathami lathami</i> South-eastern Glossy Black-Cockatoo	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☒ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Cercartetus nanus</i> Eastern Pygmy-possum	No (surveyed)	☐ Jan ☐ Feb ☒ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

BAM Candidate Species Report

<i>Crinia sloanei</i> Sloane's Froglet	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☒ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Cullen parvum</i> Small Scurf-pea	No (surveyed)	☒ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Delma impar</i> Striped Legless Lizard	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Diuris tricolor</i> Pine Donkey Orchid	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☒ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Euphrasia arguta</i> Euphrasia arguta	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Haliaeetus leucogaster</i> White-bellied Sea-Eagle	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☒ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

BAM Candidate Species Report

<i>Hieraaetus morphnoides</i> Little Eagle	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☒ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Indigofera efoliata</i> Leafless Indigo	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☒ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Keyacris scurra</i> Key's Matchstick Grasshopper	No (surveyed)	☐ Jan ☐ Feb ☒ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Lophochroa leadbeateri</i> Pink Cockatoo	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☒ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Lophoictinia isura</i> Square-tailed Kite	No (surveyed)	☒ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☒ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Myotis macropus</i> Southern Myotis	Yes (surveyed)	☐ Jan ☐ Feb ☒ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

BAM Candidate Species Report

<i>Ninox connivens</i> Barking Owl	Yes (surveyed)	☒ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Petaurus norfolcensis</i> Squirrel Glider	Yes (surveyed)	☐ Jan ☐ Feb ☒ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Petaurus norfolcensis - endangered population</i> Squirrel Glider in the Wagga Wagga Local Government Area	Yes (surveyed)	☐ Jan ☐ Feb ☒ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Phascogale tapoatafa</i> Brush-tailed Phascogale	No (surveyed)	☐ Jan ☐ Feb ☒ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Phascolarctos cinereus</i> Koala	No (surveyed)	☐ Jan ☐ Feb ☒ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Polytelis swainsonii</i> Superb Parrot	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☒ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

BAM Candidate Species Report

<i>Prasophyllum petilum</i> Tarengo Leek Orchid	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☒ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Prasophyllum sp. Wybong</i> Prasophyllum sp. Wybong	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☒ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Pteropus poliocephalus</i> Grey-headed Flying-fox	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?
<i>Swainsona recta</i> Small Purple-pea	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☒ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Swainsona sericea</i> Silky Swainson-pea	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☒ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Synemon plana</i> Golden Sun Moth	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

BAM Candidate Species Report

<i>Tyto novaehollandiae</i> Masked Owl	Yes (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
Booroolong Frog	Litoria booroolongensis	Habitat degraded
Brush-tailed Rock-wallaby	Petrogale penicillata	Habitat constraints
Large Bent-winged Bat	Miniopterus orianae oceanensis	Habitat constraints
Large-eared Pied Bat	Chalinolobus dwyeri	Habitat constraints
Regent Honeyeater	Anthochaera phrygia	Habitat constraints
Swift Parrot	Lathamus discolor	Habitat constraints

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00052652/BAAS18074/24/00052653	Mangoplah BESS	05/08/2025
Assessor Name	Report Created	BAM Data version *
Julie Gooding	06/11/2025	Current classification (live - default) (82)
Assessor Number	BAM Case Status	Date Finalised
BAAS18074	Finalised	06/11/2025
Assessment Revision	BOS entry trigger	Assessment Type
2		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 SAIL	Ecosystem credits

Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion

1	277_Wood land_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 Highla	54.6	54.6	0.22	Population size	High Sensitivity to Gain	Critically Endangered Ecological Community	Not Listed	2.50	True	8
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BAM Credit Summary Report

2	277_Wood land_mod	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 Highla	39	39.0	0.13	Population size	High Sensitivity to Gain	Critically Endangered Ecological Community	Not Listed	2.50	True	3
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BAM Credit Summary Report

3	277_DG_Low	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 Highla	35.2	35.2	1.5	Population size	High Sensitivity to Gain	Critically Endangered Ecological Community	Not Listed	2.50	True	33
											Subtotal	44

Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions											
4	76_DG_Low	Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	28.3	28.3	0.15	Environment Protection and Conservation Act listing status	High Sensitivity to Gain	Not Listed	Endangered	2.00	2
										Subtotal	2
										Total	46

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 SAIL	Species credits
<i>Ammobium craspedioides</i> / Yass Daisy (Flora)									
277_Woodland_good	N/A	N/A	10	Biodiversity Conservation Act listing status	Quantity class of viable seeds produced	Vulnerable	Vulnerable	False	20
277_Woodland_mod	N/A	N/A	10	Biodiversity Conservation Act listing status	Quantity class of viable seeds produced	Vulnerable	Vulnerable	False	20

BAM Credit Summary Report

277_DG_Low	N/A	N/A	10	Biodiversity Conservation Act listing status	Quantity class of viable seeds produced	Vulnerable	Vulnerable	False	20
76_DG_Low	N/A	N/A	10	Biodiversity Conservation Act listing status	Quantity class of viable seeds produced	Vulnerable	Vulnerable	False	20
								Subtotal	80
<i>Austrostipa wakoolica / A spear-grass (Flora)</i>									
277_Woodland_good	54.6	54.6	0.22	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	6
277_Woodland_mod	39.0	39.0	0.13	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	3
277_DG_Low	35.2	35.2	1.5	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	26

BAM Credit Summary Report

76_DG_Low	28.3	28.3	0.15	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	2
								Subtotal	37
<i>Delma impar / Striped Legless Lizard (Fauna)</i>									
277_Woodland_good	54.6	54.6	0.22	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Vulnerable	False	5
277_Woodland_mod	39.0	39.0	0.13	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Vulnerable	False	2
277_DG_Low	35.2	35.2	1.5	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Vulnerable	False	20
76_DG_Low	28.3	28.3	0.15	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Vulnerable	False	2
								Subtotal	29

<i>Euphrasia arguta</i> / <i>Euphrasia arguta</i> (Flora)									
277_Woodland_good	54.6	54.6	0.22	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Critically Endangered	Critically Endangered	True	9
277_Woodland_mod	39.0	39.0	0.13	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Critically Endangered	Critically Endangered	True	4
277_DG_Low	35.2	35.2	1.5	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Critically Endangered	Critically Endangered	True	40
76_DG_Low	28.3	28.3	0.15	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Critically Endangered	Critically Endangered	True	3
								Subtotal	56
<i>Myotis macropus</i> / <i>Southern Myotis</i> (Fauna)									
277_Woodland_good	54.6	54.6	0.2	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	5

BAM Credit Summary Report

277_Woodland_mod	39.0	39.0	0.07	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	1
277_DG_Low	35.2	35.2	0.65	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	11
76_DG_Low	28.3	28.3	0.09	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	1
								Subtotal	18
<i>Ninox connivens / Barking Owl (Fauna)</i>									
277_Woodland_good	54.6	54.6	0.22	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	6
277_Woodland_mod	39.0	39.0	0.01	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	1
								Subtotal	7

<i>Petaurus norfolcensis / Squirrel Glider (Fauna)</i>									
277_Woodland_mod	39.0	39.0	0.05	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	1
								Subtotal	1
<i>Petaurus norfolcensis - endangered population / Squirrel Glider in the Wagga Wagga Local Government Area (Fauna)</i>									
277_Woodland_mod	39.0	39.0	0.05	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Endangered Population	Not Listed	False	1
								Subtotal	1
<i>Synemon plana / Golden Sun Moth (Fauna)</i>									
277_Woodland_good	54.6	54.6	0.22	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Vulnerable	False	5
277_Woodland_mod	39.0	39.0	0.13	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Vulnerable	False	2

BAM Credit Summary Report

277_DG_Low	35.2	35.2	1.5	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Vulnerable	False	20
76_DG_Low	28.3	28.3	0.15	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Vulnerable	False	2
								Subtotal	29
<i>Tyto novaehollandiae / Masked Owl (Fauna)</i>									
277_Woodland_good	54.6	54.6	0.22	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	6
277_Woodland_mod	39.0	39.0	0.01	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	1
								Subtotal	7



BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00052652/BAAS18074/24/00052653	Mangoplah BESS	05/08/2025
Assessor Name	Assessor Number	BAM Data version *
Julie Gooding	BAAS18074	Current classification (live - default) (82)
Proponent Names	Report Created	BAM Case Status
	06/11/2025	Finalised
Assessment Revision	BOS entry trigger	Assessment Type
2		Major Projects
Date Finalised	* 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.	
06/11/2025		

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 Highla	Critically Endangered Ecological Community	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion

BAM Biodiversity Credit Report (Like for like)

Species
Euphrasia arguta / Euphrasia arguta

Additional Information for Approval

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
Calyptrorhynchus lathami lathami / South-eastern Glossy Black-Cockatoo

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
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 Highla	1.9	11	33	44
76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	0.2	0	2	2

76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions

Like-for-like credit retirement options

Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia This includes PCT's: 76, 80, 81, 82, 110, 237, 248, 250, 267, 3405	-	76_DG_Low	No	2	Inland Slopes, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

BAM Biodiversity Credit Report (Like for like)

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, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla 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,	-	277_Woodland _good	Yes	8	Inland Slopes, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

BAM Biodiversity Credit Report (Like for like)

	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 Highla This includes PCT's: 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281,		277_Woodland_mod	Yes	3	Inland Slopes, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

BAM Biodiversity Credit Report (Like for like)

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	-	277_DG_Low	No	33	Inland Slopes, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

BAM Biodiversity Credit Report (Like for like)

	North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla 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,					
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BAM Biodiversity Credit Report (Like for like)

3387, 3388, 3394, 3395, 3396, 3397, 3398, 3399, 3406, 3415, 3533, 4147, 4149, 4150					
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Species Credit Summary

Species	Vegetation Zone/s	Area / Count	Credits
Ammobium craspedioides / Yass Daisy	277_Woodland_good, 277_Woodland_mod, 277_DG_Low, 76_DG_Low	40.0	80.00
Austrostipa wakoolica / A spear-grass	277_Woodland_good, 277_Woodland_mod, 277_DG_Low, 76_DG_Low	2.0	37.00
Delma impar / Striped Legless Lizard	277_Woodland_good, 277_Woodland_mod, 277_DG_Low, 76_DG_Low	2.0	29.00
Euphrasia arguta / Euphrasia arguta	277_Woodland_good, 277_Woodland_mod, 277_DG_Low, 76_DG_Low	2.0	56.00
Myotis macropus / Southern Myotis	277_Woodland_good, 277_Woodland_mod, 277_DG_Low, 76_DG_Low	1.0	18.00
Ninox connivens / Barking Owl	277_Woodland_good, 277_Woodland_mod	0.2	7.00

BAM Biodiversity Credit Report (Like for like)

Petaurus norfolcensis / Squirrel Glider	277_Woodland_mod	0.1	1.00
Petaurus norfolcensis - endangered population / Squirrel Glider in the Wagga Wagga Local Government Area	277_Woodland_mod	0.1	1.00
Synemon plana / Golden Sun Moth	277_Woodland_good, 277_Woodland_mod, 277_DG_Low, 76_DG_Low	2.0	29.00
Tyto novaehollandiae / Masked Owl	277_Woodland_good, 277_Woodland_mod	0.2	7.00

Credit Retirement Options

Like-for-like credit retirement options

Ammobium craspedioides / Yass Daisy	Spp	IBRA subregion
	Ammobium craspedioides / Yass Daisy	Any in NSW
Austrostipa wakoolica / A spear-grass	Spp	IBRA subregion
	Austrostipa wakoolica / A spear-grass	Any in NSW
Delma impar / Striped Legless Lizard	Spp	IBRA subregion
	Delma impar / Striped Legless Lizard	Any in NSW
Euphrasia arguta / Euphrasia arguta	Spp	IBRA subregion
	Euphrasia arguta / Euphrasia arguta	Any in NSW

BAM Biodiversity Credit Report (Like for like)

Myotis macropus / Southern Myotis	Spp	IBRA subregion
	Myotis macropus / Southern Myotis	Any in NSW
Ninox connivens / Barking Owl	Spp	IBRA subregion
	Ninox connivens / Barking Owl	Any in NSW
Petaurus norfolcensis / Squirrel Glider	Spp	IBRA subregion
	Petaurus norfolcensis / Squirrel Glider	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
Synemon plana / Golden Sun Moth	Spp	IBRA subregion
	Synemon plana / Golden Sun Moth	Any in NSW
Tyto novaehollandiae / Masked Owl	Spp	IBRA subregion
	Tyto novaehollandiae / Masked Owl	Any in NSW

Appendix F Staff qualifications and experience

Name	Title	Qualifications / experience	Role in BDAR
Julie Gooding	Technical Lead	Accredited Assessor B. Sci (Biology) (BAAS18074)	Supervision, BAM-C, technical review, site assessment, VI plot surveys Targeted flora and fauna surveys
Jared Graham-Higgs	Spatial Analyst	Spatial Analyst, Ecologist B. EnvSc	Map preparation
Rodney Armistead	Ecologist	Ecologist Fauna Ecology / Plant Pathology (PhD)	Anabat assessment and report
Maddie Robertson	Ecologist	Ecologist BSc (Bio & Con), BEnv	Targeted fauna surveys, main report author, Assessments of Significance
Justin Solomons	Ecologist	Ecologist B. EnvSc (ConsEcol)	Targeted fauna surveys, report author
Michael Cleland	Ecologist	Ecologist BEnvSc and Mgt (Hons)	Targeted flora surveys, VI plot surveys, site assessment
Julia Chabros	Ecologist	Ecologist B. EnvMgmt (Ecology), B. Sci (Hons 1)	Targeted flora surveys, site assessment
Evan Creek	Ecologist	Ecologist BSc	Site assessment, VI plot surveys
Liarna Miller	Ecologist	Graduate Ecologist BEnvSc and Mgt (Ecol & Cons)	Targeted flora and fauna surveys, report author



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