



Biodiversity Development Assessment Report

Gregadoo Solar Farm (SSD 8825) - Modification

Boiling Down Road Gregadoo, NSW 2650 (Lot 43 DP1303215 and Lot 11 DP1043022)

Prepared by Simon Vinson (BAAS23004)

27 September 2024



ABOUT THIS DOCUMENT

This document has been prepared by Senior Ecologist Simon Vinson, Accredited Biodiversity Assessor NSW licence BAAS23004.

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DOCUMENT TRACKING

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Executive summary

Development description

The proponent proposes a modification to the existing Development Approval for the State Significant Development (SSD) Gregadoo Solar Farm (SSD 8825) located at 123 Redband Road (Lot 11 DP1043022) and 50 Ashfords Road (Lot 1 DP 524499), Gregadoo NSW 2650. This fourth modification aims to optimise the approved solar farm's design and operations.

The optimised design aims to utilise the approved development footprint more effectively by integrating a Battery Energy Storage System (BESS) while sustaining a 65 MW(AC) power output. Modification 4 also proposes:

- An additional access point and internal access track from Boiling Down Road to the approved overhead transmission line, connecting the Gregadoo Solar Farm substation to the Transgrid substation
- Additional assessment to confirm the potential impacts of Over Size Over Mass (OSOM) vehicle movements within the site.

This modification enhances the project's efficiency and infrastructure while ensuring a thorough understanding of potential effects.

PLANNING PATHWAY

A Biodiversity Development Assessment Report (BDAR) is a requirement of the application for development consent of SSD under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and assessment under the *Biodiversity Conservation Act 2016* (BC Act).

The approved Gregadoo Solar Farm is classified as SSD under the State and Regional Development, State Environmental Planning Policy (SEPP). As required by the Secretary's Environmental Assessment Requirements (SEARs), a BDAR was prepared by NGH Environmental that assessed the impacts of Gregadoo Solar Farm using the Biodiversity Assessment Methodology (BAM). The BDAR was approved and incorporated into condition 12 of the development consent (SSD 8825) and the project was approved on 11 December 2018.

The proposed modification involves works both within and outside the approved Gregadoo Solar Farm development footprint. This BDAR is a separate assessment to address Stage 1 and 2 of the BAM 2020 which only applies to the area outside the approved Gregadoo Solar Farm development footprint.

This BDAR also assesses Matters of National Environmental Significance (MNES) listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Key biodiversity findings

PLANT COMMUNITY TYPE AND ECOLOGICAL COMMUNITIES

The subject land contains two native plant community types (PCTs):

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

PCT 76: *Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions* is defined into three vegetation zones relative to its broad condition class:

- Zone 1: Remnant woodland with a mostly intact canopy and a ground layer mostly composed of exotic species and containing a low diversity and cover of native groundcover species.
- Zone 2: Modified grassland that is predominately exotic in composition though contains some native groundcover species.
- Zone 3: Derived native grassland that contains a mixed composition of native and exotic ground cover species as well as minor overstory regeneration.

This PCT is associated with an Endangered Ecological Community (EEC), commonly known as Grey Box Woodland, which is protected under both Commonwealth and NSW legislation as:

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

The condition of the vegetation on the subject land meets the criteria for listing under the BC Act, though doesn't meet the condition criteria for protection under the EPBC Act.

PCT 277: *Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion* is present in small portions of the subject land (roadside verges and plantations) and has also been described as containing two vegetation zones relative to its broad condition class:

- Zone 4: Planted vegetation composed of a planted overstory of mostly non-endemic species and containing a low diversity and cover of native groundcover species.
- Zone 5: Modified grassland that is predominately exotic in composition and contains few native groundcover species.

This PCT is associated with the Critically Endangered Ecological Community (CEEC), commonly known as Box Gum Woodland, and listed under the EPBC Act and BC Act as:

- *White box - yellow box - Blakely's red gum grassy woodlands and derived native grasslands* (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* (BC Act).

The condition of the vegetation on the subject land meets the criteria for listing under the BC Act, though doesn't meet condition criteria for protection under the EPBC Act.

THREATENED SPECIES AND HABITAT

Assessment was undertaken for threatened species and associated habitats likely to occur within the subject land. This included a review of relevant databases, entry of data into the BAM calculator (BAM-C), and field surveys undertaken to determine the presence of habitat and microhabitat constraints.

Ecologically valuable habitats for threatened and native species were identified within the subject land, particularly within Vegetation Zone 1, and include but are not limited to:

- native vegetation including remnant woodland trees and modified grasslands,
- mature hollow-bearing trees, and
- ephemeral drainage lines and an artificial dam.

A total of 30 ecosystem credit species were predicted to occur within the subject land, two of which were excluded from further assessment due to associated habitat constraints and/or geographic limitations.

A total of 35 species credit species were predicted to occur within the subject land, nine of which were excluded from further assessment based on associated geographic limitations and/or habitat/microhabitat constraints.

No threatened species were identified incidentally, as part of the overall biodiversity survey, and/or during targeted searches within the subject land, however the following species have been identified during field surveys for the original Gregadoo Solar Farm BDAR (NGH, 2018):

- Yellow-bellied Sheath-tail-bat (*Saccolaimus flaviventris*), and
- Superb Parrot (*Polytelis swainsonii*).

Additionally, although not recorded within recent surveys, a range of species credit species have been assumed to be present within the subject land as a precautionary measure, due to time restrictions for targeted surveys to be undertaken.

Other protected species with potential to be impacted by the proposal were identified within the project area including a range of non-threatened native fauna listed in **Table G 2**.

Measures to avoid and minimise impacts

The access point and access track have been located to ensure that the approved overhead and underground transmission line for Gregadoo Solar Farm can be constructed and maintained without adverse impacts to Boiling Down Creek or the adjoining riparian corridor. The access point and access track has been designed to avoid tree removal and subsequently impacts to Vegetation Zone 1.

Remaining works are requirements for the road upgrade and were assessed to allow for consideration of the likely extent of impacts associated with Over Size Over Mass (OSOM) vehicle movements. Avoidance measures were considered, and impact areas sited to limit tree removal for these works.

The measures described above also apply to minimising the prescribed impacts to habitat connectivity and appropriate crossings will be constructed over the ephemeral drainage line to assist in avoiding and minimising impacts to water quality and hydrological processes.

Impact assessment

EXCLUDED IMPACTS

Clause 6.8(3) of the BC Act specifies that the BAM is to exclude the assessment of the impacts of any clearing of native vegetation and loss of habitat on category 1-exempt land (as defined in Part 5A of *the Local Land Services Act 2013* [LLS Act]), other than prescribed impacts (as defined in clause 6.1 of the *Biodiversity Conservation Regulation 2017* [BC Regulation]). Vegetation Zone 2 has been assessed as aligning with category 1-exempt land as defined by the LLS Act and therefore this BDAR does not assess biodiversity values for native vegetation and loss of habitat on Vegetation Zone 2 (category-1 exempt land) other than prescribed impacts.

DIRECT IMPACTS

Primary and direct impacts of the proposal are the loss of native vegetation and associated habitats within the subject land. The total direct impacts to PCT 76 and consequently the Inland Grey Box Woodland EEC is expected to be up to 0.51 ha of degraded and mostly modified grassland consisting of some minor scattered native understory plants. It also includes direct impacts to PCT 277 and consequently the Box Gum Woodland CEEC (BC Act) is expected to be up to 0.0268 ha of modified grassland and planted native overstory vegetation (non-PCT associated species). The total clearing of vegetation from within the subject land equates to up to 0.5368 ha.

INDIRECT IMPACTS

Likely indirect impacts associated with the proposed development have been identified which include related activities not associated with clearing for the development footprint. These impacts may potentially have an effect on the remaining vegetation in the subject land and adjacent land/vegetation, including the Inland Grey Box Woodland EEC, Box Gum Woodland CEEC and associated threatened species, and habitats. A list of identified indirect impacts is displayed in **Section 8.1.2** of this report, with key examples including:

- inadvertent impacts on adjacent habitat or vegetation,
- transport of weeds and pathogens from the site to adjacent vegetation,
- reduced viability of adjacent habitat due to edge effects, and
- reduced viability of adjacent habitat due to noise, dust, or light spill.

PRESCRIBED IMPACTS

Prescribed impacts have been identified and include impacts to/involving:

- human-made structures,
- habitat connectivity,
- clearing of non-native vegetation that is habitat for threatened species,
- waterbodies, water quality and hydrological processes, and
- vehicle strikes.

SERIOUS AND IRREVERSIBLE IMPACTS

The proposal will or may have an impact on the following entities at risk of a serious and irreversible impact (SAII):

- *Euphrasia arguta*, and
- 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.

Additional impact assessment provisions for entities at risk of an SAII have been addressed in **Section 9** of this report. As presented, it is unclear whether the proposal will impact the SAII *Euphrasia arguta*. Following targeted surveys, if this species is found to occur within these vegetation zones, refinement and relocation of impact areas of the proposal will be required to avoid a chance of any serious and irreversible impact to this species. The proposal involves the removal of up to 0.027 ha of the Box Gum Woodland CEEC including up to four planted non-CEEC associated trees.

When assessing SSD, the decision maker is required to: take likely SAII into consideration and determine if there are any additional and appropriate measures that will minimise the impact if consent or approval is granted.

MEASURES TO MITIGATE IMPACTS

Where relocation or redesign is not possible, the proponent intends to develop a range of measures to mitigate the residual impacts of the proposal. This includes measures to be undertaken before, during, and after construction to minimise direct impacts of the proposal. Measures may include the preparation and implementation of:

- detailed environmental management plans (e.g., Construction Environmental Management Plan (CEMP), Biodiversity Management Plan (BMP), and other required management plans as directed by the conditions of consent), and
- provisions for clearing and construction including but not limited to delineation of clearing areas and protection zones; pre-clearing inspection; post-clearing assessment; erosion, sedimentation and pollution control; raising fauna awareness amongst employees; speed limits and potential fauna signage; rehabilitation of disturbed areas; and weed and pathogen management.

It is anticipated that mitigation measures will form part of the conditions of consent for the proposal and all measures will be approved or endorsed by the consent authority as part of the application process. Detailed plans will be provided post-approval.

ADAPTIVE MANAGEMENT

Adaptive management can be used to address impacts that are infrequent or difficult to measure. These include indirect or prescribed impacts, or other remaining biodiversity impacts.

Following approval and prior to construction, targeted surveys will be undertaken to determine presence (or absence) and if present, determine the extent (e.g., abundance, location for plants) of the following threatened flora species listed by NSW DCCEE as species at risk of serious and irreversible impacts:

- A Spear-grass (*Austrostipa wakoolica*),
- Small Scurf-pea (*Cullen parvum*), and
- *Euphrasia arguta*.

An unexpected threatened species finds procedure is to be followed in the event that a threatened species, or active breeding habitat of a threatened species is unexpectedly discovered during construction.

FINAL OFFSET REQUIREMENTS

As per BAM Subsection 9.2.1, offsets are required for impacts of the proposal in Vegetation Zone 3 and 4 as the associated vegetation integrity score is greater than 15 for each zone and the PCT within the subject land is representative of a TEC (**Table Exec 1**).

TABLE EXEC 1: IMPACTS THAT REQUIRE AN OFFSET – ECOSYSTEM CREDITS

Vegetation Zone	PCT ID	TEC	Impact area	Current VI score	Future VI score	Change in VI score	Biodiversity risk weighting	Number of ecosystem credits required
Zone 3	76	Inland Grey Box Woodland	0.01 ha	16.6	0	-16.6	2	1
Zone 4	277	Box Gum Woodland	0.007 ha	43.1	0	-43.1	2.5	1
Total Credits								2

Offsets are also required for impacts of the proposal on threatened species credit species present or assumed present within the subject land (**Table Exec 2**).

TABLE EXEC 2: IMPACTS THAT REQUIRE AN OFFSET – SPECIES CREDITS

Common name	Scientific name	BC Act status	EPBC Act status	Loss of habitat (ha)	Biodiversity risk weighting	Number of ecosystem credits required
Flora						
A Spear-grass	<i>Austrostipa wakoolica</i>	E	E	0.02	2	3
Small Scurf-pea	<i>Cullen parvum</i>	E	-	0.02	2	3
N/A	<i>Euphrasia arguta</i>	CE	CE	0.02	3	3
Fauna						
Key's Matchstick Grasshopper	<i>Keyacris scurra</i>	E	E	0.02	2	3
Barking Owl	<i>Ninox connivens</i>	V	-	0.02	2	3
Squirrel Glider	<i>Petaurus norfolcensis</i>	V	-	0.01	2	1
Squirrel Glider in the Wagga Wagga Local Government Area	<i>Petaurus norfolcensis – endangered population</i>	E	-	0.01	2	1
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	V	-	0.01	2	1
Koala	<i>Phascolarctos cinereus</i>	E	E	0.01	2	1
Golden Sun Moth	<i>Synemon plana</i>	V	V	0.02	1.5	3
Masked Owl	<i>Tyto novaehollandiae</i>	V	-	0.02	2	3

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Abbreviations

A00	Area of occupancy
AWS	Automatic Weather Station
BAM	Biodiversity Assessment Method
BAM-C	Biodiversity Assessment Method Calculator
BC Act	<i>Biodiversity Conservation Act 2016</i> (NSW)
BC Regulation	<i>Biodiversity Conservation Regulation 2017</i> (NSW)
BDAR	Biodiversity Development Assessment Report
BMP	Biodiversity Management Plan
BOAMS	Biodiversity Offsets and Agreement Management System
BOM	Bureau of Meteorology
BOS	Biodiversity Offsets Scheme
CEEC	Critically endangered ecological communities
CEMP	Construction Environmental Management Plan
Commonwealth DCCEEW	Commonwealth Department of Climate Change, Energy, Environment and Water
DA	Development Application
DAWE	Department of Agriculture, Water and the Environment (Commonwealth)
DBH	Diameter at breast height
DCS	Department of Customer Service
DNR	Department of Nature Resources (abolished in 2007)
DPE	Department of Planning and Environment (NSW) (renamed to DCCEEW in 2024)
DPIE	Department Of Planning, Industry & Environment (renamed to DPE in 2021)
DSEWP	Department of Sustainability, Environment, Water, Population and Communities (Commonwealth)
EOO	extent of occurrence
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i> (NSW)
EPBC	Environment Protection and Biodiversity Conservation
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
ESCP	Erosion and Sediment Control Plan
GDE	Groundwater Dependent Ecosystem
GIS	Geographic Information Systems
ha	hectares
IBRA	Interim Biogeographic Regionalisation for Australia
KBA	Key Biodiversity Areas (KBA)
KFH	Key Fish Habitat
km	kilometres
LEP	Local Environmental Plan
LGA	Local Government Area
LLS Act	<i>Local Land Services Act 2013</i> (NSW)
m	meters
MNES	Matters of National Environmental Significance
NSW	New South Wales
NSW DCCEEW	Department of Climate Change, Energy, Environment and Water (NSW)
OEH	Office of Environment and Heritage (NSW) (renamed to DPIE in 2019)
PBFD	Psittacine beak and feather disease
PCT	plant community type
PMST	Protected Matters Search Tool
SAII	serious and irreversible impact
SAT	Spot Assessment Technique
SPRAT	Species Profile and Threats Database
SSD	State Significant Development
SVTM	State Vegetation Type Map

TBDC	Threatened Biodiversity Data Collection
TEC	threatened ecological community
TSSC	Threatened Species Scientific Committee
VIS	Vegetation integrity Score

Declaration

i. Certification under clause 6.15 *Biodiversity Conservation Act 2016*

I certify that this report has been prepared based on the requirements of, and information provided under, the Biodiversity Assessment Method and clause 6.15 of the *Biodiversity Conservation Act 2016* (BC Act).

Signature: S. Vinson

Date: 27/09/2024

BAM Assessor Accreditation no: BAAS23004

This BDAR has been prepared to meet the requirements of BAM 2020. **Appendix A** provides an assessment of compliance with the minimum information requirements outlined in BAM Appendix K.

ii. Details and experience of author/s and contributors

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iii. Conflict of interest

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

This declaration has been made in the interests of full disclosure to the decision-maker. Full disclosure has also been provided to the client.

Signature: S. Vinson

Date: 27/09/2024

BAM Assessor Accreditation no: BAAS23004

Stage 1: Biodiversity Assessment

1. Introduction

1.1. Proposed development

1.1.1. DEVELOPMENT OVERVIEW

The proponent, also referred to as the client, intends to submit a modification application to the existing Development Approval for the State Significant Development (SSD) known as the Gregadoo Solar Farm (SSD 8825). The subject site is located at 123 Redband Road (Lot 11 DP 1043022) and 50 Ashfords Road (Lot 1 DP 524499), Gregadoo NSW 2650. This fourth modification aims to optimise the approved design and operations of the Gregadoo Solar Farm."

Optimised design

The optimised design has been conceived to utilise the approved development footprint more effectively by incorporating a Battery Energy Storage System (BESS) while maintaining a power output of 65 MW(AC). The proposed BESS will have a generation capacity of 200MWAC and 400MWh. This optimisation will ensure the orderly and economic use of land, while assisting to achieve State and Federal renewable energy targets and objectives for renewable energy and grid firming.

Additional access point and internal access track

Modification 4 also seeks to include an additional access point and internal access track from Boiling Down Road to the approved overhead transmission line between the Gregadoo Solar Farm substation and the Transgrid substation. The access point and access track are required to ensure that the approved overhead and underground transmission line can be constructed and maintained without adverse impacts to Boiling Down Creek or the adjoining riparian corridor.

Boiling Down Road approved access

Additionally, conditions of the approved Gregadoo Solar Farm identify that all over-dimensional and heavy vehicles associated with the development must travel to and from the site via the approved site access point off Boiling Down Road, and that the site access point off Boiling Down Road must be upgraded with a Rural Property Access type treatment to cater for the for the largest vehicle accessing the site. While the upgrade of the site access point off Boiling Down Road is approved, Modification 4 also provides additional assessment to confirm the likely extent of impact associated with Over Size Over Mass (OSOM) vehicle movements.

The approved Gregadoo Solar Farm is classified as SSD under the State and Regional Development, State Environmental Planning Policy (SEPP). As required by the Secretary's Environmental Assessment Requirements (SEARs), a Biodiversity Development Assessment Report (BDAR) was prepared by NGH Environmental that assessed the impacts of Gregadoo Solar Farm using the Biodiversity Assessment Methodology (BAM). The BDAR was approved and incorporated into condition 12 of the development consent (SSD 8825) and the project was approved on 11 December 2018.

The proposed modification involves works both within and outside the approved Gregadoo Solar Farm development footprint. This BDAR is a separate assessment under the BAM which only applies to the areas outside the approved development footprint which relate to:

- the construction and operation of an additional access point and internal access track from Boiling Down Road to the approved overhead transmission line between the Gregadoo Solar Farm substation and the Transgrid substation, and

- the likely extent of impact associated with Over Size Over Mass vehicle movements at the approved site access point off Boiling Down Road as well as Bakers Lane, and Ashfords Road intersections.

While Over Size Over Mass vehicle movements to the site are approved, additional assessment has been undertaken to confirm the likely extent of impact associated with requirements for temporary hardstand.

1.1.2. LEGISLATIVE PATHWAY

A BDAR is a requirement of the application for development consent of SSD under Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) and assessment under the NSW *Biodiversity Conservation Act 2016* (BC Act). This report has been prepared to address Stage 1 and 2 of the BAM 2020 and provides an assessment of the biodiversity values of the investigation area and assessment of impacts of the proposed modification. This BDAR has been prepared in accordance with Part 7 of the BC Act. Specifically, under:

- Section 7.9: an application for development consent under Part 4 of the EP&A Act for SSD is to be accompanied by a biodiversity development assessment report unless the Planning Agency Head and the Environment Agency Head determine that the proposed development is not likely to have any significant impact on biodiversity values.
- Section 7.14: an application for development consent for SSD under Part 4 of the EP&A Act, that is required under Division 2 to be accompanied by a biodiversity development assessment report. The Minister for Planning is to take into consideration under the EP&A Act, the likely impact of the proposed development on biodiversity values as assessed in the biodiversity development assessment report. If the Minister for Planning grants consent for the development, the conditions of the consent may require the applicant to retire biodiversity credits to offset the residual impact on biodiversity values.

The purpose of this report is to provide an assessment of the biodiversity values of the investigation area which comprises the subject land and assessment area (defined below) in the context of the BC Act. The BDAR needs to address impacts on biodiversity in accordance with the requirements of the BAM as required in the BC Act, including an assessment of serious and irreversible impacts (SAII) on relevant biodiversity values.

This BDAR also assesses Matters of National Environmental Significance (MNES) listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

1.1.3. LOCATION

The proposal site is located approximately 9 km southeast of the Wagga Wagga town centre at Lot 43 DP 1303215 (also known as 123 Redbank Road Wagga Wagga NSW) and Lot 1 DP 524499 (also known as 50 Ashford Road Wagga Wagga NSW), within the Wagga Wagga City Council (Council) Local Government Area (LGA) (**Figure 1** Error! Reference source not found. and **Figure 2**). Furthermore, there are multiple site locations for external required road upgrades. GPS co-ordinates in the centre of each site are as follows:

- Proposed internal access track: 35.200866S and 147.390368E,
- Boiling Down Road approved access: 35.2018S and 147.387234E,
- Ashfords Road intersection: 35.202631S 147.395563E, and
- Bakers Lane intersection: 35.15889S 147.414275E.

1.1.4. SUBJECT LAND AND ASSESSMENT AREA

The **subject land** (proposal site) and **assessment area** (1500 m buffer) are terms used to define specific areas of assessment for the purposes of this BDAR in accordance with the BAM. The extent of the subject land and assessment area can be found in **Figure 1** and **Figure 2** and descriptions are provided below.

1.1.4.1. SUBJECT LAND

The subject land consists of the development footprint for the proposed internal access road and road upgrade areas, as well as their immediate surrounds to account for biodiversity values that may be subject to direct, prescribed and indirect impacts resulting from the proposed modification.

The proposed internal access road is bounded by Boiling Down Road to the south, an electrical easement to the north, Wagga 330 KV Terminal Substation to the east and Boiling Down Creek to the west. The eastern and southern boundaries follow an existing fence line.

The Boiling Down Road access occurs within the existing road reserve and an area adjacent to the approved Gregadoo Solar Farm footprint. The other external road upgrade areas are situated within the road reserve at Ashfords Road and intersection Bakers Lane intersection. These areas of the subject land are bounded by adjoining lots or the road itself.

In its entirety, the subject land comprises approximately 3.41 ha and according to the current Wagga Wagga Local Environmental Plan (LEP) 2010 it:

- is zoned RU1 - Primary Production, and
- contains areas mapped for terrestrial biodiversity.

The subject land ranges from approximately 225 – 230 m in elevation, and in the proposed internal access, gently slopes towards the north. There is one artificial dam in the southeastern corner and one ephemeral drain line passing northwest through the subject land. The topography of the subject land means that any stormwater runoff from the subject land would most likely flow towards this drainage line and eventually offsite towards Boiling Down Creek to the west (see **Section 3.2.2**).

The land zoning within the subject land is RU1 - Primary Production under the current Wagga Wagga LEP 2010. This zoning covers the entire development site. The subject land is currently used for livestock (cattle) grazing and as a council managed road reserve. Existing structures within the subject land are limited to a barbed wire fence along the southern and eastern boundaries, a tower for the powerline easement in the northern section and both unsealed and sealed roadways.

Some surveys extended beyond the subject land to detect potential adjacent breeding habitat requiring buffer zones that may extend into the development footprint.

1.1.4.2. ASSESSMENT AREA

The assessment area includes the subject land and a 1500 m buffer surrounding the outside edge of the boundary of the subject land established using Geographic Information Systems (GIS) software. The assessment area is used predominately to identify a range of landscape features that may occur on the subject land or within the surrounding landscape. These features may contain biodiversity values that are important for:

- establishing the context of the subject land in relation to the surrounding area, and
- identifying the likely habitat suitability on the subject land for threatened entities.

Due to the addition of Bakers Lane intersection to the subject land, the assessment area is larger than conventional and consist of two separate 1.5 km buffer areas (**Figure 2**).

1.1.5. PROPOSED MODIFICATION

The proposed development (modification) for the purpose of this BDAR involves the construction and operation of:

- an additional access point and internal access track from Boiling Down Road to the approved overhead transmission line between the Gregadoo Solar Farm substation and the Transgrid substation, and
- required road upgrades for the surrounding roads which include sections of Bakers Lane, Ashfords Road and Boiling Down Road.

The new internal access road is approximately 370 m long, adjacent to the existing TransGrid substation and will connect the proposed overhead easement to Boiling Down Road. It is proposed to provide access for the construction of Gregadoo Solar Farm, then provide access to employees during operation of the solar farm. The new internal access road will be unsealed. The internal access road will include a splash crossing of the minor stream. The splash crossing will be designed in accordance with the Controlled activities – Guidelines for watercourse crossings on waterfront land (DPE, 2022)

While Over Size Over Mass (OSOM) vehicle movements to the site are approved, additional assessment has been undertaken to confirm the likely extent of impact associated with requirements for temporary hardstand.

Figure 4 displays the final development layout supplied by the proponent. **Figure 5:** Development footprint and **Figure** provide an overview of the development. Full detailed plans for the proposed development as supplied by the proponent are provided in **Attachment 1**.

1.2. Biodiversity Offsets Scheme entry

As described in **Section 1.1.2**, under section 7.9 and 7.14 of the BC Act, an application for SSD under Part 4 of the EP&A Act is to be accompanied by a BDAR and retirement of any biodiversity credits to offset the residual impact on biodiversity values. Residual impacts on biodiversity values have been assessed as occurring on category 1-exempt land as defined below. Therefore, while the proposed modification is to be assessed under the BAM and Biodiversity Offset Scheme (BOS), biodiversity credits are not generated in the BAM Calculator.

1.3. Excluded impacts

Clause 6.8(3) of the BC Act specifies that the BAM is to exclude the assessment of the impacts of any clearing of native vegetation and loss of habitat on category 1-exempt land (as defined in Part 5A of the *Local Land Services Act 2013* [LLS Act]), other than prescribed impacts (as defined in clause 6.1 of the *Biodiversity Conservation Regulation 2017* [BC Regulation]). In practice, this means impact assessment relating to vegetation integrity and habitat suitability are not required on category 1-exempt land, and biodiversity credits are not generated in the BAM Calculator (NSW DPE, 2022).

The LLS Act defines category 1-exempt land as areas of the State to which Part 5A applies. A native vegetation regulatory map that designates category 1-exempt land is being developed; however, it is currently under review and is not legally binding. Section 60F of the LLS Act provides transitional requirements which identify how the relevant categorisation of land is to be determined in the absence of a finalised native vegetation regulatory map. Accredited assessors may determine the categorisation of land during this transitional period in accordance with Section 60F of the LLS Act. Of relevance, the regulations may make further provision with respect to the application of Part 5A during the transitional period, including:

- provisions applying to the identification of low conservation value grasslands, and

- the preparation and publication of draft native vegetation regulatory maps for the purposes of the publication of maps at the end of the transitional period and the application of provisions of this Part in relation to those draft maps.

The draft native vegetation regulatory map (NSW DCCEEW, 2024a) has presented parts of the subject land and development footprint as category 1-exempt land (draft), with patches of category 2-regulated land (draft) (**Figure 3**). The presence of category 1-exempt land has been field validated using methods outlined in the *Interim Grasslands and other Groundcover Assessment Method Determining conservation value of grasslands and groundcover vegetation in NSW* (NSW DCCEEW, 2024b). In summary, the vegetation integrity score of 'Vegetation Zone 2' is less than 15 (see **Section 4.5**), which fulfills the criteria of 'low conservation value grasslands or groundcover' for application of category 1-exempt land.

The BAM does not assess biodiversity values for native vegetation and loss of habitat on category-1 exempt land other than prescribed impacts. Therefore the assessment of the impacts of any clearing of native vegetation and loss of habitat within 'Vegetation Zone 2' are excluded and presented in prescribed impacts (**Section 6** and **Section 8.3**). This BDAR still assesses vegetation integrity, habitat suitability to account for any potential for direct and indirect impacts associated with the development for all other vegetation zones.

1.4. Matters of national environmental significance

An Environment Protection and Biodiversity Conservation (EPBC) Protected Matters Search Tool (PMST) report was generated on 20 August 2024 (with a 10 km buffer around the subject land) to identify MNES that have the potential to occur within the development site (**Attachment 2**). Those relevant to biodiversity include:

- Wetlands of International Importance,
- Threatened Ecological Communities (TECs),
- Threatened species, and
- Listed migratory species.

The proposal has the potential to be deemed a 'controlled action' under Part 7 of the EPBC Act if it is determined that it is likely to have a significant impact on MNES.

An EPBC Act referral was made for Gregadoo Solar Farm ([EPBC Number: 2020/8643](#)). A decision was made by Commonwealth DCCEEW in June 2020 which states that the proposed activity is not a controlled action. The proposed modification will involve impacts to a small area of additional vegetation and habitat for EPBC Act listed entities which was not considered in the original decision.

The potential for MNES to occur on the subject land (**Appendix C**) are discussed in the sections below. Targeted surveys have been undertaken for some threatened entities protected under Commonwealth legislation to determine their presence within the subject land.

A Test of Significance has also been applied to determine the likelihood that the development may have a significant impact on MNES (**Appendix D** and **Appendix E**). Significant impact assessment undertaken to date has identified that the proposal should be referred to the Commonwealth Department of Climate Change, Energy, the Environment and Water (Commonwealth DCCEEW) for a binding decision on whether approval is required (see **Sections** Error! Reference source not found. and Error! Reference source not found. below for more detail).

1.4.1. WETLANDS OF INTERNATIONAL IMPORTANCE

The EPBC PMST report flags four wetlands of international importance, however, none occur within 10 km of the subject land, with the closest being over 400 km away.

1.4.2. THREATENED ECOLOGICAL COMMUNITIES

The EPBC PMST report identified three TECs, as listed under the EPBC Act:

- Grey Box Grassy Woodlands and Derived Native Grassland,
- Weeping Myall Woodlands, and
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

None of these TECs, as defined under the EPBC Act occur within the subject land for reasons discussed in **Appendix C**.

1.4.3. THREATENED SPECIES

The EPBC PMST report identified 43 threatened species, as listed under the EPBC Act. Of these, the following are considered to utilise or have potential to utilise habitat within the subject land:

- Critically Endangered:
 - *Euphrasia arguta*, and
 - Swift Parrot (*Lathamus discolor*).
- Endangered:
 - *Austrostipa wakoolica*,
 - Gang-gang Cockatoo (*Callocephalon fimbriatum*)
 - Spotted-tailed Quoll (*Dasyurus maculatus maculatus* [SE mainland population]),
 - Key's Matchstick Grasshopper (*Keyacris scurra*),
 - Pink Cockatoo (*Lophochroa leadbeateri leadbeateri*),
 - South-eastern Hooded Robin (*Melanodryas cucullata cucullata*), and
 - Koala (*Phascolarctos cinereus*).
- Vulnerable:
 - Southern Whiteface (*Aphelocephala leucopsis*),
 - South-eastern Glossy Black-Cockatoo (*Calyptorhynchus lathami lathami*),
 - White-throated Needletail (*Hirundapus caudacutus*),
 - Superb Parrot (*Polytelis swainsonii*),
 - Grey-headed Flying-fox (*Pteropus poliocephalus*)
 - Diamond Firetail (*Stagonopleura guttata*), and
 - Golden Sun Moth (*Synemon plana*).

The proposed modification will impact utilisable habitat for the above species, and a significant impact assessment following the Significant Impact Guidelines was undertaken (for full details see **Appendix E**) (DPE, 2013). Key results of that assessment are as follows.

There is scientific uncertainty about the impacts of the proposed modification, on *Euphrasia arguta*, and *Austrostipa wakoolica* and if present, the proposed modification has potential to have a significant impact on these species.

Furthermore, the proposed modification has potential to have a significant impact on:

- *Euphrasia arguta*,
- *Austrostipa wakoolica*,
- Key's Matchstick Grasshopper,

- South-eastern Hooded Robin,
- Southern Whiteface,
- Diamond Firetail, and
- Golden Sun Moth.

Significant impact assessment for some of the above species has followed the precautionary principle in that in the absence of targeted survey there is scientific uncertainty about the impacts of the proposal, and/or interpretation of the guidelines suggest any impacts to habitat (i.e., habitat critical to the survival) has the potential to be a significant impact.

1.4.4. MIGRATORY SPECIES

The EPBC PMST report identified nine migratory species, as listed under the EPBC Act. Of those species the following are considered to have potential to utilise habitat within (or above) the subject land:

- Fork-tailed Swift (*Apus pacificus*), and
- White-throated Needletail (*Hirundapus caudacutus*).

While the subject land may provide some transitory habitat for these species, the proposed modification is not likely to have a significant impact on these species (see **Appendix E**).

1.5. Information sources

Desktop research was undertaken to identify site characteristics, landscape context and threatened species and ecological communities known or likely to occur in or within 10 km of the subject land. The databases, resources and search tools included:

- Atlas of Living Australia;
- Biodiversity Assessment Method Calculator (BAM-C);
- Biodiversity Assessment Method Operational Manual Stage 1;
- Biodiversity Assessment Method Operational Manual Stage 2;
- Biodiversity Offsets and Agreement Management System (BOAMS);
- BioNet Atlas of NSW Wildlife;
- BioNet Threatened Biodiversity Data Collection (TBDC);
- BioNet Vegetation Classification;
- Commonwealth EPBC Act Protected Matters Search Tool;
- Directory of Important Wetlands in Australia;
- National Species Profiles and Threats (SPRAT) database;
- NSW and Commonwealth guidelines for targeted threatened species surveys;
- NSW Biodiversity Values Map;
- NSW eSpade soil and land information database;
- NSW Flora Online PlantNet;
- NSW Guidance on Serious and Irreversible Impacts (SAII);
- NSW Threatened Biodiversity Profile tool; and
- SEED environmental data portal.

Full citations of these sources can be found in **Section 12**.

2. Methods

2.1. Site context methods

2.1.1. LANDSCAPE FEATURES

2.1.1.1. DESKTOP ASSESSMENT

Landscape features were identified through a range of desktop methods and sources, which involved a review of both aerial imagery and spatial data.

2.1.1.2. FIELD ASSESSMENT

Field inspection was conducted on 12 – 13 March, and 5 – 7 August 2024 which involved walking the subject land and immediate surrounds to confirm the extent and condition of landscape features detailed in **Section 3.2**.

2.1.2. NATIVE VEGETATION COVER

2.1.2.1. DESKTOP ASSESSMENT

To investigate the extent of native vegetation cover of the subject land and assessment area GIS software was used combining the NSW State Vegetation Type Map (SVTM) dataset (NSW DCCEEW, 2022) and aerial photography images from:

- ESRI Satellite (ArcGIS/World Imagery) – ArcMaxar (Vivid) imagery, taken May 2022, and
- Google Satellite – taken February 2022.

Mapping for the original Gregadoo Solar Farm BDAR (NGH, 2018) was also taken into consideration.

2.1.2.2. FIELD ASSESSMENT

Field assessment within the subject land included a random meander traverse, full-floristic and vegetation integrity survey plots (BAM plots) to confirm the condition and extent of native vegetation across the subject land.

Field inspection of the broader assessment area (1.5 km buffer) was not entirely possible due to access issues as most of the assessment area occurs on private property. In this case aerial imagery was used and assumptions made for areas expected to be native vegetation and appearing to display native grassland, grassy woodlands, and other native trees (i.e. native forestry plantings).

2.1.2.1. MODIFICATION TO UNVALIDATED NATIVE VEGETATION MAPPING

The extent of native vegetation cover was modified from that mapped in the SVTM to:

- remove areas clearly not native vegetation (i.e., modified pastures, buildings, roads, and other structures); and
- add areas assumed to be native vegetation (i.e., grassland and grassy woodlands).

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

2.2.1. EXISTING INFORMATION

A review of the SVTM was undertaken to identify which Plant Community Types (PCTs) are currently mapped as occurring on the subject land and assessment area. This information was compared to field survey results and data filtered through the PCT filter tool within the NSW BioNet Vegetation Classification database to find the best fit PCT for the subject land. Identification of the most suitable PCT was determined based on bioregion and subregion, landscape position, geomorphology, vegetation class, vegetation type and structure, and species composition. The most appropriate PCT was selected and association with a TEC determined using relevant NSW and Commonwealth listing advice and guidelines.

2.2.2. MAPPING NATIVE VEGETATION EXTENT

Mapping native vegetation extent within the subject land involved a field assessment aimed at ground truthing the SVTM dataset. Ground truthing was undertaken via a series of random meander vegetation surveys conducted across the subject land.

2.2.3. PLOT-BASED VEGETATION SURVEY

Vegetation validation surveys were undertaken within the subject land by Simon Vinson, Senior Ecologist, and Finbar Shields, Ecologist on 12 and 13 March 2024. Follow up surveys were conducted by Finbar Shields on 6 August 2024. Vegetation validation surveys consisted of:

- utilising georeferenced mapping of the subject land and NSW SVTM data,
- a random meander across the subject land,
- recording flora species and composition within the subject land, and
- completion of three full floristic and vegetation integrity plots.

A total of three full-floristic vegetation plots were surveyed on 12 and 13 March 2024 to identify PCTs and potential TECs on the subject land. A follow up inspection on 6 August included a further three full-floristic vegetation plots and involved the collection of floristic data including:

- growth form,
- species name,
- cover, and
- abundance rating.

Locations of full-floristic vegetation plots for the purposes of identifying PCTs, and TECs were stratified and targeted to assess the expected environmental variation across the subject land.

Four vegetation zones were identified based on the broad condition of the canopy and groundcover layer of the PCTs identified on the subject land. Each zone was mapped using GIS software and the area size within the subject land was calculated.

A total of six full-floristic and vegetation integrity survey plots (BAM plots) were undertaken on the subject land to assess the composition, structure, and function components of each vegetation zone in accordance with the BAM.

A map of vegetation surveys including formal BAM plots can be found in **Figure 8**. Field data collected for BAM plots is included in **Appendix F** and flora and fauna species observed within the subject land in **Appendix G**.

2.3. Threatened flora survey methods

2.3.1. REVIEW OF EXISTING INFORMATION

An initial review of relevant databases, including the Commonwealth PMST, NSW BioNet Atlas of NSW Wildlife, and ALA records was undertaken to identify species likely to occur within the subject land, based on known records, geographic distribution, and predicted vegetation and habitat. Initial field data entered into the BAM-C automatically generated a list of threatened species predicted to occur within the subject land based on similar parameters and species associations with the identified PCT. Additional research utilising the TBDC refined predicted species based on habitat and microhabitat constraints to determine candidate species.

Aerial imagery and spatial datasets were also utilised in GIS software to confirm the extent of vegetation communities, habitat availability and patch size.

2.3.2. HABITAT CONSTRAINTS ASSESSMENT

Field assessment was undertaken to determine the presence of habitat constraints and microhabitats required for threatened flora species considered likely to occur on the subject land. This involved a traverse of the subject land with a focus on identification of areas containing or with potential to contain the following habitat constraints/microhabitat features:

- mostly native vegetation and floristic diversity,
- areas of moderate-high rock cover,
- undisturbed alluvial accumulations and plains,
- areas with the presence of cryptogams such as biofilm soil crusts, and/or
- areas of reduced grazing or protected from stock grazing.

2.3.3. TARGETED SURVEYS

Targeted surveys were conducted to determine the presence of candidate flora species credit species on 13 March, and 5 September 2024. Surveying and assessments of threatened species were undertaken by experienced and qualified ecologists with local knowledge of native and threatened flora in the region. Potential constraints of the studies have been recognised and dealt with through appropriate sampling design where possible, with any unavoidable constraints acknowledged as limitations, in which the precautionary principle would be adopted for assuming species presence.

Parallel field traverses were undertaken in accordance with relevant BAM and NSW government guidelines for surveying threatened plants and their habitats (NSW DPIE, 2020c). Traverses were recorded on a GPS device and extent of targeted surveys are shown in **Figure 8**. Further detail on the method of targeted surveys for threatened flora is provided in **Section 5.2**.

2.4. Threatened fauna survey methods

2.4.1. REVIEW OF EXISTING INFORMATION

Information from the TBDC was used to identify threatened fauna species that require assessment for the proposed development and to support the assessment of habitat suitability. This information was accessed through the BAM-C, including the suite of species that require assessment. Additional information about threatened species was reviewed to inform aspects of habitat suitability and as evidence of microhabitats depended on by a species. Additional information was reviewed from relevant sources as allowed by the BAM, including:

- BioNet (e.g., the profile of a threatened species),

- Important Area Map,
- Threatened Biodiversity Data Collection,
- National SPRAT database, and
- published, peer-reviewed literature.

2.4.2. FAUNA HABITAT ASSESSMENT

2.4.2.1. HABITAT CONSTRAINTS AND MICROHABITATS

A field assessment was undertaken to determine the presence of habitat and microhabitat constraints within the subject land for threatened fauna species considered likely to occur on the subject land. This involved traversing the subject land with surveys focusing on recording details, and active observation of any key habitat types including but not limited to:

- hollow-bearing trees and associated attributes such as size of hollows (diameter) and distance from the ground for each hollow,
- the extent and condition of riparian habitat, including waterways, water bodies and riparian vegetation,
- presence of stick nests (particularly focussing on presence of large stick nests for threatened raptors),
- presence of mistletoe, *Allocasuarina* and *Casuarina* species providing potential foraging resources for targeted threatened birds, and
- presence of flowering and fruiting trees providing potential foraging resources.

Field assessment also focused on assessing the broad vegetation condition across the subject land to determine the presence of habitat constraints and microhabitats threatened fauna species (likely to occur on the subject land) depend on.

2.4.1. FAUNA FIELD SURVEYS

Surveys were undertaken in March and August and comprised several approaches to detect potential threatened fauna species and their habitat, as described in **Table 1**. Surveys were conducted within the entire subject land with particular focus on habitat features and areas of suitable habitat for threatened species. Dates and weather conditions for each field survey and site inspection are outlined in **Table 2**. Details of specific surveys and results relating to species credit fauna species are provided in **Section 5.3**.

2.4.1.1. OPPORTUNISTIC SIGHTINGS

During all field surveys and site inspections, incidental information on fauna presence and activity was recorded through opportunistic sightings (including fauna identifiable by call). Evidence of fauna activity, such as scats, diggings, scratch marks, nests/dreys, burrows etc., was also noted.

TABLE 1: FIELD SURVEYS FOR THREATENED FAUNA

Survey type	Methods	Species targeted	
		Common name	Species name
Hollow bearing tree survey	Surveys were undertaken to identify all hollow bearing trees within the subject land, including recording the size (diameter) of each hollow and approximate distance from the ground.	Dusky Woodswallow	<i>Artamus cyanopterus cyanopterus</i>
		Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>
		South-eastern Glossy Black-Cockatoo	<i>Calyptorhynchus lathami lathami</i>
		Masked Owl	<i>Tyto novaehollandiae</i>
		Pink Cockatoo	<i>Lophochroa leadbeateri leadbeateri</i>
		Southern Whiteface	<i>Aphelocephala leucopsis</i>
		Superb Parrot	<i>Polytelis swainsonii</i>
		Yellow-bellied Sheathtail-bat	<i>Saccolaimus flaviventris</i>
Nocturnal fauna survey	Spotlighting was conducted across the subject land and consisted of a search of all trees and on the ground within the subject land using a spotlight. Attention was paid to hollow bearing trees, dams, and hydro lines as well as adjacent trees beyond the subject land. Spotlighting consisted of two people searching separately for one hour over one night (total of two person hours). Spotlighting surveys totalled up to 2 person hours (see Figure 14 for tracks).	Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>
		Koala	<i>Phascolarctos cinereus</i>
		Masked Owl	<i>Tyto novaehollandiae</i>
		Sloane's Froglet	<i>Crinia sloanei</i>
		Yellow-bellied Sheathtail-bat	<i>Saccolaimus flaviventris</i>
Stag-watching	Stag-watching consisted of observing the hollow bearing trees adjacent to the subject land. These hollow bearing trees were monitored for an hour on dusk for one night (total of two person hours).	Dusky Woodswallow	<i>Artamus cyanopterus cyanopterus</i>
		Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>
		South-eastern Glossy Black-Cockatoo	<i>Calyptorhynchus lathami lathami</i>
		Masked Owl	<i>Tyto novaehollandiae</i>
		Pink Cockatoo	<i>Lophochroa leadbeateri leadbeateri</i>
		Southern Whiteface	<i>Aphelocephala leucopsis</i>
		Superb Parrot	<i>Polytelis swainsonii</i>
		Yellow-bellied Sheathtail-bat	<i>Saccolaimus flaviventris</i>
Raptor nest searches	All trees within the subject land were searched for signs of large stick nests. Additionally, a search of the surrounding publicly accessible area for large stick nests was conducted to account for (where possible) related disturbance buffer zones and a more comprehensive understanding of local raptor breeding habitat.	Black Falcon	<i>Falco subniger</i>
		Little Eagle	<i>Hieraetus morphnoides</i>
		Spotted Harrier	<i>Circus assimilis</i>
Diurnal bird surveys	Opportunistic bird surveys were conducted during all field inspections. Diurnal surveys conducted at sunrise, throughout the day and sunset as to capture times of high bird behavioural activity and call activity. One dawn and one sunset survey conducted over 30 minutes were completed. Observations were also taken throughout most surveys in the middle of the day to target raptor species.	Black Falcon	<i>Falco subniger</i>
		Diamond Firetail	<i>Stagonopleura guttata</i>
		Dusky Woodswallow	<i>Artamus cyanopterus cyanopterus</i>
		Flame Robin	<i>Petroica phoenicea</i>
		Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>
		South-eastern Glossy Black-Cockatoo	<i>Calyptorhynchus lathami lathami</i>

Survey type	Methods	Species targeted	
		Common name	Species name
		Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>
		Hooded Robin (south-eastern form)	<i>Melanodryas cucullata cucullata</i>
		Little Eagle	<i>Hieraetus morphnoides</i>
		Little Lorikeet	<i>Glossopsitta pusilla</i>
		Scarlet Robin	<i>Petroica boodang</i>
		Speckled Warbler	<i>Pyrrholaemus sagittatus</i>
		Spotted Harrier	<i>Circus assimilis</i>
		Superb Parrot	<i>Polytelis swainsonii</i>
		Swift Parrot	<i>Lathamus discolor</i>
		Varied Sittella	<i>Daphoenositta chrysoptera</i>
		White-throated Needletail	<i>Hirundapus caudacutus</i>
Opportunistic invertebrate surveys	Careful searches for Key's Matchstick Grasshopper were also undertaken during general field surveys in March 2024. The field team shuffled through grassy areas, capturing and taking photos of invertebrates for later identification where possible.	Key's Matchstick Grasshopper	<i>Keyacris scurra</i>
Formal frog survey	Formal targeted surveys were completed for the Sloane's Froglet as to assess this species presence within the subject land. Potential habitat within the subject land, which included ephemeral hydro lines, dams and depression areas were surveyed during August. Surveys were conducted for approximately 2 hours each night after dark. They involved transversing potential habitat as well as aural (call-playback/listening to calls) and visual (spotlighting and active searches) observation. Incidental frog surveys were also undertaken during all site visits and surveys mentioned above.	Sloane's Froglet	<i>Crinia sloanei</i>

2.5. Weather conditions

Prevailing weather conditions during the surveys (highlighted) and during the lead-up to the surveys are presented in **Table 2**. The data was collated for the nearest Bureau of Meteorology (BoM) weather station (8.5 km away) at Wagga Wagga Aeronautical Meteorological Observer ([station 072150](#)) (BoM, 2024).

TABLE 2: ENVIRONMENTAL CONDITIONS DURING SURVEYS

Survey undertaken	Date	Temp. (min.)	Temp. (max.)	Wind gust (Max.)	Rainfall (mm)	Field noted conditions
N/A	9 Mar 2024	18.3	35.3	33	0	N/A
N/A	10 Mar 2024	18.8	34.5	28	0	N/A
N/A	11 Mar 2024	20	33.6	28	0	N/A
Random meander (opportunistic flora and fauna survey) BAM1 Stag-watching Nocturnal fauna survey Opportunistic invertebrate survey Diurnal bird survey	12 Mar 2024	17.3	36.8	30	0	Hot and mostly sunny
BAM2 BAM3 Hollow-bearing tree survey Raptor nest search Targeted flora survey (Parallel field traverse) Opportunistic invertebrate survey Diurnal bird survey	13 Mar 2024	20.1	36.4	37	0	Hot and mostly sunny
N/A	2 August 2024	- 1.6	15.8	20	0	N/A
N/A	3 August 2024	0.1	15.6	17	0	N/A
N/A	4 August 2024	1.8	15.2	15	0	N/A
Formal frog survey	5 August 2024	5.9	13.9	28	0	Overcast
Random meander (opportunistic flora and fauna survey) BAM4 BAM5 BAM6 Formal frog survey	6 August 2024	2.2	15.2	31	0.4	Mostly clear and sunny
Formal frog survey	7 August 2024	- 0.8	16.1	24	0	Mostly clear and sunny
Formal frog survey	8 August 2024	0.7	16.9	28	0	Mostly clear and sunny
N/A	2 September 2024	7.0	15.2	83	0	N/A
N/A	3 September 2024	-0.2	15.3	26	0	N/A
N/A	4 September 2024	1.0	20.0	33	0	N/A
Targeted flora survey (Parallel field traverse)	5 September 2024	6.6	23.7	43	0	Warm and mostly sunny

2.6. Limitations

The combination of habitat assessments and targeted surveys were utilised to determine the occurrence and likelihood of different species presence on the subject land. Habitat surveys were used to determine the quality and quantity of habitat that may be potentially suitable for various species. Conditions at the time of fieldwork were suitable to enable most plant species in the subject land to be identified with confidence. However, the results of fieldwork may not be conclusive as some plants and animals are only detectable at certain times of the year, or after particular weather events, and some species can only be identified to species level when in flower. Additionally, fauna fieldwork was not intended to produce a comprehensive survey of all animal species utilizing the subject land over time.

For determining presence of candidate threatened flora and fauna, surveys are used under the guidance of TBDC and published NSW and Commonwealth Guidelines. Targeted Surveys outline prescribed survey periods, methodology and considerations that need to be implemented to determine presence of identified threatened species within the subject land. Constraints on various aspects of these recommendations can lead to different limitations within an investigation, and can include;

- **Temporal limitations** to surveys which restrict survey application to a time of year when surveying is not recognised by the guidelines. In such cases the species is to be assumed as present unless otherwise justified;
- **Temporal limitations** that do not allow for long-term or on-going monitoring of the subject land, therefore reducing opportunities to observe cryptic species;
- **Limitations when conducting surveys simultaneously.** Targeted surveys for species with similar targeted survey methods were often conducted concurrently to ensure effective use of time. For example, targeted surveys for breeding habitat (large stick nests) were undertaken for Little Eagle and Square-tailed Kite simultaneously. This was considered appropriate without any significant limitation as further investigation would be undertaken to confirm the use of any identified habitat; and
- **Limitations in determining past or potential future use of sites, particularly for highly mobile or cryptic species.** The targeted surveying for all surveyed species is considered suitable for the subject land and extent of impacts of the proposed modification. Despite this, surveys cannot determine future use of the subject land by highly mobile or cryptic species.
- **Spatial limitations** to some vegetation integrity surveys that were conducted within the impact areas of road verges within the subject land. Due to the proximity of the road and the narrow width of the road verge two plots (BAM 4 and 5) were unable to be completed at the required size of 20 x 50 m. Despite this, they were recorded at such a size that they are considered to provide data and findings reflective of these areas. The surrounding landscape was surveyed, and it is believed that no further functional attributes e.g. fallen logs or native species would have been included if these plots were increased in size. Furthermore, these plots were unable to be completed at a greater length due to a differing vegetation zone on adjacent land.

3. Site context

3.1. Assessment area

The BAM assessment area is approximately 1720.93 ha and includes the subject land and the area of land within a 1500 m buffer zone surrounding the subject land (**Figure 2**). It is worth noting that the assessment area is larger than conventional due to the external road upgrade area at Bakers Lane, and consequently covers two separate 1500 m buffer zones.

3.2. Landscape features

Landscape features identified within the subject land and assessment area are shown on **Figure 1** and **Figure 2** respectively. A discussion of relevant landscape features is provided below.

3.2.1. IBRA BIOREGIONS AND IBRA SUBREGIONS

Under the Interim Biogeographic Regionalisation for Australia (IBRA v7), the subject land is located in the Inland Slopes Subregion within the South Western Slopes Region.

3.2.2. RIVERS, STREAMS, ESTUARIES AND WETLANDS

'Stream order' is used to describe the hierarchy of streams from the top to the bottom of a catchment. Using Hydro Line spatial data from the NSW Water Theme (DCS Spatial Services, 2021) and applying the Strahler system (Schedule 2 of the *Water Management (General) Regulation* 2018), the assessment area consists of 13 1st order, three 2nd order streams, three 3rd order stream, three 4th order streams and one 5th order stream (**Figure 2**).

While field validation of all waterways was not possible due to occurrence on private land, aerial imagery suggests the majority of Strahler streams described above are seasonally dried drainage lines fed through overflow of small, segregated farm dams, or modified as part of Council's stormwater infrastructure.

Boiling Down Creek flows into Coxs Creek approximately 850 m northeast from the proposed transmission access road, both of which occur within the assessment area. Coxs Creek then flows into Crooked Creek approximately 2 km northwest of the subject land, which eventually flows into Lake Albert 4 km northwest of the subject land.

The subject land itself contains an artificial farm dam and a 1st order stream as defined by the Strahler system. Field validation noted that this 1st order Strahler stream occurs as an ephemeral drainage line. Water drains through the northwest section of the subject land in a northerly direction, flowing into an artificial dam just outside the subject land with overflow into Boiling Down Creek ~240 m northwest of the subject land, towards Wagga Wagga and eventually into Crooked Creek (**Figure 2**).

3.2.3. HABITAT CONNECTIVITY

The subject land and assessment area are located on the outskirts of the urbanised and developed township of Wagga Wagga, within the historically modified rural agricultural land south of the township. The subject land itself is located within the same allotment as the Gregadoo Solar Farm approved development on private agricultural land currently used for livestock grazing. The assessment area provides valuable connectivity to different areas of habitat in the surrounding landscape that may serve as movement corridors for threatened ground dwelling, arboreal mammal, and aerial species. Riparian corridors as well as woodland and forested patches remain in the landscape providing habitat connectivity, particularly for highly mobile arboreal and aerial fauna. To break down habitat connectivity, three broad categories are defined and described below.

- **Riparian.** The assessment area contains Boiling Down Creek and Coxs Creek as well as consists of small, segregated dams along riparian courses not availing high quality connection

for riparian habitat. Boiling Down Creek flows 150 m west of the proposed transmission access road, providing potential connectivity with riparian vegetation throughout most of its occurrence. It eventually flows into Coxs Creek which provides less connectivity. Other riparian courses occurring within the assessment area flow through agricultural land, appearing to be ephemeral and are relatively disconnected due to the lack of native vegetation between them. Overall, there is moderate quality riparian habitat that provides sufficient connection to support populations of fauna requiring riparian habitat connectivity particularly through Boiling Down Creek and Coxs Creek.

- **Grassland.** Grasslands within the assessment area have been heavily modified for agricultural purposes and are relatively disconnected with roads and some residential structures. Overall, there appears to be limited connectivity for grassland specialist species.
- **Trees and midstory vegetation.** There are substantial patches of remnant woodland as well as planted vegetation that are connected to the surrounding landscape. They provide localised connectivity for arboreal mammals and birds to utilize hollow bearing trees, other large trees and shrubs for foraging and shelter. Though relatively degraded and sparse, the midstory and canopy vegetation across the landscape provides connectivity features for shelter and dispersal, particularly for arboreal mammals and bird species.

3.2.4. KARST, CAVES, CREVICES, CLIFFS, ROCKS, OR OTHER GEOLOGICAL FEATURES OF SIGNIFICANCE

No karsts, caves, crevices, large rocks, tors, or cliffs are known or were observed within the subject land or assessment area. No bush rocks or surface rocks were observed within the subject land.

3.2.5. AREAS OF OUTSTANDING BIODIVERSITY VALUE

No areas of outstanding biodiversity value, as identified under the BC Act, occur within the subject land and assessment area.

3.2.6. NSW (MITCHELL) LANDSCAPE

NSW (Mitchell) Landscapes were developed for conservation planning and reserve establishment purposes, to provide consistent state-wide ecological units finer than the existing bioregions and sub-regions (NSW DCCEEW, 2016). They group ecosystems into larger meso-ecosystems representing natural entities based on topography and geology, and each landscape's name includes both location and descriptive information.

The subject land occurs within the Murrumbidgee - Tarcutta Channels and Floodplains Mitchell Landscape Ecosystem detailed below (DCCEEW, 2002).

"Channels, floodplain and terraces of Murrumbidgee tributaries on Quaternary alluvium, general elevation 200 to 400m, local relief 25m. Undifferentiated organic sand and loam on the floodplain, brown gradational loam and yellow texture-contrast soils on higher terraces. River red gum (Eucalyptus camaldulensis) gallery woodland on banks, yellow box (Eucalyptus melliodora) and grey box (Eucalyptus microcarpa) open woodland on floodplain and terraces."

3.2.7. SOIL HAZARD FEATURES

The subject land is primarily not mapped as occurring on acid sulfate soils nor is mapped as having risk/probability of exhibiting occurrence of acid sulfate soils, however the Bakers Lane intersection site is mapped as low probability (**Figure 2**).

3.3. Native vegetation cover across assessment area

The extent of native vegetation in the subject land and assessment area was mapped using information provided in the original BDAR (NGH Environmental, 2018) as well as the NSW SVTM data (NSW DCCEEW, 2022).

Areas mapped as PCT 0: non-native vegetation in the NSW SVTM were removed, however edits were made to the layer where obvious changes to vegetation extent had occurred. Native vegetation cover across the assessment area was determined as both woody and non-woody vegetation, mostly grasslands and grassy woodlands. **Table 3** summarises the extent of native vegetation cover within the assessment area. **Figure 2** shows native vegetation cover within the assessment area.

TABLE 3: NATIVE VEGETATION COVER IN THE ASSESSMENT AREA

Assessment area (ha)	1720.93 ha
Total area of native vegetation cover (ha)	218.10 ha
Percentage of native vegetation cover (%)	12.67%
Class (0-10, >10-30, >30-70 or >70%)	>10 – 30

4. Native vegetation, threatened ecological communities and vegetation integrity

4.1. Native vegetation extent

The vegetation within the subject land contains native woodland including areas of both intact and cleared canopy with a varying composition of native and exotic understory. While exotic groundcover is abundant in most cleared areas, native grasses are scattered throughout, with 3.41 ha of the subject land being assessed as covered by native vegetation (**Figure 9**) as defined under the LLS Act.

4.1.1. CHANGES TO THE MAPPED NATIVE VEGETATION EXTENT IN SUBJECT LAND

The subject land has been assessed as containing a mixed assemblage of native and exotic vegetation. The NSW SVTM (NSW DCCEEW, 2022) initially used to determine native vegetation extent indicated areas within the subject land to be PCT 0: non-native vegetation (**Figure 7**). Ground truthing via a series of vegetation surveys determined that these areas were in some cases inaccurately mapped through the NSW SVTM and have been determined as native vegetation (due to some cover of native grasses).

4.2. Plant community types

4.2.1. OVERVIEW

Vegetation within the subject land has been assessed as aligning with the BioNet Vegetation Classification PCT 76 (**Photo 1**) and PCT 277 (**Photo 2**). Details of the two PCTs identified are presented in **Table 4** with extent shown in **Figure 10**. Detailed descriptions of the PCTs are provided in the following subsections.

TABLE 4: PCTs IDENTIFIED WITHIN THE SUBJECT LAND

PCT ID	PCT name	Subject land area
76	Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	3.30 ha
277	Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	0.11 ha
Total area		3.41 ha

4.2.2. PCT 76: WESTERN GREY BOX TALL GRASSY WOODLAND ON ALLUVIAL LOAM AND CLAY SOILS IN THE NSW SOUTH WESTERN SLOPES AND RIVERINA BIOREGIONS.

Table 5 presents the description and determination for PCT 76: Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions.

TABLE 5: PCT 76 DESCRIPTION AND DETERMINATION

PCT filter input and determination																	
Observed vegetation formation	Grassy Woodlands																
Vegetation class	Western Slopes Grassy Woodlands																
IBRA Region	South Western Slopes Region																
IBRA Sub-region	Inland Slopes																
Species used for PCT justification	<table border="1"> <thead> <tr> <th>Species name</th> <th>Estimated percentage cover (%)</th> </tr> </thead> <tbody> <tr> <td>Grey Box (<i>E. microcarpa</i>)</td> <td>10</td> </tr> <tr> <td>White Box (<i>E. albens</i>)</td> <td>10</td> </tr> <tr> <td>Ringed Wallaby Grass (<i>Rytidosperma caespitosum</i>)</td> <td>1</td> </tr> <tr> <td>Windmill Grass (<i>Chloris truncata</i>)</td> <td>1</td> </tr> <tr> <td>Red Grass (<i>Bothriochloa macra</i>)</td> <td>1</td> </tr> <tr> <td>Spear Grass (<i>Austrostipa scabra</i>)</td> <td>1</td> </tr> <tr> <td>Corrugated Sida (<i>Sida corrugata</i>)</td> <td>< 1</td> </tr> </tbody> </table>	Species name	Estimated percentage cover (%)	Grey Box (<i>E. microcarpa</i>)	10	White Box (<i>E. albens</i>)	10	Ringed Wallaby Grass (<i>Rytidosperma caespitosum</i>)	1	Windmill Grass (<i>Chloris truncata</i>)	1	Red Grass (<i>Bothriochloa macra</i>)	1	Spear Grass (<i>Austrostipa scabra</i>)	1	Corrugated Sida (<i>Sida corrugata</i>)	< 1
	Species name	Estimated percentage cover (%)															
	Grey Box (<i>E. microcarpa</i>)	10															
	White Box (<i>E. albens</i>)	10															
	Ringed Wallaby Grass (<i>Rytidosperma caespitosum</i>)	1															
	Windmill Grass (<i>Chloris truncata</i>)	1															
	Red Grass (<i>Bothriochloa macra</i>)	1															
	Spear Grass (<i>Austrostipa scabra</i>)	1															
Corrugated Sida (<i>Sida corrugata</i>)	< 1																
PCT filter outputs	<p>The study area's associated bioregion and the remnant understory and overstory species that are listed above were entered into the BioNet vegetation classification database and the top five results are listed below:</p> <ul style="list-style-type: none"> • PCT 3388 - Central West Valleys White Box Forest, • PCT 81 - Western Grey Box - Cypress Pine shrub grass tall woodland in the Brigalow Belt South Bioregion, • PCT 267 - White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion, • PCT 277 - Blakely's Red Gum - Yellow Box tall grassy woodland of the NSW Western Slopes, and • PCT 3396 - Northwest Slopes Box-Blakely's Red Gum Woodland. <p>Despite being not being in the first five (listed at eight), PCT 76 was determined to be the most closely aligned due to its overstory composition and landscape position. Whilst this PCT does not list White Box as a species in its upper stratum, the landscape position of the subject land and other floristic characteristics suggests this is the most aligned PCT for the area. The remainder of these PCTs mostly do not list the characteristic dominant overstory species of the subject land in their composition, or do not list these species at a similar dominance in cover. Furthermore, some of these PCTs occur more commonly on hilly landscapes or within a different bioregion.</p>																
State Vegetation Type Mapping	<p>The STVM identifies the following PCTs as present within 1 km or occurring within the study area:</p> <ul style="list-style-type: none"> • PCT 79 - River Red Gum shrub/grass riparian tall woodland or open forest wetland mainly in the upper slopes sub-region of the NSW South Western Slopes Bioregion and western South Eastern Highlands Bioregion, • PCT 74 - Yellow Box - River Red Gum tall grassy riverine woodland of NSW South Western Slopes Bioregion and Riverina Bioregion, • PCT 277 - Blakely's Red Gum - Yellow Box tall grassy woodland of the NSW Western Slopes, • PCT 319 - Tumbledown Red Gum - White Cypress Pine hill woodland in the southern part of the NSW South Western Slopes Bioregion. <p>Despite the STVM not identifying any PCT to be applicable to the subject land, remnant native vegetation suggests the subject land most closely aligns with PCT 76 - Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions</p>																
Justification	It has been determined that PCT 76 - Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions most appropriately meets the																

	observed characteristics of the community recorded within the subject land. This was determined by: <ul style="list-style-type: none"> • Matching vegetation formation, • Occurrence within IBRA region and IBRA sub-region, • Most closely aligned overstory composition, and • Landscape position and soil lithology. 	
Determined PCT		
Vegetation type	PCT ID	Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
	Common community 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	Western Slopes Grassy Woodlands
Percentage cleared (in NSW)	92.10	
PCT Description (BioNet)	<p>This community is characterised by a tall woodland to 25 m high dominated by Western Grey Box (<i>Eucalyptus microcarpa</i>) often as the only tree species often occupying 90% of the canopy cover. Other tree species may include Yellow Box (<i>E. melliodora</i>), White Cypress Pine (<i>Callitris glaucophylla</i>) and occasional Buloke (<i>Allocasuarina luehmannii</i>).</p> <p>The midstory vegetation is absent or sparse and includes Sticky Hop-bush (<i>Dodonaea viscosa</i>), Box-leaved Wattle (<i>Acacia buxifolia</i>), Hakea Wattle (<i>A. hakeoides</i>), Blackthorn (<i>Bursaria spinosa</i>).</p> <p>Ground layer vegetation typically includes a mid-dense to dense grass ground cover consisting commonly of the species Ringed Wallaby Grass (<i>Rytidosperma caespitosum</i>), Small-flowered Wallaby Grass (<i>R. setacea</i>), Spear Grass (<i>Austrostipa scabra</i>), Box Grass (<i>Paspalidium constrictum</i>), Kangaroo Grass (<i>Themeda triandra</i>), Brush Wiregrass (<i>Aristida behriana</i>) and Native Wheatgrass (<i>Anthosachne scaber</i>) often with introduced grass species such as Bromes (<i>Bromus</i> spp.), Fescue (<i>Vulpia</i> spp.) and Wheat Grass (<i>Hordeum leporinum</i>).</p> <p>The small scrambler Climbing Saltbush (<i>Einadia nutans</i> subsp. <i>nutans</i>) is usually present. Native forbs include Corrugated Sida (<i>Sida corrugata</i>), Bluebells (<i>Wahlenbergia gracilis</i>), Riverine Flax-lily (<i>Dianella porracea</i>), Woolly New Holland Daisy (<i>Vittadinia gracilis</i>), Wood-sorrel (<i>Oxalis perennans</i>) and Caustic Weed (<i>Chamaesyce drummondii</i>).</p> <p>This community occurs on texture contrast red earths, brown earths or grey clay soils (that may be gilgaied). Commonly on undulating alluvial plains in the predominantly winter rainfall belt of south-central western NSW, where average annual rainfall ranges between 550 and 450 mm. It's mainly restricted to the eastern section of the Riverina Bioregion and the western section of the NSW South-western Slopes Bioregion. Patches often have a reduce to removed shrub layer in many locations where grazing has been intense.</p> <p>This community grades into the shrubbier Western Grey Box-White Cypress Pine - Buloke community (ID80) on loamy-sandy soils and grades into a riverine Western Grey Box community (ID237) along the floodplains of the Murrumbidgee and Murray Rivers. This community has been largely cleared due to its occurrence on arable soils, with much of its remaining extent is threatened by grazing and weed invasion.</p>	
Condition (zones)	<p>This community occurs in the majority of the subject land and is present as a remnant woodland co-dominated by White Box and Grey Box and modified grassland. Despite the historic disturbance of understory vegetation, some remnant and disturbance tolerant species persist, particularly grasses (Photo 1).</p> <p>The condition of PCT 76 varied within the subject land and three vegetation zones were determined accordingly. Relative to benchmark, PCT 76 within the subject land was assigned conditions of moderate (Zone 1), low (Zone 2) and low-moderate (Zone 3) condition based on the broad condition of the canopy and groundcover layers as follows:</p> <ul style="list-style-type: none"> • Zone 1 – Remnant woodland with a mostly intact canopy and a ground layer mostly composed of exotic species and containing a low diversity and cover of native groundcover species. • Zone 2 – Modified grassland that is predominately exotic in composition but contains some native groundcover species. • Zone 3 – Derived native grassland which contains a mixed groundlayer composition of native and exotic species as well as minor overstory regeneration. <p>Zone 1 contains moderate condition native woodland vegetation with signs of long-term grazing, such as the almost entire removal of midstory vegetation. Despite this, it contains a range of overstory tree classes including mature trees, many hollow-bearing, and regeneration. Understory vegetation is mostly exotic in composition, however, retains a moderate diversity of native forbs and grasses.</p>	

	<p>Zone 2 has been entirely cleared of overstory and midstory vegetation. It contains modified grassland present in Zone 1 vegetation. This grassland vegetation is largely exotic in composition, however, retains a low cover and low-moderate diversity of native groundcover species such as Corrugated Sida (<i>Sida corrugata</i>), Tarvine (<i>Boerhavia dominii</i>), Spear Grass (<i>Austrostipa scabra</i>) and Wallaby Grasses (<i>Rytidosperma</i> spp.).</p> <p>Zone 3 is present as a roadside verge and contains a low-moderate diversity of groundlayer species, particularly native grasses such as Tall Speargrass (<i>Austrostipa bigeniculata</i>), Wallaby Grasses, Wattle Mat-rush (<i>Lomandra filiformis</i>) and Common Couch (<i>Cynodon dactylon</i>). This zone also contains small amounts of Grey Box (<i>E. microcarpa</i>) regeneration.</p> <p>All zones have been assessed as meeting the definition of PCT 76.</p>
TEC status (BC Act)	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions (Endangered).
TEC status (EPBC Act)	Grey Box (<i>Eucalyptus microcarpa</i>) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia (Endangered).

PHOTO 1: PCT 76 WESTERN GREY BOX TALL GRASSY WOODLAND ON ALLUVIAL LOAM AND CLAY SOILS IN THE NSW SOUTH WESTERN SLOPES AND RIVERINA BIOREGIONS



4.2.3. PCT 277: BLAKELY'S RED GUM - YELLOW BOX GRASSY TALL WOODLAND OF THE NSW SOUTH WESTERN SLOPES BIOREGION

Table 6 presents the description and determination for PCT 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion.

TABLE 6: PCT 277 DESCRIPTION AND DETERMINATION

PCT filter input and determination															
Observed vegetation formation	Grassy Woodlands														
Vegetation class	Western Slopes Grassy Woodlands														
IBRA Region	South Western Slopes Region														
IBRA Sub-region	Inland Slopes														
Species used for PCT justification	<table border="1"> <thead> <tr> <th>Species name</th> <th>Estimated percentage cover (%)</th> </tr> </thead> <tbody> <tr> <td>Tall Speargrass (<i>Austrostipa bigeniculata</i>)</td> <td>< 1</td> </tr> <tr> <td>Wallaby Grasses (<i>Rytidosperma</i> spp.)</td> <td>< 1</td> </tr> <tr> <td>Corrugated Sida (<i>Sida corrugata</i>)</td> <td>< 1</td> </tr> <tr> <td>Red Grass (<i>Bothriochloa macra</i>)</td> <td>< 1</td> </tr> <tr> <td>Fuzzweed (<i>Vittadinia cuneata</i>)</td> <td>< 1</td> </tr> <tr> <td>Windmill Grass (<i>Chloris truncata</i>)</td> <td>< 1</td> </tr> </tbody> </table>	Species name	Estimated percentage cover (%)	Tall Speargrass (<i>Austrostipa bigeniculata</i>)	< 1	Wallaby Grasses (<i>Rytidosperma</i> spp.)	< 1	Corrugated Sida (<i>Sida corrugata</i>)	< 1	Red Grass (<i>Bothriochloa macra</i>)	< 1	Fuzzweed (<i>Vittadinia cuneata</i>)	< 1	Windmill Grass (<i>Chloris truncata</i>)	< 1
	Species name	Estimated percentage cover (%)													
	Tall Speargrass (<i>Austrostipa bigeniculata</i>)	< 1													
	Wallaby Grasses (<i>Rytidosperma</i> spp.)	< 1													
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	Fuzzweed (<i>Vittadinia cuneata</i>)	< 1													
Windmill Grass (<i>Chloris truncata</i>)	< 1														
PCT filter outputs	<p>The subject land's associated bioregion and the remnant understory and overstory species that are listed above were entered into the BioNet vegetation classification database and the top five results are listed below:</p> <ul style="list-style-type: none"> • PCT 267 – White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion, • PCT 276 - Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion, • PCT 277 - Blakely's Red Gum – Yellow Box tall grassy woodland of the NSW Western Slopes • PCT 3396 - Northwest Slopes Box-Blakely's Red Gum Woodland, and • PCT 201 - Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion. <p>PCT 277 is the third listed community and was determined to be the most closely aligned of the filter options due to its remnant groundcover species composition and landscape position. While overstory cover was not present within the subject land, the presence of Blakely's Red Gum and Yellow Box in the surrounding landscape support the presence of this community. The majority of the above listed PCTs mostly do not list the characteristic dominant overstory species of PCT 277 in their composition, or do not list these species at a similar dominance in cover. Furthermore, some of these PCTs occur more commonly on different landscapes such as hills or in a different sub-region.</p>														
State Vegetation Type Mapping	<p>The STVM identifies the following PCTs as present within 1 km or occurring within the subject land:</p> <ul style="list-style-type: none"> • PCT 79 – River Red Gum shrub/grass riparian tall woodland or open forest wetland mainly in the upper slopes sub-region of the NSW South Western Slopes Bioregion and western South Eastern Highlands Bioregion, • PCT 74 – Yellow Box – River Red Gum tall grassy riverine woodland of NSW South Western Slopes Bioregion and Riverina Bioregion, • PCT 277 - Blakely's Red Gum – Yellow Box tall grassy woodland of the NSW Western Slopes, • PCT 319 - Tumbledown Red Gum - White Cypress Pine hill woodland in the southern part of the NSW South Western Slopes Bioregion. <p>The STVM identifies PCT 277 as occurring within 1 km of the subject land. The surrounding landscape overstory composition and remnant ground layer species of the subject land align most closely with this PCT. The other suggest STVM PCTs do not present an overstory composition that</p>														

	aligns with the subject land or these PCTs occur on a different landscape position e.g. PCT 319 and PCT 79.	
Justification	<p>It has been determined that PCT 277 – Blakely’s Red Gum – Yellow Box tall grassy woodland of the NSW Western Slopes most appropriately meets the observed characteristics of the community recorded within the subject land. This was determined by:</p> <ul style="list-style-type: none"> • Matching vegetation formation, • Occurrence within IBRA region and IBRA sub-region, • Matching overstorey composition (in the surrounding landscape), • Matching remnant ground layer composition 	
Determined PCT		
Vegetation type	PCT ID	277
	Common community name	Blakely’s Red Gum – Yellow Box tall grassy woodland of the NSW Western Slopes
	Vegetation formation	Grassy Woodlands
	Vegetation class	Western Slopes Grassy Woodlands
Percentage cleared (in NSW)	94	
PCT Description (BioNet)	<p>This community is characterised by a tall woodland to about 20 m high and dominated by Blakely’s Red Gum (<i>Eucalyptus blakelyi</i>) and Yellow Box (<i>Eucalyptus melliodora</i>). Blakely’s Red Gum or Yellow Box vary in their dominance and either can be absent in some places where this community grades into areas a greater cover of Apple Box (<i>Eucalyptus bridgesiana</i>), Long-leaved Box (<i>Eucalyptus goniocalyx</i>) and rarely Grey Box (<i>Eucalyptus microcarpa</i>)</p> <p>Midstorey vegetation is often sparse or absent and may include shrubs such as Silver Wattle (<i>Acacia dealbata</i>).</p> <p>Ground cover may range from dense to sparse depending on rainfall and is usually dominated by grass species such as Snow Grass (<i>Poa sieberiana</i>), Red Grass (<i>Bothriochloa macra</i>), Purple Wiregrass (<i>Aristida ramosa</i>), Kangaroo Grass (<i>Themeda triandra</i>), Wallaby Grasses (<i>Rytidosperma</i> spp.) and Spear Grasses (<i>Austrostipa</i> spp.). Forb species typically include Fuzzweed (<i>Vittadinia cuneata</i>), Common Everlasting (<i>Chrysocephalum apiculatum</i>) and Corrugated Sida (<i>Sida corrugata</i>).</p> <p>This community is very widespread on fertile deep, loam or clay soils derived from a range of substrates which include fine-grained sedimentary and metamorphic rocks, but also volcanics and fine-grained granite. It occurs on flats, footslopes and hillslopes mainly in the upper slopes sub-region of the NSW South-western Slopes Bioregion and to the east of Wagga Wagga.</p> <p>This community grades into White Box (<i>Eucalyptus albens</i>) grassy woodland (ID266) on hillslopes and into either Western Grey Box woodland (ID76) or Yellow Box woodland (ID276) on parna or alluvial flats. It has been largely cleared within the landscape and is further subjected to nutrification from fertilizers and associated weed invasion.</p> <p>This community occurs on some roadside verges and the plantation of the subject land. Within the plantation it occurs as a sparse groundcover mostly including associated grass species and occasional forbs. On roadside verges of the subject land, it is not present as a woodland, how instead as a modified grassland due to the extent of its clearing, containing only few native groundcover species.</p>	
Condition (zones)	<p>The condition of PCT 277 varied across the subject land and two vegetation zones were determined accordingly. Relative to benchmark, PCT 277 within the subject land was assigned conditions from moderate (Zone 4) to low (Zone 5) condition based on the broad condition of the canopy and groundcover layers as follows:</p> <ul style="list-style-type: none"> • Zone 4 – Planted vegetation composed of a planted overstorey of mostly non-endemic species and containing a low diversity and cover of native groundcover species. • Zone 5 – Modified grassland that is predominately exotic in composition and contains few native groundcover species. <p>Zone 4 contains moderately dense planted overstorey native vegetation, the majority of which are species that do not naturally occur in the area and includes primarily eucalypts and some wattles. Some naturally occurring species such as Red Box (<i>Eucalyptus polyanthemus</i>) are present though. Midstorey vegetation is largely absent from this zone, with the exception of some regeneration</p>	

	<p>Bottlebrush (<i>Callistemon</i> sp.). The groundlayer is sparse to moderate and is composed of a mix of native and exotic species. The dominant native species include Speargrasses (<i>Austrostipa</i> spp.), Wallaby Grasses, Common Couch, Windmill Grass (<i>Chloris truncata</i>) and Red Grass (<i>Bothriochloa macra</i>). Exotic species largely consist of pasture grasses such as Broome (<i>Bromus</i> sp.) and broadleaved forbs such as Capeweed (<i>Arctotheca calendula</i>) and Patterson's Curse (<i>Echium plantagineum</i>). The groundlayer contains a high cover of leaf litter and also areas of coarse woody debris.</p> <p>Zone 5 is primarily exotic in composition and does not contain either a native midstory or canopy. It largely consists of exotic understory vegetation, most of which are considered pasture grasses or invasive grasses. The dominant species include Brome (<i>Bromus</i> spp.), African Lovegrass (<i>Eragrostis curvula</i>), Paspalum (<i>Paspalum dilatatum</i>) and Ryegrass (<i>Lolium</i> spp.). Very minor native species cover is present, this includes species of native grass such as Wallaby Grass and Speargrass.</p> <p>Both zones have been assessed as meeting the definition of PCT 277.</p>
TEC status (BC 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 (Critically Endangered).
TEC status (EPBC Act)	White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Critically Endangered).

PHOTO 2: PCT 277 BLAKELY'S RED GUM – YELLOW BOX TALL GRASSY WOODLAND OF THE NSW WESTERN SLOPES



4.3. Vegetation zones

Based on the broad condition state of the PCTs, a total of five vegetation zones were identified in the subject land. Six vegetation integrity survey plots were collected, consistent with the BAM subsection 4.3.1. Descriptions of each vegetation zone are provided below and summarised in **Photo 5: PCT 76 – Zone 3**

Photo 6: PCT 277 – Zone 4

PHOTO 7: PCT 277 – ZONE 5

- Zone 1: PCT 76 Remnant woodland with a mostly intact canopy and a ground layer mostly composed of exotic species and containing a low diversity and cover of native groundcover species (**Photo 3**).
- Zone 2: PCT 76 Modified grassland that is predominately exotic in composition though contains some native groundcover species (**Photo 4**).
- Zone 3: PCT 76 Derived native grassland that contains a mixed composition of ground layer native and exotic species as well as some overstory regeneration (**Photo 5**).
- Zone 4: PCT 277 Planted vegetation composed of a planted overstory of mostly non-endemic species and containing a low diversity and cover of native groundcover species (**Photo 6**).
- Zone 5: PCT 277 Modified grassland that is predominately exotic in composition and contains few native groundcover species (**Photo 7**).

Patch sizes were determined for all zones based on definitions in the BAM subsections 3.3.3. and 4.3.2. i.e.:

“A patch is an area of native vegetation that occurs on the subject land and includes native vegetation that has a gap of less than 100 metres from the next area of native vegetation (or ≤ 30 m for non-woody ecosystems). The patch may extend onto land adjoining the subject site.”

Patch size was determined based on field observation and plot data, and analysis of spatial data and aerial imagery. Patch size class for each zone is presented in **Table 7**. The majority of the development footprint contains vegetation from Zone 2 (category 1-exempt land), with some impacts to Zones 3, 4 and 5. Vegetation Zone 1 was assessed further to account for any indirect impacts attributed to the proposed modification and inform proposed avoid, minimise, and mitigate options.

PHOTO 3: PCT 76 - ZONE 1



PHOTO 4: PCT 76 - ZONE 2



PHOTO 5: PCT 76 - ZONE 3



PHOTO 6: PCT 277 - ZONE 4



PHOTO 7: PCT 277 – ZONE 5



TABLE 7: VEGETATION ZONES AND PATCH SIZES

Vegetation Zone ID	PCT ID number and name	Condition / other defining feature	Subject land Area (ha)	Patch size class	No. vegetation integrity plots required	No. vegetation integrity plots completed	No. vegetation integrity plots used in assessment	Plot IDs of vegetation integrity plots used in assessment
Zone 1	PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions.	Moderate, woodland.	0.30	<input type="checkbox"/> <5 ha <input type="checkbox"/> 5–24 ha <input type="checkbox"/> 25–100 ha <input checked="" type="checkbox"/> >100 ha	1	1	1	BAM1
Zone 2	PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions.	Low. Mostly exotic grassland.	2.97	<input type="checkbox"/> <5 ha <input type="checkbox"/> 5–24 ha <input type="checkbox"/> 25–100 ha <input checked="" type="checkbox"/> >100 ha	2	2	2	BAM2 BAM3
Zone 3	PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions.	Low. Derived native grassland.	0.03	<input type="checkbox"/> <5 ha <input type="checkbox"/> 5–24 ha <input type="checkbox"/> 25–100 ha <input checked="" type="checkbox"/> >100 ha	1	1	1	BAM5
Zone 4	PCT 277 Blakely's Red Gum – Yellow Box tall grassy woodland of the NSW Western Slopes	Moderate, woodland.	0.03	<input type="checkbox"/> <5 ha <input type="checkbox"/> 5–24 ha <input type="checkbox"/> 25–100 ha <input checked="" type="checkbox"/> >100 ha	1	1	1	BAM4
Zone 5	PCT 277 Blakely's Red Gum – Yellow Box tall grassy woodland of the NSW Western Slopes	Low. Mostly exotic grassland.	0.08	<input type="checkbox"/> <5 ha <input type="checkbox"/> 5–24 ha <input type="checkbox"/> 25–100 ha <input checked="" type="checkbox"/> >100 ha	1	1	1	BAM6

4.4. Threatened ecological communities

As justified below TECs identified within the subject land are listed in **Table 8** and their extent is shown in **Figure 12**.

TABLE 8: TECs WITHIN THE SUBJECT LAND

TEC name	Profile ID (from TBDC)	BC Act status	EPBC Act status	Associated Vegetation Zones	Area within subject land
Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Penepplain, Nandewar and Brigalow Belt South Bioregions	20072	Endangered Ecological Community	Not listed	Zone 1	0.30
				Zone 2	2.97
				Zone 3	0.03
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	10837	Critically Endangered Ecological Community	Not listed	Zones 4	0.03
				Zone 5	0.08

4.4.1. ALIGNMENT WITH BC ACT LISTED ECOLOGICAL COMMUNITIES

4.4.1.1. INLAND GREY BOX WOODLAND

PCT 76: Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina is associated with the NSW BC Act listed, Endangered Ecological Community (EEC) commonly known as Inland Grey Box Woodland and is listed as follows:

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

The subject land is situated within the known geographic distribution area for the EEC in the NSW South Western Slopes South Bioregion, and site characteristics meet the definition of the EEC.

NSW DCEEW, Threatened Species Profile and Threatened Species Scientific Committee (NSW TSSC) determination (2011) describes the *Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Penepplain, Nandewar and Brigalow Belt South Bioregions* community as:

“Woodlands in which the most characteristic tree species, Eucalyptus microcarpa (Inland Grey Box), is often found in association with E. populnea subsp. bimbil (Bimble or Poplar Box), Callitris glaucophylla (White Cypress Pine), Brachychiton populneus (Kurrajong), Allocasuarina luehmannii (Bullock) or E. melliodora (Yellow Box), and sometimes with E. albens (White Box). Shrubs are typically sparse or absent, although this component can be diverse and may be locally common, especially in drier western portions of the community. A variable ground layer of grass and herbaceous species is present at most sites. At severely disturbed sites the ground layer may be absent. The community generally occurs as an open woodland 15–25 m tall but in some locations the overstorey may be absent as a result of past clearing or thinning, leaving only an understorey

The majority of remnant patches of Inland Grey Box Woodland survive with trees largely intact but with the shrub or ground layers degraded to varying degrees through grazing or pasture modification. Some species that are part of the community appear intolerant to heavy grazing by domestic stock and are confined to the least disturbed remnants.”

Based on the NSW DCEEW description of the EEC, and comparison to our observations and plot data, it is determined that Vegetation Zones 1, 2 and 3 within the subject land meet the definition of the *Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Penepplain, Nandewar and Brigalow*

Belt South Bioregions TEC. Condition classes for the EEC are consistent with zone delineation and descriptions detailed in **Section 4.2.3**.

4.4.1.2. BOX GUM WOODLAND

PCT 277: Blakely's Red Gum – Yellow Box tall grassy woodland of the NSW Western Slopes is associated with the NSW BC Act listed, Critically Endangered Ecological Community (CEEC) commonly known as Box Gum Woodland and listed as follows:

- 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.

The subject land is situated within the known geographic distribution area for the CEEC in the NSW South Western Slopes South Bioregion, and site characteristics meet the definition of the CEEC.

NSW DCEEW, Threatened Species Profile and Threatened Species Scientific Committee (NSW TSSC) determination (2020) describes Box Gum Woodland as:

“An open woodland community (sometimes occurring as a forest formation), in which the most obvious species are one or more of the following: White Box Eucalyptus albens, Yellow Box E. melliodora and Blakely's Red Gum E. blakelyi. Intact sites contain a high diversity of plant species, including the main tree species, additional tree species, some shrub species, several climbing plant species, many grasses and a very high diversity of herbs. The community also includes a range of mammal, bird, reptile, frog and invertebrate fauna species. Intact stands that contain diverse upper and mid-storeys and ground layers are rare. Modified sites include the following:

- *Areas where the main tree species are present ranging from an open woodland formation to a forest structure, and the groundlayer is predominantly composed of exotic species; and*
- *Sites where the trees have been removed and only the grassy groundlayer and some herbs remain.”*

Based on the NSW DCCEEW description of the CEEC, and comparison to our observations and plot data, it is determined that Vegetation Zones 4 and 5 within the subject land meet the definition of Box Gum Woodland TEC. Condition classes for the EEC are consistent with zone delineation and descriptions detailed in **Section 4.2.3**.

4.4.2. ALIGNMENT WITH EPBC ACT LISTED ECOLOGICAL COMMUNITIES

4.4.2.1. INLAND GREY BOX WOODLAND

PCT 76: Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina is associated with the EEC, commonly known as Grey Box Woodland, and listed under the EPBC Act as follows:

- Grey Box Grassy Woodlands and Derived Native Grasslands of South-eastern Australia.

Commonwealth DCCEEW published 'Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-Eastern Australia: A guide to the identification, assessment and management of a nationally threatened ecological community *Environment Protection and Biodiversity Conservation Act 1999*' in effect from June 2012 (Commonwealth TSSC, 2012). The guide lists key diagnostic characteristics designed to inform the identification of the ecological community. Assemblages of native species that do not meet the key diagnostics are not part of the nationally listed ecological community.

Vegetation that occurs within the subject land was determined to not meet the condition thresholds for listing under the EPBC Act. This is due to the understory vegetation across all three zones (1, 2 and 3) within the subject land being predominately exotic in composition as determined by BAM data collected

(refer to **Table 9** and **Appendix F**). While the overstory in Zone 1 meets requirements for listing as this community, plant cover in the ground layer must compose at least 10% native cover of perennial grass species (Commonwealth TSSC, 2012), which was not recorded in the collected BAM plot data. Further discussion of this determination and its assessment against the condition requirements for listing as the national ecological community are found in **Appendix C**.

4.4.2.2. BOX GUM WOODLAND

PCT 277: Blakely's Red Gum – Yellow Box tall grassy woodland of the NSW Western Slopes is associated with the Critically Endangered Ecological Community (CEEC), commonly known as Box Gum Woodland and listed under the EPBC Act as follows:

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

Commonwealth DCCEEW published 'Approved Conservation Advice for the White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland' in effect from August 2023 (Commonwealth DCCEEW, 2023a). The guide lists key diagnostic characteristics designed to inform the identification of the ecological community. Assemblages of native species that do not meet the key diagnostics are not part of the nationally listed ecological community.

Vegetation that occurs within the subject land was determined to not meet the condition thresholds for listing under the EPBC Act. This is due to the understory vegetation across both zones (4 and 5) within the subject land being predominately exotic in composition as determined by BAM data collected and shown in **Table 9** and **Appendix F**. Neither zone meets the requirements for any condition class listing of this community, due to listing requiring a ground layer that is predominately native as well as the understory requiring at least 12 native, non-grass species (such as forbs, shrubs, ferns and sedges) (Commonwealth DCCEEW, 2023a). Further discussion of this determination and its assessment against the condition requirements for listing as the national ecological community are found in **Appendix C**.

4.5. Vegetation integrity (vegetation condition)

4.5.1. VEGETATION INTEGRITY SURVEY PLOTS

A total of six vegetation integrity survey plots were undertaken to meet the minimum number of plots required for each zone in accordance with subsection 4.3.4. Table 3 of the BAM. All vegetation integrity survey plots were used in the assessment.

Vegetation integrity survey plots conducted in the road verges of Ashfords Road (BAM4), and Boiling Down Road (BAM 5) were not able to be completed at the regular size of 20 x 50 m due to spatial limitations of these sites respectively. As such, BAM 4 was conducted as a 5 x 50 m plot with floristics completed across the entirety of the plot. BAM 5 was conducted as a 6 x 50 m plot with floristics completed across the entirety of the plot. Areas surrounding the plots were assessed for additional species, with other native species not occurring just beyond the areas of these plots. As such, they were deemed to be suitable for vegetation calculations despite being conducted at a lesser size.

4.5.2. SCORES

Composition, structure, function and resulting vegetation integrity scores for each zone are presented in **Table 9**.

TABLE 9: VEGETATION INTEGRITY SCORES

Vegetation Zone ID	Composition condition score	Structure condition score	Function condition score	Vegetation integrity score	Hollow bearing trees present?
Zone 1	17.2	50.8	81.6	41.5	Yes
Zone 2	50.5	3.4	14.4	13.5	No
Zone 3	27.9	10.8	15.1	16.6	No
Zone 4	42.4	33.1	56.9	43.1	No
Zone 5	0.8	0	2.5	0.3	No

4.5.3. USE OF BENCHMARK DATA

Vegetation Condition Benchmarks are derived from the analysis of vegetation survey plot data and are maintained within the BioNet Vegetation Classification. Subsection 3.4.4 of the BAM defines Vegetation Condition Benchmarks as:

“The reference state to which sites are compared to score their site-scale biodiversity values or set goals for management or restoration. The 3 primary attributes of biodiversity; composition, structure and function are described by benchmarks”.

The vegetation integrity score within each vegetation type can be compared to best examples of the PCT in the landscape benchmarks.

Benchmark data for PCTs 76 and 277 were reviewed in the BioNet Vegetation Classification to gain an indication of the original vegetation type for each zone. Additional information was considered to determine the most likely original PCT for each zone. Guided by the BAM subsection 3.4.4 Box 6, this included consideration of:

- remaining species composition,
- patterns of surrounding vegetation,
- landscape attributes, including aspect, slope, and position,
- soil type and underlying lithology, and
- historical land management practices in the area.

When entering plot data for the subject land, the relevant benchmark data from the BioNet Vegetation Classification was automatically populated when the PCT was selected, and vegetation zone and IBRA Bioregion added in the BAM-C.

5. Habitat suitability for threatened species

Impact assessment relating to habitat suitability is not required on category 1-exempt land (NSW DPE, 2022d), and therefore Vegetation Zone 2 has been excluded from the following habitat suitability assessment. The following assessment identifies habitat suitability for threatened species within all other vegetation zones.

5.1. Identification of threatened species for assessment

5.1.1. IDENTIFICATION OF ECOSYSTEM CREDIT SPECIES

Ecosystem credit species are threatened species whose occurrence can generally be predicted by vegetation surrogates and/or landscape features, or that have a low probability of detection using targeted surveys.

Ecosystem credit species predicted to occur within the subject land are generated by the BAM-C following the input of vegetation integrity data and the PCT identified within **Section 4**. Ecosystem credit species not generated by the BAM-C however predicted to occur on site were manually added and justification is provided in **Section 5.1.1.1**. Ecosystem credit species predicted to occur in the subject land, and sensitivity to gain class is summarised in **Table 10** below. Justification for exclusion or partial exclusion from further assessment is provided in **Section 5.1.1.2**.

5.1.1.1. ECOSYSTEM CREDIT SPECIES MANUALLY ADDED TO THE BAM-C

Gang-gang Cockatoo (*Callocephalon fimbriatum*)

Gang-gang Cockatoo is a dual credit species. The TBDC indicates that it is nomadic, occupying tall mountain forests and woodlands in spring and summer before moving to drier open eucalypt forests and woodlands in autumn and winter. Gang-gang Cockatoo feeds mainly on seeds obtained in trees and shrubs, mostly from eucalypts and wattles, and has been known to feed on seeds of introduced trees and shrubs around human settlements as well as insect larvae. As there are known records within 10 km of the subject land and suitable foraging habitat is present in the subject land Gang-gang Cockatoo has been manually added to the BAM-C.

Spotted Harrier (*Circus assimilis*)

Spotted Harrier is an ecosystem credit species. The TBDC indicates that the species occurs in grassy open woodland and is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands. As there are known records of Spotted Harrier within 10 km and the subject land presents suitable foraging habitat and potential nest trees, this species has been manually added to the BAM-C.

Varied Sittella (*Daphoenositta chrysoptera*)

Varied Sittella is an ecosystem credit species. The TBDC indicates that it inhabits eucalypt forests and woodland, particularly those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and *Acacia* woodland where it forages for arthropods. As there are known records within 10 km of the subject land, and suitable nesting and foraging habitat is present in the subject land itself, Varied Sittella has been manually added to the BAM-C.

Little Lorikeet (*Glossopsitta pusilla*)

Little Lorikeet is an ecosystem credit species. The TBDC indicates that the species forages primarily in the canopy of open *Eucalyptus* Forest and woodland, with preference to riparian habitats due to higher soil fertility and hence greater productivity. Little Lorikeet is known to breed in hollows with small (3 cm) entrances and 2 – 15 m above ground. As there are known records within 10 km of the subject land, and

suitable nesting and foraging habitat is present in the subject land itself, Little Lorikeet has been manually added to the BAM-C.

Little Eagle (*Hieraaetus morphnoides*)

Little Eagle is a dual credit species. The TBDC indicates that the species can be found throughout mainland Australia except in the most densely forested parts of the Dividing Range escarpment. It occupies open eucalypt forest, woodland or open woodland, Sheoak or *Acacia* woodlands and riparian woodlands of interior NSW. There are known records of Little Eagle within 10 km and the subject land present suitable foraging habitat and potential nest trees. This species has been manually added to the BAM-C.

Square-tailed Kite (*Lophoictinia isura*)

Square-tailed Kite is a dual credit species. The TBDC indicates that the species within NSW has scattered records throughout the state which indicate that the species is a regular resident in the north, north-east and along the major west-flowing river systems. It occurs across a variety of timbered habitats including dry woodlands and open forests, particularly timbered watercourses. There are known records of Square-tailed Kite within 10 km and the subject land presents suitable foraging habitat and potential nest trees. This species has been manually added to the BAM-C.

Black-chinned Honeyeater (eastern subspecies) (*Melithreptus gularis gularis*)

Black-chinned Honeyeater is an ecosystem credit species. The TBDC indicates that the species is widespread within NSW, with records from the tablelands and western slopes of the Great Dividing Range to the north-west and central-west plains and the Riverina. It occupies mostly upper levels of drier open forest and woodlands dominated by box and ironbark eucalypts. As there are known records of Black-chinned Honeyeater within 10 km and the subject land presents suitable foraging habitat and potential nest trees, this species has been manually added to the BAM-C.

Gilbert's Whistler (*Pachycephala inornata*)

Gilbert's Whistler is an ecosystem credit species. The TBDC indicates that the species occurs in a range of habitat within NSW including box-ironbark woodlands, where Gilbert's Whistler forages on or near the ground in shrub thickets and tops of small trees. As there are known records of Gilbert's Whistler within 10 km and the subject land presents suitable foraging habitat and potential nest trees, this species has been manually added to the BAM-C.

Rosenberg's Goanna (*Varanus rosenbergi*)

Rosenberg's Goanna is an ecosystem credit species. The TBDC indicates that the species occurs on Sydney Sandstone in the Wollemi National Park to the north-west of Sydney, in Goulburn and ACT regions and near Cooma in the south, with records also occurring from the South Western Slopes near Khancoban and Tooma River. It can be found in heath, open forest and woodland vegetation types and is associated with termites and their mounds, which are considered a critical habitat feature. There are no records of this species in ALA or Bone although there are other records of this species in the area. It is also within its known range. and the subject land presents suitable foraging habitat and potential shelter locations, this species has been manually added to the BAM-C.

5.1.1.2. ECOSYSTEM CREDIT SPECIES EXCLUDED OR PARTIALLY EXCLUDED FROM FURTHER ASSESSMENT

South-eastern Glossy Black-Cockatoo (Foraging) (*Calyptorhynchus lathami*)

South-eastern Glossy Black-Cockatoo is an ecosystem credit species for foraging habitat. The TBDC and BAM-C state that a foraging habitat constraint for the South-eastern Glossy Black-Cockatoo is the presence of *Allocasuarina* and *Casuarina* species. This species feeds almost exclusively on the seeds of several species of She-oak (*Casuarina* and *Allocasuarina* species), shredding the cones with its massive bill (Hourigan, 2012). Vegetation surveys of the subject land recorded no *Allocasuarina* or *Casuarina*

species and as such, this species was excluded from further assessment as an ecosystem credit species. Breeding habitat is further assessed for this species under the species credit system in the sections below.

WHITE-BELLIED SEA-EAGLE (*HALIAEETUS LEUCOGASTER*)

The TBDC states that foraging habitat constraint for White-bellied Sea-Eagle is waterbodies (within 1 km of rivers, lakes, large dams or creeks, wetlands and coastlines). No suitable water bodies occur within 1 km of the subject land, and as such, this species was excluded from further assessment as an ecosystem credit species.

5.1.1.3. ECOSYSTEM CREDIT SPECIES UNABLE TO BE ADDED

Southern Whiteface (*Aphelocephala leucopsis*)

Southern Whiteface has not yet been assigned a credit class; however, it appears to fulfill the criteria of ecosystem credit class as it is widely distributed, highly mobile and cannot be reliably detected from survey. This species was predicted to occur within the subject land through the EPBC PMST report which states the species or species habitat is known to occur within the area. The Commonwealth DCCEEW Conservation Advice (Commonwealth DCCEEW, 2023c) indicates that Southern Whiteface live in a wide range of open woodlands and shrublands where there is an understorey of grasses or shrubs, or both. They are known to forage almost exclusively on the ground, favouring habitat with low tree densities and an herbaceous understorey litter cover (Commonwealth DCCEEW, 2023c). As there are multiple known records within 10 km of the subject land and suitable foraging habitat is present in the subject land itself, Southern Whiteface has considered for further assessment. However, this species cannot be manually added to the BAM-C.

5.1.1.4. ECOSYSTEM CREDIT SPECIES OCCURRENCE

No ecosystem credit species were recorded within or directly surrounding the assessment area during field surveys. Previous surveys undertaken for the approved Gregadoo Solar Farm have recorded the following ecosystem credit species within the subject land and/or immediate surrounds (NGH, 2018):

- Yellow-bellied Sheath-tail-bat (*Saccolaimus flaviventris*), and
- Superb Parrot (*Polytelis swainsonii*).

TABLE 10: PREDICTED ECOSYSTEM CREDIT SPECIES

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	Sensitivity to gain class
		BC Act	EPBC Act						
Regent Honeyeater (Foraging)	<i>Anthochaera phrygia</i>	Critically Endangered	Critically Endangered	Yes	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 277: Zone 4 and Zone 5	High
Dusky Woodswallow	<i>Artamus cyanopterus cyanopterus</i>	Vulnerable	Not Listed	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5	Moderate
Gang-gang Cockatoo (Foraging)	<i>Callocephalon fimbriatum</i>	Endangered	Endangered	Yes	<input type="checkbox"/> BAM-C <input checked="" type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 277: Zone 4 and Zone 5	Moderate
South-eastern Glossy Black-Cockatoo (Foraging)	<i>Calyptorhynchus lathami lathami</i>	Vulnerable	Vulnerable	Yes	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	No	Habitat Constraints	n/a	High
Spotted Harrier	<i>Circus assimilis</i>	Vulnerable	Not Listed	No	<input type="checkbox"/> BAM-C <input checked="" type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5	Moderate
Brown Treecreeper (eastern subspecies)	<i>Climacteris picumnus victoriae</i>	Vulnerable	Vulnerable	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5	High
Varied Sittella	<i>Daphoenositta chrysoptera</i>	Vulnerable	Not Listed	No	<input type="checkbox"/> BAM-C <input checked="" type="checkbox"/> TBDC <input type="checkbox"/> Previous survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5	Moderate

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	Sensitivity to gain class
		BC Act	EPBC Act						
Spotted-tailed Quoll	<i>Dasyurus maculatus</i>	Vulnerable	Endangered	No	<input type="checkbox"/> Current survey <input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 277: Zone 4 and Zone 5	High
Black Falcon	<i>Falco subniger</i>	Vulnerable	Not Listed	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5	Moderate
Little Lorikeet	<i>Glossopsitta pusilla</i>	Vulnerable	Not Listed	No	<input type="checkbox"/> BAM-C <input checked="" type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 277: Zone 4 and Zone 5	High
White-bellied Sea-Eagle (Foraging)	<i>Haliaeetus leucogaster</i>	Vulnerable	Not Listed	Yes	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	No	Habitat Constraints	n/a	High
Little Eagle (Foraging)	<i>Hieraaetus morphnoides</i>	Vulnerable	Not Listed	Yes	<input type="checkbox"/> BAM-C <input checked="" type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5	Moderate
White-throated Needle-tail	<i>Hirundapus caudacutus</i>	Vulnerable	Vulnerable	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5	High
Swift Parrot (Foraging)	<i>Lathamus discolor</i>	Endangered	Critically Endangered	Yes	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5	Moderate

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	Sensitivity to gain class
		BC Act	EPBC Act						
Pink Cockatoo (Foraging)	<i>Lophochroa leadbeateri</i>	Vulnerable	Endangered	Yes	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3	Moderate
Square-tailed Kite (Foraging)	<i>Lophoictinia isura</i>	Vulnerable	Not Listed	Yes	<input type="checkbox"/> BAM-C <input checked="" type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5	Moderate
South-eastern Hooded Robin	<i>Melanodryas cucullata cucullata</i>	Endangered	Endangered	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5	Moderate
Black-chinned Honeyeater (eastern subspecies)	<i>Melithreptus gularis gularis</i>	Vulnerable	Not Listed	No	<input type="checkbox"/> BAM-C <input checked="" type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5	Moderate
Large Bent-winged Bat (Foraging)	<i>Miniopterus orianae oceanensis</i>	Vulnerable	Not Listed	Yes	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 277: Zone 4 and Zone 5	High
Turquoise Parrot	<i>Neophema pulchella</i>	Vulnerable	Not Listed	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5	High
Gilbert's Whistler	<i>Pachycephala inornata</i>	Vulnerable	Not Listed	No	<input type="checkbox"/> BAM-C <input checked="" type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5	Moderate

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	Sensitivity to gain class
		BC Act	EPBC Act						
Scarlet Robin	<i>Petroica boodang</i>	Vulnerable	Not Listed	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5	Moderate
Flame Robin	<i>Petroica phoenicea</i>	Vulnerable	Not Listed	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5	Moderate
Superb Parrot (Foraging)	<i>Polytelis swainsonii</i>	Vulnerable	Vulnerable	Yes	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5	Moderate
Grey-crowned Babbler (eastern subspecies)	<i>Pomatostomus temporalis</i>	Vulnerable	Not Listed	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5	Moderate
Grey-headed Flying-fox (Foraging)	<i>Pteropus poliocephalus</i>	Vulnerable	Vulnerable	Yes	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5	High
Speckled Warbler	<i>Pyrrholaemus sagittatus</i>	Vulnerable	Not Listed	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5	High
Yellow-bellied Sheathtail-bat	<i>Saccolaimus flaviventris</i>	Vulnerable	Not Listed	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input checked="" type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5	High

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	Sensitivity to gain class
		BC Act	EPBC Act						
Diamond Firetail	<i>Stagonopleura guttata</i>	Vulnerable	Vulnerable	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5	Moderate
Rosenberg's Goanna	<i>Varanus rosenbergi</i>	Vulnerable	Not Listed	No	<input type="checkbox"/> BAM-C <input checked="" type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5	High

5.1.2. IDENTIFICATION OF SPECIES CREDIT SPECIES

Species credit species are threatened species for which vegetation surrogates and/or landscape features cannot reliably predict the likelihood of their occurrence or components of their habitat. Targeted surveys or an expert report may be undertaken to confirm the presence of these species on the subject land.

Species credit species predicted to occur within the subject land are generated by the BAM-C following the input of Vegetation Integrity data and the PCT identified within Chapter 4. Species credit species not generated by the BAM-C however predicted to occur on site were manually added and justification for addition is provided in **Sections 5.1.2.1** and **5.1.2.3**. Species credit species predicted to occur in the subject land, and sensitivity to gain class is included in **Table 11** and **Table 12**. Justification for exclusion or partial exclusion from further assessment is provided in **Sections 5.1.2.2, 5.1.2.4, and 5.1.2.5**.

5.1.2.1. SPECIES CREDIT FLORA SPECIES MANUALLY ADDED TO THE BAM-C

No flora species were manually added to the BAM-C.

5.1.2.2. SPECIES CREDIT FLORA SPECIES EXCLUDED OR PARTIALLY EXCLUDED FROM FURTHER ASSESSMENT

Ausfeld's Wattle (*Acacia ausfeldii*)

The TBDC and BAM-C state that a habitat constraint for the Ausfeld's Wattle is the presence of footslopes and low rises on sandstone. The subject land does not contain the habitat constraints footslopes and low rises on sandstone. As such, Ausfeld's Wattle was excluded from further assessment.

No other species credit flora species were excluded or partially excluded from further assessment.

TABLE 11: CANDIDATE FLORA SPECIES CREDIT SPECIES

Common name	Scientific name	Listing status		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				
Ausfeld's Wattle	<i>Acacia ausfeldii</i>	Vulnerable	Not Listed	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	No	Habitat constraints	N/A
Yass Daisy	<i>Ammobium craspedioides</i>	Vulnerable	Vulnerable	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5
A Spear-grass	<i>Austrostipa wakoolica</i>	Endangered	Endangered	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5
Sand-hill Spider Orchid	<i>Caladenia arenaria</i>	Endangered	Endangered	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5
Small Scurf-pea	<i>Cullen parvum</i>	Endangered	Not Listed	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5
Pine Donkey Orchid	<i>Diuris tricolor</i>	Vulnerable	Not Listed	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5
n/a	<i>Euphrasia arguta</i>	Critically Endangered	Critically Endangered	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5
Leafless Indigo	<i>Indigofera efoliata</i>	Endangered	Endangered	<input checked="" type="checkbox"/> BAM-C	Yes	N/A	PCT 76: Zone 1 and Zone 3

Common name	Scientific name	Listing status		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				
				<input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey			PCT 277: Zone 4 and Zone 5
Tarengo Leek Orchid	<i>Prasophyllum petilum</i>	Endangered	Endangered	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5
A Leek-orchid	<i>Prasophyllum</i> sp. Wybong	Not Listed	Critically Endangered	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5
Small Purple-pea	<i>Swainsona recta</i>	Endangered	Endangered	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5
Silky Swainson-pea	<i>Swainsona sericea</i>	Vulnerable	Not Listed	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5

5.1.2.3. SPECIES CREDIT FAUNA SPECIES MANUALLY ADDED TO THE BAM-C

GANG-GANG COCKATOO (BREEDING) (*CALLOCEPHALON FIMBRIATUM*)

Gang-gang Cockatoo is a species credit species for breeding habitat. The TBDC states that potential nest trees are forest and woodland eucalypts containing hollows that are at least 3 m above the ground and have a hollow diameter of 7 cm or larger. As there are known records within 10 km of the subject land and suitable nesting habitat is present in Vegetation Zone 1 of the subject land, Gang-gang Cockatoo has been manually added to the BAM-C.

SQUARE-TAILED KITE (BREEDING) (*LOPHOICTINIA ISURA*)

Square-tailed Kite is a species credit species for breeding habitat. The TBDC states that potential nest trees are difficult to identify as there are lot of comparable sized stick nests built by other species, however, are described as a large stick nest in the top half of the tree canopy. As there are known record within 10 km of the subject land and suitable breeding habitat present within the subject land itself, Square-tailed Kite has been manually added to the BAM-C.

MASKED OWL (*TYTO NOVAEHOLLANDIAE*)

Masked Owl is a species credit species. The TBDC states that habitat constraints for the species are living or dead trees with a hollow with a diameter of 20 cm or greater, and that occurs higher than 4 m above the ground. The Masked Owl lives in dry eucalypt forests and woodlands from sea level to 1100 m. Roosts and breeds in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting. There are known records of this species within 10 km of the subject land, and suitable breeding habitat has been identified. This species has been manually added to the BAM-C.

BARKING OWL (*NINOX CONNIVENS*)

Barking Owl is a species credit species. The TBDC indicates that habitat constraints for the species are living or dead trees with a hollow with a diameter of 20 cm or greater, and that occurs higher than 4 m above the ground. The Barking Owl lives in woodlands, primarily, but occurs in forests, partially cleared areas and occasionally near or in rural towns and well-treed suburbs. There have been numerous records of this species within 10 km of the subject land, and suitable breeding habitat has been identified. The Barking Owl has been manually added to the BAM-C.

LITTLE EAGLE (*HIERAAETUS MORPHNOIDES*)

Little Eagle is a species credit species for breeding habitat. The TBDC indicates that potential nest trees for the species are live, or occasionally dead, large old trees usually within vegetation. It further notes that paddock trees can provide important breeding habitat for the species. Little Eagle occupies a range of woodland and forested habitats throughout the interior of NSW. As there are known records of Little Eagle within 10 km of the subject land and suitable breeding habitat within the subject land itself, this species has been manually added to the BAM-C.

5.1.2.4. SPECIES CREDIT FAUNA SPECIES EXCLUDED FROM FURTHER ASSESSMENT

REGENT HONEYEATER (BREEDING) (*ANTHOCHAERA PHRYGIA*)

Regent Honeyeater is a dual credit species. The TBDC and BAM-C state that a habitat constraint for the species is the presence of the species Important Habitat Map for the Regent Honeyeater. The Regent Honeyeater Important Habitat Map is not present within the subject land, nor does it occur within the Wagga Wagga region. As such, the Regent Honeyeater was excluded from further assessment.

PINK-TAILED LEGLESS LIZARD (*APRASIA PARAPULCHELLA*)

Pink-tailed Legless Lizard is a species credit species. The TBDC and BAM-C state that habitat constraint for the species is the presence of rocky habitat, or an area within 50 m of rocky habitat. The species is

commonly found beneath small, partially embedded rocks and appears to inhabit burrows beneath these rocks for a considerable time. This habitat is not present within the subject land, with only very minor occurrences of unsuitable small, scattered surface rock present. The groundlayer of the subject land has been modified through cropping and ploughing, further reducing the potential for this habitat feature to be present. As such, the Pink-tailed Legless Lizard was excluded from further assessment.

STRIPED LEGLESS LIZARD (*DELMA IMPAR*)

Striped Legless Lizard is a species credit species. The TBDC does not outline specific habitat constraints for the species and can require targeted surveys to determine presence in suitable habitat. No threatened reptile species were located during field survey. High weed incursion, cropping and ploughing, prolonged isolation from nearby habitat and intense grazing pressure suggests that the Study Area does not provide suitable habitat for the Striped Legless Lizard species. Surrounding landscape shows evidence of recent ploughing and non-native species cropping has occurred. The Striped Legless Lizard has been excluded from further assessment.

WHITE-BELLIED SEA-EAGLE (*HALIAEETUS LEUCOGASTER*)

White-bellied Sea-Eagle is a species credit species for breeding habitat. The TBDC states that breeding habitat for White-bellied Sea-Eagle is live large old trees within 1 km of a rivers, lakes, large dams or creeks, wetlands and coastlines and the presence of a large stick nest within tree canopy. No suitable water bodies occur within 1 km of the subject land. Therefore, White-bellied Sea-Eagle is excluded from further assessment.

SWIFT PARROT (BREEDING) (*LATHAMUS DISCOLOR*)

Swift Parrot is a dual credit species. The subject land does not occur within the Important Habitat Map for the Swift Parrot. As such, Swift Parrot has been excluded from further assessment.

BOOROOLONG FROG (*LITORIA BOOROOLONGENSIS*)

Booroolong Frog is a species credit species. While neither the TBDC or BAM-C list habitat constraints for this species, the NSW Survey Guide for Threatened Frogs lists potential habitat as being permanent, or near permanent river environments with rock structures (e.g. bedrock or cobble) (DPIE, 2020b). Neither permanent or near permanent waterways with the mentioned rock structures occur in or directly surrounding the subject land. As such, the Booroolong Frog has been excluded from further assessment.

LARGE BENT-WINGED BAT (BREEDING) (*MINIOPTERUS ORIANAE OCEANENSIS*)

Large Bent-winged Bat is a species credit species for breeding habitat. The TBDC and BAM-C state that a habitat constraint for the Large Bent-winged Bat is the presence of caves or cave, tunnel, mine, culvert or other structure known or suspected to be used for breeding including species records with microhabitat code "IC - in cave", observation type code "E nest-roost" or with numbers of individuals > 500. These habitat features are not present within the subject land, and as such, the Large Bent-winged Bat was excluded from further assessment.

GREY-HEADED FLYING-FOX (BREEDING) (*PTEROPUS POLIOCEPHALUS*)

Grey-headed Flying-fox is a species credit species for breeding habitat. The TBDC and BAM-C state that a habitat constraint for the Grey-headed Flying-fox is the presence of breeding camps. No breeding camps were identified within or directly surrounding the subject land. Roosting of this species was not observed within the subject land, nor did mature canopy trees display evident signs of species use e.g. defoliation. As such, Grey-headed Flying-fox was excluded from further assessment.

5.1.2.5. SPECIES CREDIT FAUNA SPECIES EXCLUDED OR PARTIALLY EXCLUDED FROM FURTHER ASSESSMENT

SOUTH-EASTERN GLOSSY BLACK-COCKATOO (*CALYPTORHYNCHUS LATHAMI*) (BREEDING)

South-eastern Glossy Black-Cockatoo is a species credit species for breeding habitat. The TBDC indicates that breeding habitat constraints for the South-eastern Glossy Black-Cockatoo are large hollows in dead and living eucalypt trees. The nest hollow should have entrance diameter of at least 15 cm and be at least 8 m above the ground. The subject and provides potential breeding habitat in form of suitable hollow bearing trees within Vegetation Zone 1. This species has been partially excluded from further assessment due to habitat constraints in Vegetation Zones 3, 4 and 5.

PINK COCKATOO (*LOPHOCHROA LEADBEATERI*)

Pink Cockatoo is a species credit species for breeding habitat. The TBDC indicates that breeding habitat constraints for the species are hollow bearing trees, living or dead, with hollows greater than 10 cm in diameter. The subject and provides potential breeding habitat in form of suitable hollow bearing trees within Vegetation Zone 1. This species has been partially excluded from further assessment due to habitat constraints in Vegetation Zones 3, 4 and 5.

SUPERB PARROT (*POLYTELIS SWAINSONII*)

Superb Parrot is a species credit species for breeding habitat. The TBDC indicates that breeding habitat constraints for the species are living or dead trees, particularly species that include but not limited to Blakely's Red Gum, Yellow Box or Grey Box, with hollows greater than 5 cm in diameter and greater than 4 m above the ground, The species has been previously observed utilising the area of the subject land, furthermore, the subject and provides potential breeding habitat in form of suitable hollow bearing trees within Vegetation Zone 1. This species has been partially excluded from further assessment due to habitat constraints in Vegetation Zones 3, 4 and 5.

SQUIRREL GLIDER (*PETAURUS NORFOLCENSIS*)/ SQUIRREL GLIDER IN THE WAGGA WAGGA LOCAL GOVERNMENT AREA

Squirrel Glider and Squirrel Glider in the Wagga Wagga Local Government Area have the Biodiversity Credit Class of species credit. The TBDC indicates do not defined specific habitat constraints for the Squirrel Glider, noting that the species relies on large old trees with hollows for nesting and breeding, and that these trees are typically no more than 50 m apart. The species inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum Forest west of the Great Dividing Range and Blackbutt-Bloodwood Forest with heath understorey in coastal areas. The subject and provides potential breeding habitat in form of hollow bearing trees in Vegetation Zone 1 and foraging microhabitats in Vegetation Zones 4. Therefore, this species and endangered population has been partially excluded from further assessment in Vegetation Zones 3 and 5.

BRUSH-TAILED PHASCOGALE (*PHASCOGALE TAPOATAFA*)

Brush-tailed Phascogale is a species credit species. The TBDC states that Brush-tailed Phascogale is associated with a wide range of PCTs across NSW and may occur in habitat without any hollow-bearing trees (noting that hollow-bearing trees are not a habitat constraint for this species). It also notes that the species nest and shelter in tree hollows with entrances 2.5 – 4 cm wide and use many different hollows over a short time span. The subject and provides potential breeding habitat in form of hollow bearing trees and foraging microhabitats in Vegetation Zones 1 and 4. Therefore, Brush-tailed Phascogale has been partially excluded from further assessment in Vegetation Zones 3 and 5.

KOALA (*PHASCOLARCTOS CINEREUS*)

Koala is a species credit species. The TBDC indicates that habitat constraints for Koala is the presence of Koala use trees, as outlined in the Koala (*Phascolarctos cinereus*) Biodiversity Assessment Method Survey Guide (NSW DPE, 2022e). For the region in which the subject land resides, the Riverina, multiple Koala use trees are highlighted, including Grey Box (*E. microcarpa*) which was found to be present within the

subject land. Therefore, the subject land provides potential suitable habitat for Koala within Vegetation Zones 2 and 4, and the species has been partially excluded from further assessment in Vegetation Zones 3 and 5.

TABLE 12: CANDIDATE FAUNA SPECIES CREDIT SPECIES

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation Zone and PCT species retained within
		BC Act	EPBC Act					
Regent Honeyeater (Breeding)	<i>Anthochaera phrygia</i>	Critically Endangered	Critically Endangered	Yes	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	No	Habitat Constraints	N/A
Pink-tailed Legless Lizard	<i>Aprasia parapulchella</i>	Vulnerable	Vulnerable	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	No	Habitat Constraints	N/A
Gang-gang Cockatoo (Breeding)	<i>Callocephalon fimbriatum</i>	Endangered	Endangered	Yes	<input type="checkbox"/> BAM-C <input checked="" type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Partial	Habitat Constraints	PCT 76: Zone 1
South-eastern Glossy Black-Cockatoo (Breeding)	<i>Calyptorhynchus lathami lathami</i>	Vulnerable	Vulnerable	Yes	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Partial	Habitat Constraints	PCT 76: Zone 1
Sloane's Froglet	<i>Crinia sloanei</i>	Endangered	Endangered	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5
Striped Legless Lizard	<i>Delma impar</i>	Vulnerable	Vulnerable	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	No	Habitat degraded	N/A
White-bellied Sea-Eagle (Breeding)	<i>Haliaeetus leucogaster</i>	Vulnerable	Not Listed	Yes	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey	No	Habitat Constraints	N/A

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation Zone and PCT species retained within
		BC Act	EPBC Act					
					<input checked="" type="checkbox"/> Current survey			
Little Eagle (Breeding)	<i>Hieraetus morphnoides</i>	Vulnerable	Not Listed	Yes	<input type="checkbox"/> BAM-C <input checked="" type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5
Key's Matchstick Grasshopper	<i>Keyacris scurra</i>	Endangered	Endangered	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5
Swift Parrot (Breeding)	<i>Lathamus discolor</i>	Endangered	Critically Endangered	Yes	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	No	Habitat Constraints	N/A
Booroolong Frog	<i>Litoria booroolongensis</i>	Endangered	Endangered	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	No	Microhabitats	N/A
Pink Cockatoo (Breeding)	<i>Lophochroa leadbeateri</i>	Vulnerable	Not Listed	Yes	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Partial	Habitat Constraints	PCT 76: Zone 1
Square-tailed Kite (Breeding)	<i>Lophoictinia isura</i>	Vulnerable	Not Listed	Yes	<input type="checkbox"/> BAM-C <input checked="" type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5
Large Bent-winged Bat (Breeding)	<i>Miniopterus orianae oceanensis</i>	Vulnerable	Not Listed	Yes	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	No	Habitat Constraints	N/A

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation Zone and PCT species retained within
		BC Act	EPBC Act					
Barking Owl	<i>Ninox connivens</i>	Vulnerable	Not Listed	No	<input type="checkbox"/> BAM-C <input checked="" type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5
Squirrel Glider	<i>Petaurus norfolcensis</i>	Vulnerable	Not Listed	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Partial	N/A	PCT 76: Zone 1 PCT 277: Zone 4
Squirrel Glider in the Wagga Wagga Local Government Area	<i>Petaurus norfolcensis</i> – endangered population	Endangered Population	Not Listed	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Partial	N/A	PCT 76: Zone 1 PCT 277: Zone 4
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	Vulnerable	Not Listed	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Partial	N/A	PCT 76: Zone 1 PCT 277: Zone 4
Koala	<i>Phascolarctos cinereus</i>	Endangered	Endangered	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Partial	N/A	PCT 76: Zone 1 PCT 277: Zone 4
Superb Parrot (Breeding)	<i>Polytelis swainsonii</i>	Vulnerable	Vulnerable	Yes	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Partial	N/A	PCT 76: Zone 1
Grey-headed Flying-fox (Breeding)	<i>Pteropus poliocephalus</i>	Vulnerable	Vulnerable	Yes	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	No	Habitat Constraints	N/A

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation Zone and PCT species retained within
		BC Act	EPBC Act					
Golden Sun Moth	<i>Synemon plana</i>	Vulnerable	Vulnerable	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5
Masked Owl	<i>Tyto novaehollandiae</i>	Vulnerable	Not Listed	No	<input type="checkbox"/> BAM-C <input checked="" type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	N/A	PCT 76: Zone 1 and Zone 3 PCT 277: Zone 4 and Zone 5

5.2. Determining presence of candidate flora species credit species

5.2.1. TARGETED SURVEY METHOD

Targeted surveys were conducted to determine the presence of *Euphrasia arguta* on 13 March 2024 and Yass Daisy (*Ammobium craspedioides*), Sand-hill Spider Orchid (*Caladenia arenaria*), Pine Donkey Orchid (*Diuris tricolor*), Leafless Indigo (*Indigofera foliata*), Tarengo Leek Orchid (*Prasophyllum petilum*), A Leek-orchid (*Prasophyllum* sp. Wybong), Small Purple-pea (*Swainsona recta*) and Silky Swainson-pea (*Swainsona sericea*) were surveyed for 5 September 2024. Targeted surveys were designed to maximise the likelihood of detection of targeted plant species, including the inclusion of optimising time of year of survey to occur during flowering season for optimal detection and identification.

Targeted surveys consisted of parallel field traverses undertaken in accordance with relevant BAM recognised NSW Government guidelines for surveying threatened plants and their habitats (DPIE, 2020c). The parallel field traverse method was selected as it systematically covers the entire area of suitable habitat within the subject land.

An indicative parallel traverse grid was set up using GIS software and followed using a GPS to maintain a distance of 10 m, as recommended in Table 1 of the guidelines for targeted surveys of orchids and forbs in open vegetation. This technique was identified as most suitable for targeted species and vegetation class occurring in the subject land. The parallel traverses were applied to the entire area of the subject land on 5 September 2024. Surveying in March was only conducted in Zone 1 and Zone 2 of the subject land and was conducted by two surveyors, taking 2 person hours. As targeted surveys of *Euphrasia arguta* were not conducted across the entire subject land, further surveys are required to ascertain its presence or absence. Surveying in September was conducted by one surveyor, taking 5.5 person hours.

While no threatened flora species were detected during field surveys, provisions of surveys were in place to allow for effective recording of threatened species if identified. These included:

- marking a GPS coordinate of the location of identified species,
- closer investigation of the area to count the number of individuals,
- determination of the area of occupancy, as well as
- a description of any relevant ecological information.

Furthermore, if particular species were unable to be correctly identified and suspected to be a threatened species, a specimen was to be collected and preserved for further investigation and identification (caution taken regarding fragility of the species).

The species surveyed as well as TBDC recommendations and results of targeted surveys undertaken are provided in **Table 13**.

5.2.2. REASONING FOR ASSUMING PRESENCE OF CANDIDATE FLORA SPECIES CREDIT SPECIES

The following species have been conservatively assumed present within Vegetation Zone 1, 3, 4 and 5, primarily due to time constraints restricting targeted surveys at TBDC recognised survey periods:

- A Spear-grass (*Austrostipa wakoolica*),
- *Euphrasia arguta* (excluded from Zone 1), and
- Small Scurf-pea (*Cullen parvum*).

5.2.3. THREATENED FLORA SURVEY RESULTS

TABLE 13: THREATENED SPECIES SURVEYS FOR CANDIDATE FLORA SPECIES CREDIT SPECIES ON THE SUBJECT LAND

Common name	Scientific name	Listing status		Survey method	Effort	BAM-C / TBDC recommended period. Timing of survey in outlined and in Bold												Present	Further assessment required
		BC Act	EPB C Act			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Yass Daisy	<i>Ammobium craspedioides</i>	V	V	Parallel field transverse	5.5 person hours	X	X	X	X	X	X	X	X	Y	Y	Y	X	No	No
A Spear-grass	<i>Austrostipa wakoolica</i>	E	E	N/a	N/a	X	X	X	X	X	X	X	X	X	Y	Y	Y	Assumed present	Yes
Sand-hill Spider Orchid	<i>Caladenia arenaria</i>	E	E	Parallel field transverse	5.5 person hours	X	X	X	X	X	X	X	X	Y	X	X	X	No	No
Small Scurf-pea	<i>Cullen parvum</i>	E	-	N/a	N/a	Y	X	X	X	X	X	X	X	X	X	X	Y	Assumed present	Yes
Pine Donkey Orchid	<i>Diuris tricolor</i>	V	-	Parallel field transverse	5.5 person hours	X	X	X	X	X	X	X	X	Y	Y	X	X	No	No
N/A	<i>Euphrasia arguta</i>	CE	CE	Parallel field transverse	2 person hours	Y	Y	Y	X	X	X	X	X	X	X	Y	Y	Assumed present*	Yes*
Leafless Indigo	<i>Indigofera foliata</i>	E	E	Parallel field transverse	5.5 person hours	X	X	X	X	X	X	X	X	Y	Y	X	X	No	No
Tarengo Leaf Orchid	<i>Prasophyllum petilum</i>	E	E	Parallel field transverse	5.5 person hours	X	X	X	X	X	X	X	X	Y	Y	Y	Y	No	No
A Leek-orchid	<i>Prasophyllum</i> sp. Wybong	-	CE	Parallel field transverse	5.5 person hours	X	X	X	X	X	X	X	X	Y	Y	X	X	No	No
Small Purple-pea	<i>Swainsona recta</i>	E	E	Parallel field transverse	5.5 person hours	X	X	X	X	X	X	X	X	Y	Y	Y	X	No	No
Silky Swainson-pea	<i>Swainsona sericea</i>	V	-	Parallel field transverse	5.5 person hours	X	X	X	X	X	X	X	X	Y	Y	Y	X	No	No

*As noted above in **Section 5.2.1** and reflected in **Table 13** surveys conducted for *Euphrasia arguta* only encompassed Vegetation Zones 1 and 2 of the subject land. They were not conducted across the remaining Vegetation Zones 3, 4 and 5. Due to this, there is a requirement for further surveys during the species flowering period as to sufficiently determine the presence or absence of this species within the subject land.

5.3. Determining presence of candidate fauna species credit species

5.3.1. TARGETED THREATENED FAUNA SURVEY METHOD AND FINDINGS

Details on the methodology and results of targeted surveys undertaken for each of the candidate fauna species credit species for further assessment are included in the sections below. Limitations related to each targeted surveys and justification for exclusion from further assessment are also provided in the sections below. A summary of the species credit species surveyed within the subject land, including whether they were recorded or assumed present in the subject land, is provided in **Table 14**.

5.3.1.1. SLOANE'S FROGLET (*CRINIA SLOANEI*)

Targeted surveys for Sloane's Froglet followed the NSW Survey Guide for Threatened Frogs (DPIE, 2020b). The guidelines detail 480 minutes (8 hrs) of aural-visual surveys which can be completed along the edges of suitable breeding habitat or, if feasible, through shallow wetlands.

Suitable breeding (and non-breeding) habitat is described as still or very slow flowing sections of permanent and temporary streams, as well as pools (e.g. farm dams) with vegetation, located on the subject land. Non-breeding habitat includes waterbodies and areas of native and non-native vegetation (including areas of cleared rural grazing land). The species is known to move between breeding and non-breeding waterbodies; connectivity between these habitats is important to maintain population processes. While the hydro lines, dams and areas of depression that are present within the subject land are somewhat connected to the surrounding landscape, particularly through Boiling Down Creek, long-term modification of these habitats through agricultural practices such as cropping, fertilisation and ploughing have negatively impacted the conditions of these potential habitats. This is evident through the lack of riparian vegetation present in and surrounding the habitats, as well as the prominence of algae within the dams which suggest nutrification of these waterbodies.

Nevertheless, targeted Sloane's Froglet surveys were undertaken over four nights for approximately 2 hours each night after dusk. Traverses of the subject land were conducted with a particular focus on the central hydro line and dams present in the south and north of the subject land, in which frogs (non-threatened) were consistently heard. Survey paths for each survey were recorded using a hand-held GPS device (**Figure 14**). Surveys involved aural (call-playback/listening to calls) and visual (spotlighting and active searches) observation. Sloane's Froglet was not recorded in the subject land during targeted surveys within the TBDC survey months (August) and consequently was removed from further assessment.

5.3.1.2. RAPTOR NEST SEARCHES

NSW DCCEEW is currently developing survey guidance for threatened bird species and in the interim, assessors are to undertake a species survey using best practice methods that can be replicated for repeat surveys.

Raptor nest searches were undertaken for the following two raptor species:

- Little Eagle (*Hieraaetus morphnoides*), and
- Square-tailed Kite (*Lophoictinia isura*).

The two raptor species are species credit species for breeding habitat and survey comments within the TBDC indicate searches for breeding habitat are an initial step in surveying. The TBDC describes breeding habitat for both species as:

- live (occasionally dead for Little Eagle) large old trees within suitable vegetation, and

- the presence of a male and female, or
- any adult Little Eagle or female Square-tailed Kite with nesting material, or
- or an individual on a large stick nest in the top half of the tree canopy, or
- Little Eagle pairs displaying.

A careful search for breeding habitat (large stick nests) within the subject land was conducted, including inspection of all trees on 13 March 2024 and 5 – 7 August 2024. No large stick nests were observed within the subject land.

In accordance with the BAM-C recommended buffers given to nesting trees, an additional search of the surrounding accessible area was conducted for large stick nests to help provide a more comprehensive understanding of potential breeding habitat. The trees directly adjacent to the subject land in the vicinity of Boiling Down Creek were surveyed (as shown in **Figure 13**). As well, surveying included slowly driving along Boiling Down Road within a 300 m buffer with the use of binoculars to search the immediate area and the use of incidental raptor surveys conducted between the hours of 10:00 and 16:00 that align with thermal uplift to locate raptors near to the subject land. No large stick nests or threatened raptors were observed directly adjacent to the subject land.

Due to no evidence of the presence of breeding habitat (large stick nests), it can be concluded that the site is not being used as breeding habitat, therefore, no further surveys were undertaken or deemed necessary. Consequently, Little Eagle (Breeding) and Square-tailed Kite (Breeding) was removed from further assessment.

5.3.1. SPECIES EXCLUDED FROM FURTHER ASSESSMENT THOUGH INCLUDED IN TARGETED SURVEYS

The following species were excluded from further assessment due to habitat constraints, and/or microhabitat limitations (as discussed in **Section 5.1.2.4**), however stick nest searches, bird surveys and raptor surveys outlined in the sections above included measures suitable to detect White-bellied Sea-Eagle (Breeding) in the case of unexpected or incidental observations.

No unexpected or incidental observations were made for this species further justifying exclusion from further assessment.

5.3.2. REASONING FOR ASSUMING PRESENCE OF CANDIDATE FAUNA SPECIES CREDIT SPECIES

The following fauna species credit species are assumed present in the absence of targeted survey following relevant guidelines:

- Gang-gang Cockatoo (*Callocephalon fimbriatum*),
- South-eastern Glossy Black Cockatoo (*Calyptorhynchus lathami lathami*),
- Key's Matchstick Grasshopper (*Keyacris scurra*),
- Pink Cockatoo (*Lophochroa leadbeateri*),
- Barking Owl (*Ninox connivens*),
- Squirrel Glider (*Petaurus norfolcensis*) including Endangered population,
- Brush-tailed Phascogale (*Phascogale tapoatafa*),
- Koala (*Phascolarctos cinereus*),
- Superb Parrot (*Polytelis swainsonii*),
- Golden Sun Moth (*Synemon plana*), and
- Masked Owl (*Tyto novaehollandiae*).

TABLE 14: THREATENED SPECIES SURVEYS FOR CANDIDATE FAUNA SPECIES CREDIT SPECIES ON THE SUBJECT LAND

Common name	Scientific name	Listing status		Survey method	Effort	BAM-C / TBDC recommended period. Timing of survey in outlined and in Bold												Present	Further assessment required
		BC Act	EPBC Act			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Gang-gang Cockatoo (Breeding)	<i>Callocephalon fimbriatum</i>	E	E	Habitat suitability	16 people hours	Y	N	N	N	N	N	N	N	N	Y	Y	Y	Assumed present	Yes
South-eastern Glossy Black-Cockatoo	<i>Calyptorhynchus lathami lathami</i>	V	V	Habitat suitability	16 people hours	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	Assumed present	Yes
Sloane's Froglet	<i>Crinia sloanei</i>	V	V	Section 5.3.1.1	8 people hours	N	N	N	N	N	N	Y	Y	N	N	N	N	No	No
Little Eagle (Breeding)	<i>Hieraetus morphnoides</i>	V	-	Raptor nest search	2.5 people hours	N	N	N	N	N	N	Y	Y	Y	N	N	N	No	No
Key's Matchstick Grasshopper	<i>Keyacris scurra</i>	E	E	Habitat suitability	16 people hours	N	N	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Assumed present	Yes
Pink Cockatoo (Breeding)	<i>Lophochroa leadbeateri</i>	V	-	Habitat suitability	16 people hours	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Assumed present	Yes
Square-tailed Kite (Breeding)	<i>Lophoictinia isura</i>	V	-	Raptor nest search	2.5 people hours	Y	N	N	N	N	N	N	N	Y	Y	Y	Y	No	No
Barking Owl	<i>Ninox connivens</i>	V	-	Habitat suitability	16 people hours	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	Assumed present	Yes
Squirrel Glider	<i>Petaurus norfolcensis</i>	V	-	Habitat suitability	16 people hours	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Assumed present	Yes
Squirrel Glider in the Wagga Wagga Local Government Area	<i>Petaurus norfolcensis – endangered population</i>	E	-	Habitat suitability	16 people hours	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Assumed present	Yes
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	V	-	Habitat suitability	16 people hours	Y	Y	Y	Y	Y	Y	N	N	N	N	N	Y	Assumed present	Yes
Koala	<i>Phascolarctos cinereus</i>	E	E	Habitat suitability	16 people hours	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Assumed present	Yes

Common name	Scientific name	Listing status		Survey method	Effort	BAM-C / TBDC recommended period. Timing of survey in outlined and in Bold												Present	Further assessment required
		BC Act	EPBC Act			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Superb Parrot (Breeding)	<i>Polytelis swainsonii</i>	V	-	Habitat suitability	16 people hours	N	N	N	N	N	N	N	N	Y	Y	Y	N	Assumed present	Yes
Golden Sun Moth	<i>Synemon plana</i>	V	V	Habitat suitability	16 people hours	N	N	N	N	N	N	N	N	N	N	Y	Y	Assumed present	Yes
Masked Owl	<i>Tyto novaehollandiae</i>	V	-	Habitat suitability	16 people hours	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	Assumed present	Yes

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

Table 15 describes the area and location of suitable habitat within the subject land for candidate flora and fauna species credit species. An estimate, based on habitat constraints and microhabitats the species depend on (species polygon), has been used for species assumed to be present that are associated with an area (ha) unit of measure (as indicated by the TBDC, BAM-C and other recognised guidelines). Species polygons (0.30 ha) have been prepared for all species assumed present (**Figure 16** and **Figure 17**). This includes Zone 1, 3, 4 and 5 as habitat suitability assessment does not apply to Zone 2 due to the presence of category 1-exempt land.

TABLE 15: RESULTS FOR PRESENT SPECIES (RECORDED WITHIN THE SUBJECT LAND)

Common name	Scientific name	Biodiversity risk weighting	SAIL entity	Habitat constraints / microhabitats present on the subject land / vegetation zone	Abundance	Extent (ha) of suitable habitat present on site	Species specific recommendations e.g. buffers, general comments and species polygons	Habitat condition (VI score)
Flora								
A Spear-grass	<i>Austrostipa wakoolica</i>	High (2)	No	Within known geographic region of the species and found within alluvial plains and plains. Known associated canopy species present within subject land.	N/A	Zone 1: 0.03 ha Zone 3: 0.03 ha Zone 4: 0.03 ha Zone 5: 0.08 ha	Potential habitat for this species occurs in all zones of the subject land. As such, the species polygon encompasses all zones. Targeted surveys for the species scheduled for optimal survey period (Oct – Dec).	Zone 1: 41.5 Zone 3: 16.6 Zone 4: 41.3 Zone 5: 0.3
Small Scurf-pea	<i>Cullen parvum</i>	High (2)	No	Within region to current populations known from Wagga Wagga. Known association with species present within subject land.	N/A	Zone 1: 0.03 ha Zone 3: 0.03 ha Zone 4: 0.03 ha Zone 5: 0.08 ha	Potential habitat for this species occurs in all zones of the subject land. As such, the species polygon encompasses all zones. Targeted surveys for the species scheduled for optimal survey period (Dec - Jan).	Zone 1: 41.5 Zone 3: 16.6 Zone 4: 41.3 Zone 5: 0.3
N/A	<i>Euphrasia arguta</i>	Very High (3)	Yes	Associated with species present within the subject land.	N/A	Zone 3: 0.03 ha Zone 4: 0.03 ha Zone 5: 0.08 ha	Potential habitat for this species occurs in zones of the subject land that have not yet been surveyed, Zones 3, 4 and 5. As such, the species polygon encompasses these zones. Targeted surveys for the species within these zones are scheduled for optimal survey period (Nov - Mar).	Zone 3: 16.6 Zone 4: 41.3 Zone 5: 0.3

Common name	Scientific name	Biodiversity risk weighting	SAII entity	Habitat constraints / microhabitats present on the subject land / vegetation zone	Abundance	Extent (ha) of suitable habitat present on site	Species specific recommendations e.g. buffers, general comments and species polygons	Habitat condition (VI score)
Fauna								
Gang-gang Cockatoo (Breeding)	<i>Callocephalon fimbriatum</i>	High (2)	No	Nest trees- Eucalypts with hollows at least 3 m above the ground and a hollow diameter of 7 cm of larger.	N/A	Zone 1: 0.03 ha	Surveys are required to look for signs of breeding and determine presence of potential nest trees. In the interim, presence is assumed, a species polygon encompasses Zone 1, in which potential nest trees are present.	Zone 1: 41.5
South-eastern Glossy Black Cockatoo (Breeding)	<i>Calyptorhynchus lathami lathami</i>	High (2)	No	Nest trees – living or dead trees with hollows greater than 15 cm diameter and higher than 8 m above the ground.	N/A	Zone 1: 0.03 ha	Surveys are required to look for signs of breeding and determine presence of potential nest trees. In the interim, presence is assumed, a species polygon encompasses Zone 1, in which potential nest trees are present.	Zone 1: 41.5
Key's Matchstick Grasshopper	<i>Keyacris scurra</i>	High (2)	No	Associated with native grassy understory and known native and exotic plant foods present within subject land.	N/A	Zone 1: 0.03 ha Zone 3: 0.03 ha Zone 4: 0.03 ha Zone 5: 0.08 ha	Targeted surveys are required to determine presence of the species within the subject land, in the interim presence is assumed. Potential habitat for this species occurs in all zones of the subject land. As such, the species polygon encompasses all zones.	Zone 1: 41.5 Zone 3: 16.6 Zone 4: 41.3 Zone 5: 0.3
Pink Cockatoo (Breeding)	<i>Lophochroa leadbeateri</i>	High (2)	No	Nest trees – living or dead trees with hollows greater than 10 cm diameter.	N/A	Zone 1: 0.03 ha	Surveys are required to look for signs of breeding and determine presence of potential nest trees. In the interim, presence is assumed, a species polygon encompasses Zone 1, in which potential nest trees are present.	Zone 1: 41.5
Barking Owl	<i>Ninox connivens</i>	High (2)	No	Nest trees – living or dead tree with a hollow greater than 20 cm diameter that occurs greater than 4 m above the ground.	N/A	Zone 1: 0.03 ha Zone 3: 0.03 ha Zone 4: 0.03 ha Zone 5: 0.08 ha	Surveys are required to detect and determine presence of species. If detection occurs, an 800 m buffer around a detected owl is to be created to encompass the species approximate home range. In the interim, presence is assumed, and a species polygon must be applied to include all vegetation zones.	Zone 1: 41.5 Zone 3: 16.6 Zone 4: 41.3 Zone 5: 0.3
Squirrel Glider	<i>Petaurus norfolcensis</i>	High (2)	No	Inhabits old growth Box, Box-Ironbark woodlands and River Red Gum forests west of the Great Dividing	N/A	Zone 1: 0.03 ha Zone 4: 0.03 ha	No specific comments. Species polygon covers potential nesting (e.g., hollows) and foraging (e.g., eucalypt pollen) microhabitat found in Zone 1 and 4.	Zone 1: 41.5 Zone 4: 41.3

Common name	Scientific name	Biodiversity risk weighting	SAII entity	Habitat constraints / microhabitats present on the subject land / vegetation zone	Abundance	Extent (ha) of suitable habitat present on site	Species specific recommendations e.g. buffers, general comments and species polygons	Habitat condition (VI score)
				Range. Species requires tree hollows for refuge and nest sites.				
Squirrel Glider in the Wagga Wagga Local Government Area	<i>Petaurus norfolcensis – endangered population</i>	High (2)	No	Relies on large old trees with hollows for breeding and nesting, with these trees typically no more than 50 m apart.	N/A	Zone 1: 0.03 ha Zone 4: 0.03 ha	No specific comments. Species polygon covers potential nesting (e.g., hollows) and foraging (e.g., eucalypt pollen) microhabitat found in Zone 1 and 4.	Zone 1: 41.5 Zone 4: 41.3
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	High (2)	No	Inhabits a range of diverse habitats including dry sclerophyll open forest, wet sclerophyll forest and rainforest. May occur without hollow-bearing trees, therefore this is not a constraint for the species.	N/A	Zone 1: 0.03 ha Zone 4: 0.03 ha	Reliable detection of the species through survey is difficult and requires specific baited camera specifications. In the interim, presence is assumed. A species polygon has been drawn around the outer edge of the associated vegetation zone which cover potential nesting (e.g., hollows) and foraging (e.g., eucalypt pollen) microhabitat found in Zone 1 and 4.	Zone 1: 41.5 Zone 4: 41.3
Koala	<i>Phascolarctos cinereus</i>	High (2)	No	Potential Koala use trees as outlined in 'Koala (<i>Phascolarctos cinereus</i>): Biodiversity Assessment Method Survey Guide' for the Riverina are present within subject land (<i>E. microcarpa</i>).	N/A	Zone 1: 0.03 ha Zone 4: 0.03 ha	The 'Koala (<i>Phascolarctos cinereus</i>): Biodiversity Assessment Method Survey Guide for information on targeted survey requirements and mapping species polygons' suggests a species polygon should encompass areas of the subject land that include Koala use trees. As such species polygon has been applied to include Zones 1 and 4.	Zone 1: 41.5 Zone 4: 41.3
Superb Parrot (Breeding)	<i>Polytelis swainsonii</i>	High (2)	No	Nesting trees – living or dead tree species that include but not limited to <i>E. microcarpa</i> , with hollows greater than 5 cm in diameter and greater than 4 m above the ground.	N/A	Zone 1: 0.03 ha	Surveys are required to look for signs of breeding and determine presence of potential nest trees. In the interim, presence is assumed, a species polygon encompasses Zone 1, in which potential nest trees are present.	Zone 1: 41.5
Golden Sun Moth	<i>Synemon plana</i>	Moderate (1.5)	No	Inhabits grassy understory with Wallaby grass,	N/A	Zone 1: 0.03 ha Zone 3: 0.03 ha Zone 4: 0.03 ha	Targeted surveys are required to determine presence of the species within the subject land, in the interim presence is assumed. Potential habitat	Zone 1: 41.5 Zone 3: 16.6 Zone 4: 41.3

Common name	Scientific name	Biodiversity risk weighting	SAI entity	Habitat constraints / microhabitats present on the subject land / vegetation zone	Abundance	Extent (ha) of suitable habitat present on site	Species specific recommendations e.g. buffers, general comments and species polygons	Habitat condition (VI score)
				Speargrass or Chilean needlegrass.		Zone 5: 0.08 ha	for this species occurs in all zones of the subject land. As such, the species polygon encompasses all zones.	Zone 5: 0.3
Masked Owl	<i>Tyto novaehollandiae</i>	High (2)	No	Nest trees – living or dead tree with a hollow greater than 20 cm diameter that occurs greater than 4 m above the ground.	N/A	Zone 1: 0.03 ha Zone 3: 0.03 ha Zone 4: 0.03 ha Zone 5: 0.08 ha	Surveys are required to detect and determine presence of species. If detection occurs, an 800 m buffer around a detected owl is to be created to encompass the species approximate home range. In the interim, presence is assumed, and a species polygon must be applied to include all vegetation zones.	Zone 1: 41.5 Zone 3: 16.6 Zone 4: 41.3 Zone 5: 0.3

TABLE 16: RESULTS FOR EPBC ACT LISTED SPECIES PRESENT (OR ASSUMED PRESENT)

Common name	Scientific name	Abundance	Extent (ha) of suitable habitat present on site
Flora			
A Spear-grass	<i>Austrostipa wakoolica</i>	N/A (assumed present)	0.17 ha
Small Scurf-pea	<i>Cullen parvum</i>	N/A (assumed present)	0.17 ha
N/A	<i>Euphrasia arguta</i>	N/A (assumed present)	0.17 ha
Fauna			
Gang-gang Cockatoo (Breeding)	<i>Callocephalon fimbriatum</i>	N/A (assumed present)	0.03 ha
South-eastern Glossy Black Cockatoo (Breeding)	<i>Calyptorhynchus lathami lathami</i>	N/A (assumed present)	0.03 ha
Key's Matchstick Grasshopper	<i>Keyacris scurra</i>	N/A (assumed present)	0.17 ha
Pink Cockatoo (Breeding)	<i>Lophochroa leadbeateri</i>	N/A (assumed present)	0.03 ha
Barking Owl	<i>Ninox connivens</i>	N/A (assumed present)	0.17 ha
Squirrel Glider	<i>Petaurus norfolcensis</i>	N/A (assumed present)	0.06 ha
Squirrel Glider in the Wagga Wagga Local Government Area	<i>Petaurus norfolcensis – endangered population</i>	N/A (assumed present)	0.06 ha
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	N/A (assumed present)	0.06 ha
Koala	<i>Phascolarctos cinereus</i>	N/A (assumed present)	0.06 ha
Superb Parrot (Breeding)	<i>Polytelis swainsonii</i>	N/A (assumed present)	0.03 ha
Golden Sun Moth	<i>Synemon plana</i>	N/A (assumed present)	0.17 ha
Masked Owl	<i>Tyto novaehollandiae</i>	N/A (assumed present)	0.17 ha

6. Identifying prescribed impacts

Prescribed impacts are those that may affect biodiversity values in addition to, or instead of, impacts from clearing vegetation. This BDAR has identified the potential for prescribed impacts as shown in **Table 17**. An assessment of the prescribed impacts of the proposal on threatened entities and their habitat is provided in **Section 8.3**.

TABLE 17: PRESCRIBED IMPACTS IDENTIFIED

Feature	Present	Description of feature characteristics and location	Threatened entities that use, are likely to use, or are part of the habitat feature or fauna that are that are at risk of vehicle strike.
Karst, caves, crevices, cliffs, rocks, or other geological features of significance	No	No karsts, caves, crevices, large rocks, tors, or cliffs are known or were observed within the subject land. No bush rock or surface rock were observed within the subject land during field inspection for this BDAR. Furthermore, the original BDAR documents no occurrences of surface rock in the approved development site.	N/A
Human-made structures	Yes	Agricultural fences along the eastern and southern boundaries.	All threatened bird species assessed as fences may be used as minor perching habitat.
Non-native vegetation	Yes	Exotic species were recorded in the ground layer and included a moderate amount of forb and pasture grass species such as Barley Grass (<i>Hordeum leporinum</i>), Bromes (<i>Bromus</i> spp.) and Oats (<i>Avena</i> sp.).	Southern Whiteface Dusky Woodswallow Speckled Warbler Spotted Harrier Black Falcon Little Eagle Square-tailed Kite South-eastern Hooded Robin Barking Owl Gilbert's Whistler Scarlet Robin Flame Robin Superb Parrot Diamond Firetail Masked Owl Rosenberg's Goanna
Category-1 exempt land	Yes	Vegetation Zone 2 (Figure 11)	All threatened fauna identified for further assessment in Section 5 .
Habitat connectivity	Yes	The subject land contains woodland, grassland and riparian areas that are connected to connected to substantial areas of higher quality habitat within the surrounding landscape.	All threatened fauna species assessed. Level of habitat connectivity use differs based on species behaviour and habitats available within the subject land.
Waterbodies, water quality and hydrological processes	Yes	The subject land is relatively flat and likely becomes moderately inundated during heavy rain fall, with an ephemeral drainage line passing from east to west through the centre into an adjacent artificial Dam. Overflow from this dam would likely flow into Boiling Down Creek (Figure 1).	N/A
Wind turbine strikes	No	The proposed development is not a wind farm development.	N/A
Vehicle strikes	Yes	Internal road, and increased traffic movement.	Low to moderate risk: All threatened fauna species assessed.

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

7. Avoid and minimise impacts

Chapter 7 of the BAM outlines strategies and actions that may be taken to avoid or minimise impacts on biodiversity values during proposal planning. A summary of efforts taken to avoid and/or minimise impacts on native vegetation and associated habitat is addressed in the sections below.

7.1. Avoid and minimise direct and indirect impacts

7.1.1. PROPOSAL LOCATION

The access point and access track have been located to ensure that the approved overhead and underground transmission line for Gregadoo Solar Farm can be constructed and maintained without adverse impacts to Boiling Down Creek or the adjoining riparian corridor.

7.1.2. PROPOSAL DESIGN

Knowledge of biodiversity values have informed decisions about the final design of the proposal. Existing and proposed future use of the land indicates relatively limited foreseen long-term viability of understory vegetation within the subject land. However, trees remaining in the subject land provide important habitat and localised connectivity for native and threatened fauna (particularly aerial and arboreal species). The proposed modification has been designed to avoid tree removal and subsequently impacts to Vegetation Zone 1. Overall, the proposed modification has been designed to avoid impacts to areas of high biodiversity value by utilising Vegetation Zone 2 (category 1-exempt land).

Remaining works are requirements for road upgrade and were assessed to allow for consideration of the likely extent of impact associated with Over Size Over Mass (OSOM) vehicle movements. Avoidance measures were considered, and impact areas sited to limit tree removal for these works.

7.2. Avoid and minimise prescribed impacts

The measures described above apply to minimising the prescribed impacts to habitat connectivity. Furthermore, appropriate crossings will be constructed over the ephemeral drainage line as per NSW Fisheries guidelines (Fairfull and Witheridge, 2003) assist in avoiding and minimising impacts to water quality and hydrological processes.

7.3. Other measures considered

No other measures have been considered for the proposed modification. Recommended measures for mitigation of identified biodiversity impacts are discussed in **Section 8.4**.

8. Impact assessment

8.1. Direct impacts

Primary and direct impacts of the proposal are the loss of native vegetation and associated habitats within the subject land. Direct impacts include the clearing or otherwise direct disturbance to up to 0.54 ha of vegetation and associated habitats for native fauna, and threatened species outlined throughout this report, as a result of proposed internal road construction works and subsequent traffic as presented in **Figure 4, Figure 5, Figure 15**. This is inclusive of:

- 0.5 ha of PCT 76 modified grassland (Vegetation Zone 2),
- 0.01 ha of PCT 76 derived native grassland which includes two saplings (less than 5 DBH) of Grey Box (Vegetation Zone 3),
- 68 m² of PCT 277 planted vegetation composed (Vegetation Zone 4),
 - Up to four trees that are not Box Gum Woodland associated species (between the DBH of ~10-30) and not containing habitat features at the time of inspection such as nests or hollows.
- 0.02 ha of PCT 277 modified grassland (Vegetation Zone 5).

8.1.1. INLAND GREY BOX WOODLAND

The total direct impacts to PCT 76 and consequently the Inland Grey Box Woodland EEC is expected to be up to 0.5 ha of degraded grassland as described above and presented in **Table 18**.

TABLE 18: EXTENT OF VEGETATION IMPACTS AND CHANGE IN VEGETATION INTEGRITY SCORE

Vegetation Zone	PCT ID	PCT % Cleared within NSW	TEC	SAIL entity	Extent to be removed	Before development	After development	Change
						VI score	VI Score	Change in VI score
Zone 1	76	92.10	Inland Grey Box Woodland in the Riverina, NSW	No	-	41.5	41.5	0
Zone 2	76	92.10	South Western Slopes, Cobar	No	0.50	13.5	0	-13.5
Zone 3	76	92.10	Penepplain, Nandewar and Brigalow Belt South Bioregions	No	0.01	16.6	0	-16.6
Total					0.51 ha			

TABLE 19: SUMMARY OF RESIDUAL DIRECT IMPACTS

Direct impact	Species or TEC	BC Act status	EPBC Act status	SAIL entity	Project phase/timing of impact	Extent (ha)
TECs						
Clearing of native vegetation and associated habitat.	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Penepplain, Nandewar and Brigalow Belt South Bioregions	Endangered Ecological Community	n/a	No	Construction, operation	0.51 ha

Direct impact	Species or TEC	BC Act status	EPBC Act status	SAIL entity	Project phase/timing of impact	Extent (ha)
Species						
Clearing of native vegetation and associated habitats.	Ecosystem and species credit species identified for further assessment or assumed present throughout this report.	n/a	n/a	Associated with TEC SAIL above	Construction, operation	0.51 ha

8.1.2. BOX GUM WOODLAND

The total direct impacts to PCT 277 and consequently the Box Gum Woodland CEEC is expected to be up to 0.02 ha of degraded grassland 68 m² of planted woodland as described above and presented in **Table 20**.

TABLE 20: EXTENT OF VEGETATION IMPACTS AND CHANGE IN VEGETATION INTEGRITY SCORE

Vegetation Zone	PCT ID	PCT % Cleared within NSW	TEC	SAIL entity	Extent to be removed	Before development	After development	Change
						VI score	VI Score	Change in VI score
Zone 4	277	94	Box Gum Woodland – NSW listed	Yes	0.0068	43.1	0	-43.1
Zone 5	277	94		Yes	0.02	0.3	0	-0.3
Total					0.027 ha			

TABLE 21: SUMMARY OF RESIDUAL DIRECT IMPACTS

Direct impact	Species or TEC	BC Act status	EPBC Act status	SAIL entity	Project phase/timing of impact	Extent (ha)
TECs						
Clearing of native vegetation and associated habitat.	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 Ecological Community	n/a	Yes	Construction, operation	0.0268 ha
Species						
Clearing of native vegetation and associated habitats.	Ecosystem and species credit species identified for further assessment or assumed present throughout this report.	n/a	n/a	Associated with TEC SAIL above	Construction, operation	0.0268 ha

8.2. Indirect impacts

Indirect impacts are development related activities not associated with clearing for the development footprint and often:

- occur beyond the development footprint or even the development site,
- have a lower or variable intensity of impact compared to direct impacts,
- may be harder to predict spatially and temporally, and
- may have unclear boundaries of responsibility.

Despite uncertainty, indirect impacts are to be considered in the site selection, design, and operational phases of the proposed development. Indirect impacts are likely to occur across the entire subject land where areas of native vegetation and habitats remain following final construction footprint and management for bushfire protection requirements. Indirect impacts likely to occur for the proposed development include but may not be limited to those outlined in **Table 22**.

TABLE 22: SUMMARY OF RESIDUAL INDIRECT IMPACTS

Indirect impact	Impacted entities	Extent	Frequency	Duration of impact	Project phase/ timing of impact	Likelihood and consequences
Inadvertent impacts on adjacent habitat or vegetation	Inland Grey Box Woodland and associated flora and fauna species. Box Gum Woodland and associated flora and fauna species.	Unclear. Estimated 30 m buffer from subject land (see Figure 15).	Ongoing	Long-term	Construction and operation	Moderate. Inadvertent impacts on adjacent habitat or vegetation may occur during construction, however, can be prevented or minimised through appropriate exclusion fencing and implementation of a site-specific Construction Environmental Management Plan and Erosion and Sediment Control Plan. Inadvertent impacts on adjacent habitat or vegetation during operation (as solar farm access roads) are more difficult to quantify, however may be mitigated by appropriate development controls such as long-term exclusion fencing preventing access to adjacent lands.
Transport of weeds and pathogens from the site to adjacent vegetation	Inland Grey Box Woodland and associated flora and fauna species. Box Gum Woodland and associated flora and fauna species.	Unclear. Estimated 30 m buffer from subject land (see Figure 15).	Ongoing	Long-term	Construction and operation	Moderate. Reduced condition of the TEC on adjoining land. Increased visitation and disturbances to vegetation during construction may increase the likelihood that weeds and pathogens on site are spread into adjacent vegetation. However, this would be managed by weed and pathogen mitigation measures outlined in the Construction Environmental Management Plan. Landscaping and ongoing vegetation management can assist with reducing the chance of weeds on site. However, increased visitation (solar farm employees) may introduce new weeds to the area.
Reduced viability of adjacent habitat due to edge effects	Inland Grey Box Woodland and associated flora and fauna species. Box Gum Woodland and associated flora and fauna species.	Unclear. Estimated 30 m buffer from direct disturbance footprint (see Figure 15).	Ongoing	Long-term	Construction and operation	Moderate. Adjacent vegetation habitats are currently subject to a moderate degree of edge effects due to surrounding existing agricultural and substation land use. Adjacent areas to the north and south appear to already be in a degraded condition due to existing land use. However, land to the east and west appears to be of higher quality and would likely be more susceptible to increased edge effects as a result of the proposal. Edge effects include fragmentation which breaks habitat continuity and has the potential to reduce reproductive success of localised species and regeneration potential of plants associated with the TEC.
Rubbish dumping	Inland Grey Box Woodland and associated flora and fauna species. Box Gum Woodland and associated flora and fauna species.	Remaining and surrounding vegetated areas.	Ongoing	Long-term	Construction and operation	Moderate. Dumping of rubbish (from construction or increased human visitation during operation) risks fauna safety and has potential to smother/choke native vegetation. Standard construction environmental controls and council waste collection would address this and ensure controls include sufficient rubbish bins, regular collection and signage erected warning guests and workers.

Indirect impact	Impacted entities	Extent	Frequ-ency	Duration of impact	Project phase/ timing of impact	Likelihood and consequences
Reduced viability of adjacent habitat due to noise, dust, or light spill	Inland Grey Box Woodland and associated flora and fauna species. Box Gum Woodland and associated flora and fauna species.	< 10 ha	Ongoing	Long-term	Construction and operation	Moderate. Effects of light, noise, and dust on retained areas and adjacent landscape and resident fauna. Impacts attributed to dust from the construction of the proposal can be managed through appropriate control measures, such as the use of water carts, strategies can be implemented in a site-specific Construction Environmental Management Plan.
Increase in predatory and pest species populations	Ecosystem credit fauna.	Unclear	Ongoing	Long-term	Construction and operation	Low. Introduced predators are likely to already exist in the landscape, with foxes, rabbits, starlings and cats already detected within the subject land. The intended land use during operation of the proposal (access road) is unlikely to increase the presence of introduced predators such as cats, dogs (released pets), foxes and rats.
Increased risk of fire	Inland Grey Box Woodland and ecosystem credit species identified for further assessment in Table 10.	Unclear	Ongoing	Long-term	Operation	Moderate. Linked to an increase in visitation.

8.3. Prescribed impacts

8.3.1. KARST, CAVES, CREVICES, CLIFFS, ROCKS, OR OTHER GEOLOGICAL FEATURES OF SIGNIFICANCE

No karsts, caves, crevices, large rocks, tors, or cliffs are known or were observed to be present within the subject land.

8.3.2. HUMAN-MADE STRUCTURES

8.3.2.1. NATURE

Human-made structures within the subject land include barbed wire agricultural fences along the eastern and southern boundary and high voltage powerlines crossing the subject land from east to west. The fences provide low quality minor perches for threatened and native bird species, primarily small woodland birds. The high voltage powerlines provide roosting for a range of raptor species that also may use them for hunting perches.

8.3.2.2. EXTENT

The extent of these features is considered minor. The location of existing barbed wire fencing is along the eastern and southern boundaries as shown in **Figure 1** and **Photo 8**. The eastern boundary fence will not be impacted. Although the southern boundary fence will be removed, it is likely to eventually be replaced, and a gate installed to provide access. There are no proposed changes to the high voltage powerlines.

8.3.2.3. DURATION

The removal of the southern boundary fence is likely to be temporary as it will likely be replaced with new fencing and a gate.

8.3.2.4. CONSEQUENCES

The existing fence provides only low quality and minor perching habitat for bird species, particularly small woodland birds. The removal of existing fencing is not expected to have any significant consequences.

PHOTO 8: EXAMPLE OF SOUTHERN FENCE



8.3.3. NON-NATIVE VEGETATION

8.3.3.1. NATURE

The subject land contains abundant exotic vegetation due to it being historically utilised as an agricultural property with modified pastures for grazing. Roadside verge sections of the subject land are also largely composed of exotic vegetation due to them mostly being managed (e.g. slashed and mowed) and adjacent to agricultural pastures. Non-vegetation occurs as exotic grasses and forbs throughout the subject land, which may be used for foraging, dispersal and shelter for a variety of threatened and native fauna species including but not limited to species assumed present in **Section 5**.

8.3.3.2. EXTENT

The proposed development will clear up to 0.53 ha of predominately exotic understory across the Vegetation Zones 2 (0.5 ha), 3 (0.01 ha) and 5 (0.02 ha).

8.3.3.3. DURATION

The removal of non-native vegetation in the subject land will be permanent.

8.3.3.4. CONSEQUENCES

Only exotic grasses and forbs will be cleared for the proposal, which provide low quality habitat for native fauna species. As the subject land is already highly degraded and the extent of understory cleared is minor compared to that which is still available in the surrounding landscape, the removal of exotic understory vegetation is not expected to have any significant consequence.

PHOTO 9: EXAMPLE OF MODIFIED PASTURES



8.3.4. CATEGORY 1-EXEMPT LAND

8.3.4.1. NATURE

Vegetation Zone 2 within the subject land has been confirmed to align with category 1-exempt land (see **Section 1.3**). Vegetation Zone 2 may be used, particularly for foraging, for a variety of threatened species and native fauna, including but not limited to species assumed present in **Section 5**.

8.3.4.2. EXTENT

The proposed development will clear up to 0.50 ha of category 1-exempt land.

8.3.4.3. DURATION

The removal of native vegetation and associated habitat within defined category 1-exempt land will be permanent.

8.3.4.4. CONSEQUENCES

As Vegetation Zone 2 within the subject land is already highly degraded and the extent of understory to be cleared is minor compared to that which is still available in the surrounding landscape, the removal of any native vegetation and associated habitat situated within defined category 1-exempt land is not expected to have any significant consequence. A range of measures have been proposed to mitigate impacts of the proposed modification as presented in **Section 8.4**.

8.3.5. HABITAT CONNECTIVITY

8.3.5.1. NATURE

The subject land and assessment area are located on historically modified rural agricultural land on the outskirts of the urbanised and developed township of Wagga Wagga. It also further encompasses roadsides of Ashfords Road, Bakers Lane, Boiling Down Creek Road and adjacent planted vegetation. However, the subject land still provides localised connectivity through substantial patches of remnant woodland and planted vegetation that connects to the surrounding landscape that may serve as movement corridors for threatened ground-dwelling species, arboreal mammals, and aerial species. Riparian habitat also occurs within the subject land that connects to Boiling Down Creek and eventually Coxs Creek.

8.3.5.2. EXTENT

The extent of impacts on connectivity differs in relation to each species and their habitat requirements. Approximately 0.30 ha of the subject land consists of small, scattered patches of native woody vegetation within Vegetation Zone 1 and 0.03 ha of Vegetation Zone 4 planted overstorey vegetation that offers greater habitat connectivity given the density and extent of plantings. Furthermore, limited woody vegetation will be removed for the proposed development, which includes up to four non-PCT associated planted trees from Vegetation Zone 4 and two regenerating saplings of Grey Box from Vegetation Zone 3. Additionally, the proposed access road passes through the ephemeral drainage line located in Vegetation Zone 2.

8.3.5.3. DURATION

The reduction of habitat connectivity is considered a long-term impact, in the absence of efforts to retain connectivity in the subject land.

8.3.5.4. CONSEQUENCES

Clearing of native vegetation and the construction of urban infrastructure is likely to have a localised disruption of connectivity for less mobile and disturbance-intolerant ground-dwelling, arboreal and aerial fauna. Furthermore, the proposal is likely to limit the use of the subject land for less mobile and disturbance-intolerant species. Consequently, the proposal would introduce a barrier for the localised movement of these species.

The proposal will have a minor impact on woody vegetation, with up to four non-PCT associated plantings from Vegetation Zone 4 and two regenerating saplings of Grey Box from Vegetation Zone 3 to be removed, thus largely retaining woody vegetation within the subject land. The proposed primary access road has been cited only in degraded grassland (Vegetation Zone 2) and avoids impacts to trees in adjacent Vegetation Zone 1. Appropriate crossings will be constructed over the ephemeral drainage line as per NSW Fisheries guidelines (Fairfull and Witheridge, 2003). Furthermore, given the historical clearing within the subject land and immediate surrounds, the subject land is unlikely to serve as a key movement corridor. Habitat connectivity would remain relatively unchanged at the broader landscape scale, with the primary connectivity corridor in the area occurring directly adjacent to the subject land in the vicinity of Boiling Down Creek and the plantation (Vegetation Zone 4), which retains a greater condition of habitat and canopy cover.

8.3.6. WATERBODIES, WATER QUALITY AND HYDROLOGICAL PROCESSES

8.3.6.1. NATURE

The subject land contains an artificial farm dam in the southeastern corner and an ephemeral drainage line that is found in the northern half. Additionally, there is another artificial farm dam located directly north of the subject land (**Figure 1**). The ephemeral drainage line flows southeast to northwest through the northern section of the subject land, it did not contain any water at the time of inspection however, it contains some riparian vegetation and would likely flood during rain events (**Photo 10**). Both artificial farm dams were observed to provide low quality habitat (**Photo 11** and **Photo 12**), they were degraded by stock use and contained little to no fringing riparian vegetation. A Dam Yabby (*Cherax destructor*) claw was observed on the banks of the northern artificial farm dam, it is likely that the species occurs in both dams.

The Groundwater Dependent Ecosystems Atlas (2023) does not identify the subject land or immediate surrounds as potential aquatic or terrestrial Groundwater Dependent Ecosystems.

8.3.6.2. EXTENT

The proposed access road passes through the ephemeral drainage line and will not directly impact the artificial farm dam. The splash crossing is unlikely to substantially impact connectivity through the riparian zone in the long term. A short-term disruption to connectivity during construction is inevitable although not considered a significant impact.

The extent of construction impacts is difficult to quantify, however, will be mitigated through industry standard construction environmental controls aimed at preventing sedimentation, pollution, and erosion.

The extent of operational impacts is difficult to quantify, however, the proposed development will follow NSW Fisheries guidelines on constructing the crossing over the ephemeral drainage line (Fairfull and Witheridge, 2003), which will assist in avoiding and minimising long-term impacts to water quality and hydrological processes.

8.3.6.3. DURATION

The duration of construction impacts is likely to last until the completion of the development. Potential operational impacts are likely to continue into the long-term use of the subject land.

8.3.6.4. CONSEQUENCES

The proposal has potential to impact water quality and hydrological processes in the absence of appropriate measures to control erosion, sedimentation, and pollution during the construction of the development including future residential development.

PHOTO 10: DRAINAGE LINE IN DEVELOPMENT FOOTPRINT



PHOTO 11: SOUTHERN DAM



PHOTO 12: NORTHERN DAM



PHOTO 13: BOILING DOWN CREEK



8.3.7. VEHICLE STRIKES

While an internal road will be created for the proposal, the construction and operation of the proposal is a low to moderate risk of vehicle strike on threatened species. Although a new road will be constructed and there will be increased traffic through the subject land, the majority of the threatened species assumed present have a low likelihood of being impacted by vehicle strikes due to their behavioural patterns and the open vegetation providing clear visibility.

One threatened fauna species Rosenberg's Goanna, (*Varanus rosenbergi*) is assessed as a low to moderate risk of vehicle strike, The Rosenberg's Goanna is at moderate risk of vehicle strike though this is mitigated with reduced speed limits and it being a large species. Other recommended mitigation measures by NSW DCCEEW to change driver behaviour to reduce wildlife vehicle strike include reduced speed limits.

8.4. Mitigating residual impacts – management measures and implementation

The proponent will develop a range of measures for the proposal in order to mitigate impacts unavoidable by location and redesign as outlined in **Chapter 7**. These include measures to be undertaken before, during and after construction to mitigate the direct impacts of the proposal. Measures include the development and implementation of detailed plans which may include, although not be limited to a Construction Environmental Management Plan (CEMP), Erosion and Sediment Control Plan (ESCP), and other required management plans as directed by conditions of consent.

An unexpected finds and fauna recovery procedure should be included in the CEMP, in the event a threatened species is encountered, or fauna injured, during construction.

It is expected that mitigation measures will form part of the conditions of consent for the proposal and all measures will be approved or endorsed by the determining authority as part of the development application process. The proposed measures described below and summarised in **Table 23** have been identified to manage construction and operational impacts of the proposal to biodiversity.

8.4.1. CONSTRUCTION MITIGATION MEASURES

8.4.1.1. CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

A CEMP will be required for the construction phase and will be prepared prior to issue of the Construction Certificate. The CEMP would include, at a minimum, industry-standard measures for management of environmental factors (i.e., soil, surface water, weeds, pathogens, and pollutants) as well as site-specific measures, including the procedures outlined below.

8.4.1.2. SITE DELINEATION AND DEMARCATION

DELINEATION OF CONSTRUCTION FOOTPRINT AND AREAS TO BE PROTECTED

To reduce the chance of inadvertent degradation of adjacent vegetation and habitat, the boundary of the development footprint will be clearly delineated with appropriate fencing. Clear exclusion zones should also be established for all areas to be protected including the ephemeral drainage line (Error! Reference source not found.) and patches of Inland Grey Box Woodland EEC (**Figure 12**) identified in this BDAR. A suitably qualified ecologist should be present during the establishment of these zones, which are to utilise clear signage and physical markers such as temporary fencing or ropes (example in **Photo 14**). Ancillary works such as parking, stockpiling and site compounds are to be kept outside of these exclusion zones.

PHOTO 14: EXAMPLE OF TEMPORARY FENCING OR ROPES



8.4.1.3. FAUNA AND HABITAT MANAGEMENT

PRE-CLEARING ASSESSMENT

Before clearing works begin a pre-clearing survey will be undertaken by a qualified ecologist, with all key habitat features (e.g., nests, and burrows) and fauna utilising the proposed work area recorded and mapped. A subsequent pre-clearing inspection report will be prepared to include a list of findings, clearing recommendations and suitable areas identified for relocating displaced fauna, to reduce the potential impact on residing fauna.

A qualified ecologist is then to supervise the clearing procedure, and where recommended, rescue and relocate residing fauna in accordance with the pre-clearing report. All fauna rescues and relocations are to be documented with the location of rescue and relocation.

8.4.1.4. EROSION, SEDIMENTATION AND POLLUTION CONTROL

The proposal may result in erosion and transport of sediments into the ephemeral drainage line and further offsite to Boiling Down Creek, as a result of, soil disturbance and spills during construction. To reduce sedimentation and pollution during construction, erosion and chemical contaminant control measures will be implemented in accordance with “The Blue Book” (Landcom 2004). This includes the following:

- minimising the amount of exposed soil,
- installation of sediment control fences,
- covering soil stockpiles,
- ensure stockpiles are located well away (at least 40 m) from the ephemeral drainage line or other drainage lines,
- avoiding soil disturbance prior to heavy rainfall,
- precautions for fast and effective containment of pollution, such as:
 - pollution traps,
 - spill kits, and
 - removal of pollution to an off-site location.

To avoid potential indirect impacts during construction, it is recommended that an ESCP should be in place following best practices (e.g., Landcom, 2004) and be included in the site-specific CEMP, prior to any construction works taking place.

8.4.1.5. WEED, PATHOGEN AND DISEASE MANAGEMENT

Clearing and construction works can result in the spread of weeds, pathogens and diseases throughout a site or lead to their introduction to an area. In order to minimise the spread of weeds, pathogens and diseases, monitoring, management, and control is to be aligned with relevant legislation and recommendations including the NSW *Biosecurity Act 2015* and the Riverina East Regional Strategic Weed Management Plan 2023-2027.

The subject land currently exhibits evidence of invasive weeds, with Vegetation Zones of higher disturbance and little to no canopy present generally displaying higher rates of invasive species. Importantly, invasive weeds categorised as Weeds of National Significance and High Threat Exotics were identified within the subject land and immediate surrounds including:

- Blackberry (*Rubus fruticosus* sp. agg.) – WoNS and State Priority Weed,
- Black Willow (*Salix nigra*) – WoNS and State Priority Weed,
- African Lovegrass (*Eragrostis curvula*) – HTE,
- Bathurst Burr (*Xanthium spinosum*) – HTE,
- Common Olive (*Olea europaea*) – HTE,
- Great Broome (*Bromus diandrus*) – HTE,
- Khaki Weed (*Alternanthera pungens*) – HTE,
- Kikuyu Grass (*Pennisetum clandestinum*) – HTE,
- Lippia (*Phyla canescens*) – HTE,
- Paspalum (*Paspalum dilatatum*) – HTE,
- Saffron Thistle (*Carthamus lanatus*) – HTE,
- St John's Wort (*Hypericum perforatum*) – HTE, and
- Umbrella Sedge (*Cyperus eragrostis*) – HTE.

Pathogen spread can cause disease and the weakening of an ecosystem's flora and fauna. Microorganisms causing such diseases can be spread by machinery, vehicles or footwear and preventative measures should be in place to prevent the introduction to the subject land. Pathogens may include:

- *Phytophthora cinnamomi*, a root-rot fungus that infects native vegetation causing dieback and is listed as a key threatening process under the EPBC Act.
- Chytrid Fungus (*Batrachochytrium dendrobatidis*), a fungal disease that affects amphibians, thought to be causing the decline of some frog species worldwide, including the Alpine Tree Frog and the Booroolong Frog.
- Myrtle Rust (*Austropuccinia psidii*), a fungal disease infecting soft, actively growing parts of plants within the Myrtaceae family (eucalypts, bottlebrush etc.).

Prevention and early intervention are the most effective strategies to manage weed, pathogen and disease spread. The following strategies will be prompted early in the development of environmental management plans (e.g., CEMP and/or BMP) with robust communication between responsible parties to ensure controls are managed in a strategic and coordinated manner across the subject land:

- identification, mapping, and treatment of priority weeds before clearing commences,
 - manual weed removal is preferable to the use of herbicides where appropriate,

- advise all workers and visitors of biosecurity measures in place,
- weed infested plant material to be disposed of in accordance with waste management legislation,
 - e.g., appropriate disposal of weed material, including seeds, into bags or plastic sheeting to prevent the spread of existing weed species,
- hygiene controls such as cleaning and inspecting for soil or organic material on plant, equipment, and clothing prior to site arrival, including clean vehicles and tyres,
- implement frog hygiene and pest control protocols, and
- control the movement of plant, equipment, and workers to minimise the potential for the spread of weeds within and outside the subject land.

8.4.2. POST CONSTRUCTION AND OPERATION MITIGATION MEASURES

8.4.2.1. POST-CLEARING ASSESSMENT

A post-clearing assessment will be undertaken to confirm the final impact of this development. Following the completion of construction, a post-clearing inspection is to be undertaken by a qualified ecologist to verify the actual clearing footprint to ensure that clearing has not occurred beyond the marked development footprint. The results of the post-clearing inspection will seek to inform the accuracy of the project's credit obligation.

The post-clearing inspection will ground-truth the areas that have been disturbed by the proposal, with a focus on areas identified as Vegetation Zone 1, as reflected in this BDAR. A post-clearing inspection report will be prepared by a qualified ecologist following the completion of the post-clearing inspection, including the result of the inspection including photos and GPS co-ordinates as evidence of clearing extent.

8.4.2.2. RAISING FAUNA AWARENESS AMONGST EMPLOYEES

Staff training and site inductions are to communicate the impacts of vehicle strike on native fauna, and potential threatened species likely to occur within the subject land and the wider Gregadoo Solar Farm development.

8.4.2.3. SPEED LIMITS AND POTENTIAL FAUNA SIGNAGE

Appropriate signage will be installed within the subject land across all time frames of the proposal to set speed limits that will be enforced.

8.4.2.4. REHABILITATION OF DISTURBED AREAS

Rehabilitation and restoration of native vegetation and habitat retained but disturbed during construction on or adjacent to the subject land will be undertaken. This will be informed by a Vegetation Management Plan (VMP) following industry best practice and standards. This VMP will inform specific weed management actions that should be undertaken to minimise the further establishment and or spread of present invasive species. Furthermore, a VMP will outline the plant densities and compositions recommended for revegetation and remediation of disturbed areas, aimed at re-establishing locally indigenous Grey Gum Woodland species and their maintenance.

TABLE 23: SUMMARY OF PROPOSED MITIGATION AND MANAGEMENT MEASURES FOR RESIDUAL IMPACTS

Mitigation measure	Method/technique	Timing	Frequency	Responsibility	Efficacy
Construction Environmental Management Plan	A CEMP will be prepared prior to issue of the Construction Certificate. The CEMP will include, at a minimum, industry-standard measures as well as site-specific measures to be followed during subdivision works and subsequent development.	Prior to construction	Once	Proponent and Contractor	Ensures standard and site-specific construction environmental controls are documented.
Delineation of Clearing Areas and exclusion zones for vegetation beyond direct impact footprint.	The construction footprint and exclusion zones (Figure) will be clearly demarcated with temporary fencing and signed, where appropriate, to ensure no vegetation beyond the boundaries will be inadvertently impacted during the construction process.	Construction	Once	Contractor	Prevents unnecessary removal or damage to the TEC or other vegetation or threatened species habitats.
Erosion, sedimentation, and pollution control	Prior to construction Erosion and Sediment Plan will be in place, including best practices and site-specific CEMP. Implementation of control measures in accordance with 'The Blue Book'.	Prior to and during construction	Once	Contractor	Risk of sedimentation, erosion and pollution of adjacent land reduced.
Weed and pathogen management	Early development of CEMP with strategies in place for suitable weed management. Prior to pre-clearing weed species to be identified and removed (including appropriate disposal) or otherwise treated. Hygiene controls such as precautionary cleaning and inspection of plant, machinery, and clothing to prevent transfer of soil, vegetative or other organic material to or within the subject land.	Prior to and during construction	Once	Contractor and ecologist	Risk of introducing or spreading of invasive weed species reduced.
Pre-clearing inspection	Prior to any habitat clearing a pre-clearing survey is to be undertaken by a qualified ecologist identifying fauna habitat. A follow up report is to be prepared with recommendations on how the clearing process should be undertaken.	Prior to construction	Once	Ecologist	Reduces risk of fauna injury or mortality while ensuring best relocation practice.
Speed limits	Appropriate signage to be installed within the subject land across all time frames of the proposal to set speed limits that will be enforced.	All time frames of the proposal	Once for construction and once for operation	Contractor and proponent	Reduced risk of vehicle strike on native fauna.
Rehabilitation of disturbed areas and vegetation management plan.	Restoration of native vegetation and habitat disturbed during construction on or adjacent to the subject land. Incorporation of local endemic flora species into any landscaping and planting plans.	Post construction	Once	Contractor	Reduction in extent of edge effects.
Post-clearing assessment	Post-clearing inspection to be undertaken by a qualified ecologist to verify actual clearing footprint.	Post construction	Once	Proponent	Informs the accuracy of the proposal's credit obligation.
Education of Gregadoo Solar Farm employees	Staff training and induction to include information about threatened species within the subject land and wider Gregadoo Solar Farm development as well as the impacts of vehicle strike on native fauna.	Post construction	Ongoing	Proponent	Reduced risk of vehicle strike on native fauna. Prevents unnecessary disturbance or damage to the TEC or threatened species habitats.

TABLE 24: SUMMARY OF PROPOSED MITIGATION AND MANAGEMENT MEASURES FOR RESIDUAL IMPACTS

Measure/action	Monitoring and evaluation strategy	Performance criteria (linked to monitoring and evaluation strategy)	Adaptive management threshold (trigger for adaptive management plan/actions)	Adaptive management response (when triggered)
Construction Environmental Management Plan	Preparation and review before issue of Construction Certificate	Industry standard and site-specific environmental controls identified.	Industry standard and site-specific environmental controls not clearly identified.	Review and update CEMP.
Delineation of Clearing Areas and exclusion zones for vegetation beyond direct impact footprint.	Inspections of fencing and other markings.	All retained vegetation beyond the construction footprint is protected.	Demarcated areas have been disturbed. Clearing occurs beyond development footprint.	Record extent of impact and report incident. Additional marking or fencing. Include area for remediation/rehabilitation.
Erosion, sedimentation, and pollution control	Inspections of erosion and sediment control measures.	No damage to erosion and sediment control structures. No significant erosion or sedimentation of adjacent land.	Damage detected to erosion and sediment control structures. Significant erosion and sedimentation detected.	Stabilise exposed areas. Repair erosion. Repair erosion and sediment control structures.
Weed and pathogen management	Weed mapping and post treatment inspections.	Location of all priority weed infestations marked and mapped.	Priority weeds not mapped. Priority weeds not eradicated. Introduction of new weeds to the site.	Additional surveys to map all priority weed locations. Undertake follow-up weed control.
Rehabilitation of disturbed areas and vegetation management plan.	Inspection and monitoring of success.	Priority weeds eradicated.	Non-specified (non-local) species planted. Planted species not surviving. Invasive landscape plants spread into adjacent bushland areas.	Removal of non-specified species. Additional planting. Review of planting methods and/or species.

8.5. Adaptive management strategy for uncertain impacts

Adaptive management can be used to address impacts that are infrequent or difficult to measure. These include indirect or prescribed impacts, or other remaining biodiversity impacts.

8.5.1. MANAGING IMPACTS TO SPECIES ASSUMED PRESENT OR UNEXPECTED THREATENED SPECIES FINDS

This BDAR has assumed presence of threatened species on the basis that time constraints have been imposed and targeted surveys have not been undertaken for the following species:

- Fauna:
 - Gang-gang Cockatoo (Breeding) (*Callocephalon fimbriatum*)
 - South-eastern Glossy Black Cockatoo (Breeding) (*Calyptorhynchus lathami lathami*)
 - Key's Matchstick Grasshopper (*Keyacris scurra*)
 - Pink Cockatoo (Breeding) (*Lophochroa leadbeateri*)
 - Barking Owl (*Ninox connivens*)
 - Squirrel Glider (*Petaurus norfolcensis*)
 - Brush-tailed Phascogale (*Phascogale tapoatafa*)
 - Koala (*Phascolarctos cinereus*)
 - Superb Parrot (Breeding) (*Polytelis swainsonii*)
 - Golden Sun Moth (*Synemon plana*)
 - Masked Owl (*Tyto novaehollandiae*)
- Flora:
 - A Spear-grass (*Austrostipa wakoolica*)
 - Small Scurf-pea (*Cullen parvum*)
 - *Euphrasia arguta*

The actual presence and extent of these species are uncertain and consequently, the final impacts are difficult to measure. For threatened fauna species listed above the risk is relatively low due to limited impacts to any specialist habitat, and an unexpected threatened species finds procedure is suitable.

However, for threatened flora, following approval and prior to construction, targeted surveys are to be undertaken to determine presence and if present, determine the extent (e.g., abundance, location for plants) of threatened species within the subject land (see **Table 13** for optimal survey periods). Presence or absence will inform adaptive management strategies which are to consist of actions taken to reduce or eliminate the impact where practicable such as:

- review of proposed minimisation and mitigation measures to appropriately accommodate and avoid serious impacts and harm to threatened species,
- plans to translocate or relocate identified threatened species (under appropriate licences and approvals), and timing works to avoid critical life cycle events such as breeding or nursing.

8.5.2. UNEXPECTED THREATENED SPECIES FINDS (GENERAL)

In the event that a threatened species, or active breeding habitat of a threatened species is unexpectedly discovered during construction, implementation of the following unexpected finds procedure is to be followed:

- cessation of work,

- notification made to person with environmental oversight of the project, potentially the Site Contractor or Environmental Officer,
- consultation with appropriate members of NSW DCCEEW and Commonwealth DCCEEW as required,
- determination of appropriate mitigation measures, relevant relocation measures,
- consideration of potential for reassessment of the proposal and review location or design,
- recommencement of works only once advice and necessary approvals are obtained, and
- inclusion of threatened species in future inductions and management plans.

9. Serious and irreversible impacts

9.1. Assessment for serious and irreversible impacts on biodiversity values

9.1.1. ADDITIONAL IMPACT ASSESSMENT PROVISIONS FOR ENTITIES AT RISK OF AN SAI

9.1.1.1. ADDITIONAL IMPACT ASSESSMENT PROVISIONS FOR THREATENED SPECIES AT RISK OF AN SAI

Euphrasia arguta

Euphrasia arguta is listed as a SAI entity due to the following principle:

- Principle 3: species or ecological communities with currently observed, estimated, inferred or reasonably suspected to have a very limited geographic distribution.

Targeted surveys have been completed across Vegetation Zones 1 and 2 of the subject land, however, Vegetation Zones 3, 4 and 5 have yet to be surveyed for this species. While the presence of this species within these zones is considered unlikely given the extent of modification of these zones, its presence cannot be entirely discounted without the completion of targeted surveys.

1. ACTIONS TO AVOID AND MINIMISE DIRECT AND INDIRECT IMPACTS

The direct and indirect impacts on *Euphrasia arguta* are not yet completely understood within the subject land. While targeted surveys have been completed across Vegetation Zones 1 and 2 of the subject land, Vegetation Zones 3, 4 and 5 have yet to be surveyed for this species. The species was not identified through the current targeted surveys, and as such, no direct or indirect impacts are considered likely for this species within Vegetation Zones 1 and 2. In order to avoid and minimise impacts to *Euphrasia arguta* across the remaining unsurveyed vegetation zones (3, 4 and 5) targeted surveys should be conducted.

While the presence of this species within these zones is considered unlikely given the extent of modification of these zones, its presence cannot be discounted without the completion of targeted surveys. If *Euphrasia arguta* is found to occur in the unsurveyed zones, direct impacts will be further mitigated through design refinement of the proposal. Indirect impacts will be managed through mitigation measures which are outlined in **Sections 7 and 8**.

2. CURRENT STATUS (EXCLUDING IMPACTS OF THE PROPOSAL)

a. *evidence of rapid decline (Principle 1, clause 6.7(2)(a) BC Regulation) presented by an estimate of the:*

i. decline in population of the species in NSW in the past 10 years or three generations (whichever is longer), or

ii. decline in population of the species in NSW in the past 10 years or three generations (whichever is longer) as indicated by: an index of abundance appropriate to the species; decline in geographic distribution and/or habitat quality; exploitation; effect of introduced species, hybridisation, pathogens, pollutants, competitors or parasites

Not applicable.

b. *evidence of small population size (Principle 2, clause 6.7(2)(b) BC Regulation) presented by:*

i. an estimate of the species' current population size in NSW, and

ii. an estimate of the decline in the species' population size in NSW in three years or one generation (whichever is longer), and

iii. where such data is available, an estimate of the number of mature individuals in each subpopulation, or the percentage of mature individuals in each subpopulation, or whether the species is likely to undergo extreme fluctuations

Not applicable.

c. evidence of limited geographic range for the threatened species (Principle 3, clause 6.7(2)(c) BC Regulation) presented by:

i. extent of occurrence

The extent of occurrence of *Euphrasia arguta* is estimated to be 26 km² with the species known from only three locations in two areas approximately 14 km apart (Commonwealth DCCEEW, 2011).

ii. area of occupancy

Euphrasia arguta is estimated to have an area of occupancy of 0.03 km². The species is currently listed as occurring at the border of the New England Tableland and the North Coast Bioregions (Commonwealth DCCEEW, 2011). The species is known from Nundle State Forest southeast of Tamworth and adjacent private land, with further records also being made from the Paterson and Willams Rivers in the Hunter Valley, and also Mudgee and the plains near Bathurst (Commonwealth DCCEEW, 2011). Prior to this, the species was not sighted since 1904 and was previously known from Sydney to Bathurst and north to Walcha, NSW.

iii. number of threat-defined locations (geographically or ecologically distinct areas in which a single threatening event may rapidly affect all species occurrences), and

As mentioned above, the current area of occupancy of *Euphrasia arguta* is primarily situated within Nundle State Forest and on adjacent surrounding private land. It has a very restricted distribution, and this distribution is considered to be fragmented (Commonwealth DCCEEW, 2011). The largest population which contains more than 90% of known individuals occurs mostly in a strip of 15 m wide which was cleared for a firebreak in January 2007. Vegetation within this strip was bulldozed, with vegetation then left to regenerate. The occurrence of this population in a cleared area, coupled with the fact that the species is an annual plant, suggests that it may respond positively to disturbance. However, there is no available data to evaluate the disturbance regimes most conducive to germination. Approximately 60% of the site was then cleared again in December 2009 when plants had germinated but not yet developed to the flowering stage. As of May 2010, regeneration of *Euphrasia arguta* at this site has not been recorded, and thus, the species is likely to have undergone a decline in numbers as a result of repeated clearing (Commonwealth DCCEEW, 2011).

This information suggests that the largest population of *Euphrasia arguta* is highly vulnerable to improper management activities such as the clearing events listed above. This suggests that the species is at risk of further decline if similar threatening actions continue without proper research suggesting otherwise. As such, there is potential that due to the fragmented nature of populations at sites, threatening actions such as clearing may rapidly affect the species occurrence at these sites

iv. whether the species' population is likely to undergo extreme fluctuations

As *Euphrasia arguta* is an annual plant, population numbers may fluctuate substantially from year to year and site to site. This coupled with the species not well understood response to disturbance activities and continued threat of roadside maintenance and of roadside vegetation clearing for firebreaks at its known locations is precarious to the survival of the species (Commonwealth DCCEEW, 2011). As such, extreme fluctuations in populations may occur given habitat management activities such as clearing as well as the revegetation of native vegetation within these sites possibly reducing the species area of occupancy.

d. evidence that the species is unlikely to respond to management (Principle 4, clause 6.7(2)(d) BC Regulation) because:

i. known reproductive characteristics severely limit the ability to increase the existing population on, or occupy new habitat (e.g. species is clonal) on, a biodiversity stewardship site

ii. the species is reliant on abiotic habitats which cannot be restored or replaced (e.g. karst systems) on a biodiversity stewardship site, or

iii. *life history traits and/or ecology is known but the ability to control key threatening processes at a biodiversity stewardship site is currently negligible (e.g. frogs severely impacted by chytrid fungus).*

Not applicable.

3. WHERE THE TBDC INDICATES DATA IS ‘UNKNOWN’ OR ‘DATA DEFICIENT’ FOR A SPECIES FOR A CRITERION LISTED IN SUBSECTION 9.1.2(2.), THE ASSESSOR MUST RECORD THIS IN THE BDAR OR BCAR.

Information on the current status of *Euphrasia arguta* is limited and data deficient within the TBDC. At the time of assessment Principles 1, 2 and 4 are data deficient within the TBDC. Only Principle 3 lists information, this being it is known from ≤ 3 locations and/or an area of occupancy of $< 10 \text{ km}^2$ or extent of occurrence $< 100 \text{ km}^2$.

4. IN RELATION TO THE IMPACTS FROM THE PROPOSAL ON THE SPECIES AT RISK OF AN SAI, THE ASSESSOR MUST INCLUDE DATA AND INFORMATION ON:

a. *the impact on the species’ population (Principles 1 and 2) presented by:*

- i. *an estimate of the number of individuals (mature and immature) present in the subpopulation on the subject land (the site may intersect or encompass the subpopulation) and as a percentage of the total NSW population, and***
- ii. *an estimate of the number of individuals (mature and immature) to be impacted by the proposal and as a percentage of the total NSW population, or***
- iii. *if the species’ unit of measure is area, provide data on the number of individuals on the site, and the estimated number that will be impacted, along with the area of habitat to be impacted by the proposal***

Not applicable. Targeted surveys would be required to accurately address these criteria.

b. *impact on geographic range (Principles 1 and 3) presented by:*

- i. *the area of the species’ geographic range to be impacted by the proposal in hectares, and a percentage of the total AOO, or EOO within NSW***

The proposal will involve the modification and clearing of 0.53 ha of modified grassland and planted native overstorey vegetation. Targeted surveys have been conducted across Vegetation Zones 1 and 2 which encompasses 3.27 ha of the subject land with no individuals being identified as present within these zones.

Further surveys are required across Vegetation Zones 3, 4 and 5 as to ascertain the presence of *Euphrasia arguta* within these zones. If the species is found to occur within these zones, there will be a reduction in species occupancy is considered to be 0.0269 ha from direct and indirect impacts before the consideration of refinement and possible relocation of the proposal. Under the assumption that targeted surveys will be completed, and the species is not recorded in the subject land, the proposal is unlikely to impact the geographic range of *Euphrasia arguta* within NSW.

- ii. *the impact on the subpopulation as either: all individuals will be impacted (subpopulation eliminated); OR impact will affect some individuals and habitat; OR impact will affect some habitat, but no individuals of the species will be directly impacted***

Targeted surveys are yet to have been undertaken across the entirety of the subject land for *Euphrasia arguta*. Until these have been completed and the presence or absence of this species has been determined it is not yet clear whether the proposal will impact a subpopulation of this species. As currently presented, these unsurveyed Vegetation Zones 3, 4 and 5 are not considered to be likely habitat for the species given their extent of modification and lack of records within the surrounding landscape. Therefore, it is unlikely the proposal will impact this species; however, targeted surveys are required to confidently reinforce this assumption

iii. *to determine if the persisting subpopulation that is fragmented will remain viable, estimate (based on published and unpublished sources such as scientific publications, technical reports, databases or documented field observations) the habitat area required to support the remaining population, and habitat available within dispersal distance, and distance over which genetic exchange can occur (e.g. seed dispersal) and pollination distance for the species*

As mentioned above, it is currently unclear whether *Euphrasia arguta* is present within the currently unsurveyed vegetation zones. Therefore, it is currently unclear whether the proposal will lead to the fragmentation of a subpopulation such that it becomes unviable or there is a reduction or loss in genetic viability. Limited scientific research has been conducted on this species and little is known about the distance of species dispersal and distance over which genetic exchange can occur. Targeted surveys are required to ascertain the presence of this species and thus determine the potential impact of this proposal on the functioning and viability of any possibly present subpopulation.

iv. *to determine changes in threats affecting remaining subpopulations and habitat if the proposed impact proceeds, estimate changes in environmental factors including changes to fire regimes (frequency, severity); hydrology, pollutants; species interactions (increased competition and effects on pollinators or dispersal); fragmentation, increased edge effects, likelihood of disturbance; and disease, pathogens and parasites. Where these factors have been considered elsewhere in relation to the target species, the assessor may refer to the relevant sections of the BDAR or BCAR.*

As mentioned, it is currently unknown whether the proposal will lead to an impact on this species. Given the proposals relatively small scale and the lack of supporting species records within the surrounding landscape to suggest its presence, it is currently unclear whether changes in land use will affect this species. If this species is found to occur within Vegetation Zones 3, 4 and 5 it is strongly suggested that the proposal be redesigned as to avoid impacts to this species. The proposal may lead to minor changes in the subject land's hydrology, pollution, edge effects and other impacts. However, until this species has been fully surveyed for across the subject land it is unclear whether the proposal will have an impact, either direct or indirect on *Euphrasia arguta*.

Further information into the assessment of the proposal on this species can be found in **Appendix E**.

5. THE ASSESSOR MAY ALSO PROVIDE NEW INFORMATION THAT CAN BE USED TO DEMONSTRATE THAT THE PRINCIPLE IDENTIFYING THE SPECIES AS AT RISK OF AN SAI, IS INACCURATE.

It is believed that given the current research and available information sources, *Euphrasia arguta* qualifies as SAI given its limited range, fluctuating population size and risk of further reduction in population size.

SUMMARY

As presented, it is unclear whether the proposal will impact the SAI *Euphrasia arguta*. As stated above, targeted surveys across Vegetation Zones 3, 4 and 5 are required to determine whether the proposal will have either a direct or indirect impact on this species. Following targeted surveys if this species is found to occur within these vegetation zones, refinement and relocation of impact areas of the proposal will be required to avoid a chance of any serious and irreversible impact to this species.

9.1.1.2. ADDITIONAL IMPACT ASSESSMENT PROVISIONS FOR TECs AT RISK OF AN SAI

Box Gum Woodland CEEC

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 (Box Gum Woodland CEEC) has been identified across 0.11 ha of the subject land.

Box Gum Woodland CEEC has been listed as a possible SAI due to the following Principles:

- Principle 1: species or ecological community currently in a rapid rate of decline.
- Principle 2: species or ecological communities with a very small population size.

Additional impact assessment provisions for Principles 1 and 2 are presented below in accordance with section 9.1.1 of the BAM. Principle 3 (species or area of ecological community with very limited geographic distribution) is not applicable to Box Gum Woodland CEEC as the extent of occurrence, area of occupancy and number of threat-defined locations is unknown in the TBDC. The TBDC does not present information related to Principle 4 (evidence that the TEC is unlikely to respond to management), however Box Gum Woodland CEEC is known to respond to management, where appropriately implemented, as documented through *A guide to managing Box Gum Grassy Woodlands* (Rawlings *et al.*, 2010).

The information provided below is summarised and sourced from:

- National Recovery Plan White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland (NSW DCCEEW, 2011),
- Commonwealth Listing Advice on White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Commonwealth TSSC, 2006), and
- NSW Threatened Species Scientific Committee (NSW TSSC) Notice of and reason for the Final Determination to list 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 as a critically endangered ecological community (NSW TSSC, 2020)
- NSW TSSCC Conservation Assessment of White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Mark, Tozer. and Christopher, S., 2020)
- NSW TSSCC (2002) Preliminary Determination to support a proposal to list White Box Yellow Box Blakely's Red Gum Woodland as an Endangered Ecological Community on Part 3 of Schedule 1 of the Act.

1. ACTIONS TO AVOID AND MINIMISE DIRECT AND INDIRECT IMPACTS

The proposal has been cited as to only impact 0.0268 ha of this CEEC. Furthermore, the proposed modification has been designed to ensure that the approved overhead and underground transmission line can be constructed and maintained without adverse impacts to Boiling Down Creek or the adjoining riparian corridor which is surrounded by this CEEC.

While the proposal involves the removal of up to four planted eucalypts (between the DBH of ~10-30) these are not considered to form part of this CEEC due to them not being part of the dominant or sub-dominant characteristic overstory species. It will, however, involve the removal of a small portion of understory associated species including some native grasses and forbs. This portion of the subject land does not contain the regeneration of characteristic overstory species that occur in the surrounding area, particularly surrounding Boiling Down Creek to the east of Vegetation Zone 4 and adjacent to the west of Vegetation Zone 5. Furthermore, actions to avoid and minimise direct and indirect impacts are outlined in **Sections 7** and **8**.

2. CURRENT STATUS (EXCLUDING IMPACTS OF THE PROPOSAL)

a. evidence of reduction in geographic distribution (Principle 1, clause 6.7(2)(a) BC Regulation) as the current total geographic extent of the TEC in NSW AND the estimated reduction in geographic extent of the TEC since 1970 (not including impacts of the proposal)

i extent of reduction in ecological function for the TEC using evidence that describes the degree of environmental degradation or disruption to biotic processes (Principle 2, clause 6.7(2)(b) BC Regulation) indicated by:

ii change in community structure

iii change in species composition

iv disruption of ecological processes

v invasion and establishment of exotic species

vi degradation of habitat, and

vii fragmentation of habitat.

Box-Gum Grassy Woodland is geographically widespread, but now a highly fragmented ecological community. This ecological community has been heavily cleared across most of its range. The remaining extent of the ecological community is highly fragmented, occurring in small, isolated patches within a cleared environment, or within a landscape of other disturbed woodlands. The very large historical decline in geographic distribution is corroborated by a variety of sources although there is some uncertainty surrounding the current extent of the community and its pre-1750 distribution.

It has been notably documented by all sources, the difficulties to ascertain the current area of the ecological community. Nevertheless, the TSSC states that available data shows over 90% of the original extent of this ecological community has been cleared. Of the remaining area, a large proportion of it has been modified and occurs as trees over a predominantly exotic understory. The TSSC judge that less than 5% of the original extent of the ecological remains of sufficient condition and size to be included in the listed ecological community, having undergone a decline of 95% or more.

The CEEC is subject to a number of threats that increase degradation and fragmentation of habitat over time, leading to ongoing declines in geographic distribution and disruption of biotic processes or interactions. Threats identified for this CEEC include but are not limited to:

- combined grazing pressure from introduced herbivores (e.g., European Rabbit (*Oryctolagus cuniculus*)), native herbivores and domestic stock,
- weed invasion by an extensive range of exotic plant species,
- altered fire regimes,
- dryland salinity which arises as a consequence of elevated water tables, and
- clearing and degradation of remnants for agriculture, forestry, and development.

Weed invasion is and continues to be one of the key mechanisms and indicators of degradation of the CEEC. Direct threats such as grazing, soil disturbance and nutrient enrichment facilitate weed invasion. Elevated nitrogen has been associated with the invasion of weeds and eventual conversion from native to exotic pasture (Prober & Thiele, 2004a, 2004b). Overall, remnants of the CEEC are subject to invasion by an extensive range of naturalised plant species with major weeds listed in the final determination report, including:

- woody species: European Olive (*Olea europaea*), African Olive (*Olea europaea* subsp. *cuspidata*), English Hawthorn (*Crataegus monogyna*), Sweet Briar (*Rosa rubiginosa*), Scotch Broom (*Cytisus scoparius*), African Boxthorn (*Lycium ferocissimum*), Radiata Pine (*Pinus radiata*), Blackberry (*Rubus fruticosus* sp. agg.) and Privet (*Ligustrum* spp.),

- annual grasses: Wild Oat (*Avena* spp.), Brome Grass (*Bromus* spp.), Ryegrass (*Lolium* spp.), Veldt Grass (*Ehrharta* spp.) and Fescue (*Vulpia* spp.),
- perennial grass species including Coolatai Grass (*Hyparrhenia hirta*), Chilean Needlegrass (*Nassella neesiana*), African Lovegrass and Serrated Tussock (*N. trichotoma*); and Phalaris (*Phalaris aquatica*), a widely used pasture grass and an aggressive invader of grassy ecosystems,
- perennial herbs: For example, St John's Wort (*Hypericum perforatum*) and Wild Sage (*Salvia verbenaca*), and
- annual and biennial herbs: For example, Clovers and Medics (*Trifolium* and *Medicago* spp.), Capeweed (*Arctotheca calendula*), Thistles (e.g. *Cirsium vulgare*, *Carthamus lanatus*) and Paterson's Curse (*Echium plantagineum*), which occur to varying degrees in most remnants.

The invasion of native plant communities by exotic perennial grasses has been listed as a Key Threatening Process under the BC Act.

3. WHERE THE TBDC INDICATES DATA IS 'UNKNOWN' OR 'DATA DEFICIENT' FOR A TEC FOR A CRITERION LISTED IN SUBSECTION 9.1.1(2.) OF THE BAM

Information on the current status of the CEEC is limited and data deficient within the TBDC.

4. IN RELATION TO THE IMPACTS FROM THE PROPOSAL ON THE TEC AT RISK OF AN SAI

a. the impact on the geographic extent of the TEC (Principles 1 and 3) by estimating the total area of the TEC to be impacted by the proposal:

i in hectares, and

The total area of the Box Gum Woodland to be directly impacted by the proposal is 0.0268 ha.

ii as a percentage of the current geographic extent of the TEC in NSW.

The exact current total geographic extent of Box Gum Woodland CEEC in NSW is unknown due to data deficiency. The final determination (NSW TSSC, 2020) states that clearing of the Box Gum Woodland CEEC is likely to continue at least in the short term in NSW under the current regulatory framework. Accordingly, it is not suitable to present the impacted area as a percentage of the current geographic extent of the TEC in NSW as the current extent is largely unknown.

b. the extent that the proposed impacts are likely to contribute to further environmental degradation or the disruption of biotic processes (Principle 2) of the TEC by:

i estimating the size of any remaining, but now isolated, areas of the TEC; including areas of the TEC within 500 m of the development footprint or equivalent area for other types of proposals

ii describing the impacts on connectivity and fragmentation of the remaining areas of TEC measured by:

- distance between isolated areas of the TEC, presented as the average distance if the remnant is retained AND the average distance if the remnant is removed as proposed, and
- estimated maximum dispersal distance for native flora species characteristic of the TEC, and
- other information relevant to describing the impact on connectivity and fragmentation, such as the area to perimeter ratio for remaining areas of the TEC as a result of the development

Field surveys undertaken to date have focussed on the subject land and have included the assessment of remnant woodland and areas of the CEEC which occur as derived (modified) secondary grassland. As the CEEC can occur both as grassy woodland and as derived grassland, further assessment focussing on adjacent land would be required to accurately estimate the extent of the CEEC within 500 m of the development site.

As it was not possible to access the surrounding properties for assessment, estimates of remnants are used for the purposes of describing the impact on connectivity and fragmentation. Aerial imagery and the

NSW SVTM has been reviewed and ‘remnants’ of the CEEC within 500 m of the development site have been defined as connected woody areas (containing trees) mapped as PCT 277 and 267 likely to be present as CEEC. Given the distance between areas of the subject land and inconsistencies with STVM and the presence of PCTs within the surrounding landscape, it is difficult and impractical to define the area of occupancy of this CEEC within the surrounding landscape as well as a possible percentage cover of this CEEC. However, the CEEC appears to be highly fragmented within the surrounding landscape as indicated by the NSW STVM and aerial imagery. Connectivity between patches is largely limited, although does occur but through planted native and exotic overstory vegetation and through PCT no associated with the CEEC. Despite this, the CEEC occurs within a landscape that has been largely cleared and modified such that it no longer represents this CEEC across the majority of its extent. It is likely that the CEEC within the subject land is of lower quality, being that it occurs as a derived and mostly modified grassland (Vegetation Zone 5) and planted non-associated overstory species with some remnant CEEC aligned species within its understory (Vegetation Zone 4). Remaining areas of this CEEC within the surrounding landscape of the subject land are likely of greater condition as apparent through aerial imagery displaying denser woodland and less pressure from residential development.

Following development, fragmentation of the patch of the CEEC within the subject land will be limited, as it only requires the removal of 0.027 ha of mostly derived and modified native grassland, as well as up to four semi-mature non-community associated overstory trees. Impacts to connectivity within the subject land of this CEEC as mentioned will be minor and not considered to significantly impact connectivity or the potential regeneration of this community.

Maximum dispersal for native flora species characteristic of the CEEC is difficult to determine. The main dispersal mechanisms for flora species associated with the CEEC include animals, wind, water runoff, and gravity, all of which would be impacted or otherwise modified by the proposal. Animals are fundamental to the overall functioning of grassy woodland ecosystems and removal of suboptimal fauna habitat will likely only lead to a very minor reduction in pollination and seed dispersal. The proposal has limited its impact through careful citing and avoidance of most tree, and thus, limiting impacts as much as possible to this CEEC and its connectivity within the subject land and surrounding landscape.

iii describing the condition of the TEC according to the vegetation integrity score for the relevant Vegetation Zone(s) (Section 4.3). The assessor must also include the relevant composition, structure, and function condition scores for each Vegetation Zone.

The TEC is consistent with PCT 277 within the subject land. This PCT is present in two Vegetation Zones with associated vegetation integrity scores displayed in **Table 25** and described as follows:

- Zone 4 (very low) – planted woodland (of non CEEC associated species) with some native grasses and low forb diversity, and
- Zone 5 (very low) – mostly exotic grassland.

TABLE 25: VEGETATION INTEGRITY SCORES AND IMPACTED

Vegetation Zone ID	Condition scores			Vegetation integrity	Area impacted
	Composition	Structure	Function		
Zone 4	42.4	33.1	56.9	43.1	0.0068 ha
Zone 5	0.8	0	2.5	0.3	0.02 ha
				Total	0.0268 ha

SUMMARY

The proposal will impact 0.027 ha of the SAII entity, commonly known as Box Gum Woodland and listed as Critically Endangered under the NSW BC 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 CEEC has been listed as SAII entity due to Principle 1 (rapid rate of decline) and Principle 2 (very small population size). Box Gum Woodland is a geographically widespread but now highly fragmented ecological community, occurring in small, isolated patches within a cleared environment, or within a landscape of other disturbed woodlands. The CEEC is under increasing pressure from threatening processes including but not limited to clearing and degradation of remnants for development.

The proposal involves the removal of up to 0.027 ha of the Box Gum Woodland CEEC including up to four planted non-CEEC associated trees. Following development, the local CEEC patch is unlikely to be significantly fragmented given the small area of proposed impact. It is considered unlikely to lead to a lack of habitat connectivity within the subject land and wider surroundings, given its small area of impact and the already highly fragmented characteristic of this CEEC within the surrounding landscape. Furthermore, it is unlikely to reduce the functionality of this CEEC or remove important habitat features that may be utilised by fauna species. Further avoidance and minimisation measures of direct and indirect impacts have been outlined in **Section 7**.

10. Impact summary

10.1. Determine an offset requirement for impacts

10.1.1. IMPACTS ON NATIVE VEGETATION AND TECs OR ECs (ECOSYSTEM CREDITS)

The proponent has avoided impacts to Vegetation Zone 1 during the design phase, and Vegetation Zone 2 is consistent with category 1-exempt land. Impacts also occur within Vegetation Zones 3, 4, and 5, however Vegetation Zone 5 has a Vegetation Integrity Score of below the threshold for ecosystem credit requirement (<15) as seen below in **Table**.

TABLE 26: IMPACTS THAT REQUIRE AN OFFSET - ECOSYSTEM CREDITS

Vegetation Zone	PCT ID	TEC	Impact area	Current VI score	Future VI score	Change in VI score	Biodiversity risk weighting	Number of ecosystem credits required
Zone 1	76	Inland Grey Box Woodland	N/A	41.5	41.5	-41.5	2	0
Zone 2	76		0.5 ha	13.5	13.5	-13.5	2	0
Zone 3	76		0.01 ha	16.6	16.6	-16.6	2	1
Zone 4	277	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland	0.0068 ha	43.1	43.1	-43.1	2.5	1
Zone 5	277		0.02 ha	0.3	0.3	-0.3	2.5	0
Total Credits								2

10.1.2. IMPACTS ON THREATENED SPECIES AND THEIR HABITAT (SPECIES CREDITS)

TABLE 27: IMPACTS THAT REQUIRE AN OFFSET - SPECIES CREDIT

Common name	Scientific name	BC Act status	EPBC Act status	Loss of habitat (ha)	Biodiversity risk weighting	Number of ecosystem credits required
Flora						
A Spear-grass	<i>Austrostipa wakoolica</i>	E	E	0.02	2	3
Small Scurf-pea	<i>Cullen parvum</i>	E	-	0.02	2	3
N/A	<i>Euphrasia arguta</i>	CE	CE	0.02	3	3
Fauna						
Key's Matchstick Grasshopper	<i>Keyacris scurra</i>	E	E	0.02	2	3
Barking Owl	<i>Ninox connivens</i>	V	-	0.02	2	3
Squirrel Glider	<i>Petaurus norfolcensis</i>	V	-	0.01	2	1
Squirrel Glider in the Wagga Wagga Local Government Area	<i>Petaurus norfolcensis – endangered population</i>	E	-	0.01	2	1
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	V	-	0.01	2	1
Koala	<i>Phascolarctos cinereus</i>	E	E	0.01	2	1
Golden Sun Moth	<i>Synemon plana</i>	V	V	0.02	1.5	3
Masked Owl	<i>Tyto novaehollandiae</i>	V	-	0.02	2	3

10.1.3. INDIRECT AND PRESCRIBED IMPACTS

Indirect and prescribed impacts that remain after measures to avoid, minimise, and mitigate have been applied, may be offset using additional biodiversity credits (above the credit requirement generated by the BAM-C for direct impacts) and/or other conservation measures. No additional biodiversity credits are proposed for indirect and prescribed impacts.

10.2. Impacts that do not require an offset

The subject land contains 2.97 ha of land consistent with category 1-exempt land. The development footprint (0.50 ha) is situated wholly within areas consistent with category 1-exempt land and consequently impacts do not require an offset with associated prescribed impacts addressed in **Section 8.3**.

1. Biodiversity credit report

1.1. Ecosystem credits

TABLE 28: ECOSYSTEM CREDIT CLASS AND MATCHING CREDIT PROFILE

Ecosystem credit	Attributes shared with matching credits						
	PCT name	PCT vegetation class	PCT vegetation formation	Associated TEC or EC	Offset trading group	Hollow bearing trees present?	IBRA subregion
Zone 3 1 credit	PCT 76: Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	Floodplain Transition Woodlands	Grassy woodlands	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Penepplain, Nandewar and Brigalow Belt South Bioregions	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Penepplain, Nandewar and Brigalow Belt South Bioregions	No	Inland Slopes, Bogan-Macquarie, Bondo, Capertee Uplands, Capertee Valley, Crookwell, Hill End, Kerrabee, Lower Slopes, Murray Fans, Murrumbateman, Orange, Pilliga, Talbragar Valley and Wollemi. or Any IBRA subregion that is within 100 kilometres of the outer edge of the impacted site.
Zone 4 1 credit	PCT 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	Western Slopes Grassy Woodlands	Grassy woodlands	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	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	No	Inland Slopes, Bogan-Macquarie, Bondo, Capertee Uplands, Capertee Valley, Crookwell, Hill End, Kerrabee, Lower Slopes, Murray Fans, Murrumbateman, Orange, Pilliga, Talbragar Valley and Wollemi. or Any IBRA subregion that is within 100 kilometres of the outer edge of the impacted site.

1.2. Species credits

TABLE 29: SPECIES CREDIT CLASS AND MATCHING CREDIT PROFILE

Species credit	Attributes shared with matching credits				
	Name of threatened species	Kingdom	BC Act status	EPBC Act status	IBRA region
Flora					
3	A Spear-grass	Plantae	Endangered	Endangered	Any in NSW
3	Small Scurf-pea	Plantae	Endangered	Not listed	Any in NSW
3	<i>Euphrasia arguta</i>	Plantae	Critically Endangered	Critically Endangered	Any in NSW
Fauna					
3	Key's Matchstick Grasshopper	Animalia	Endangered	Endangered	Any in NSW
3	Barking Owl	Animalia	Vulnerable	Not listed	Any in NSW
1	Squirrel Glider	Animalia	Vulnerable	Not listed	Any in NSW
1	Squirrel Glider in the Wagga Wagga Local Government Area	Animalia	Endangered	Not listed	Any in NSW
1	Brush-tailed Phascogale	Animalia	Vulnerable	Not listed	Any in NSW
1	Koala	Animalia	Endangered	Endangered	Any in NSW
3	Golden Sun Moth	Animalia	Vulnerable	Vulnerable	Any in NSW
3	Masked Owl	Animalia	Vulnerable	Not listed	Any in NSW

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Figures

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FIGURE 1: SITE MAP

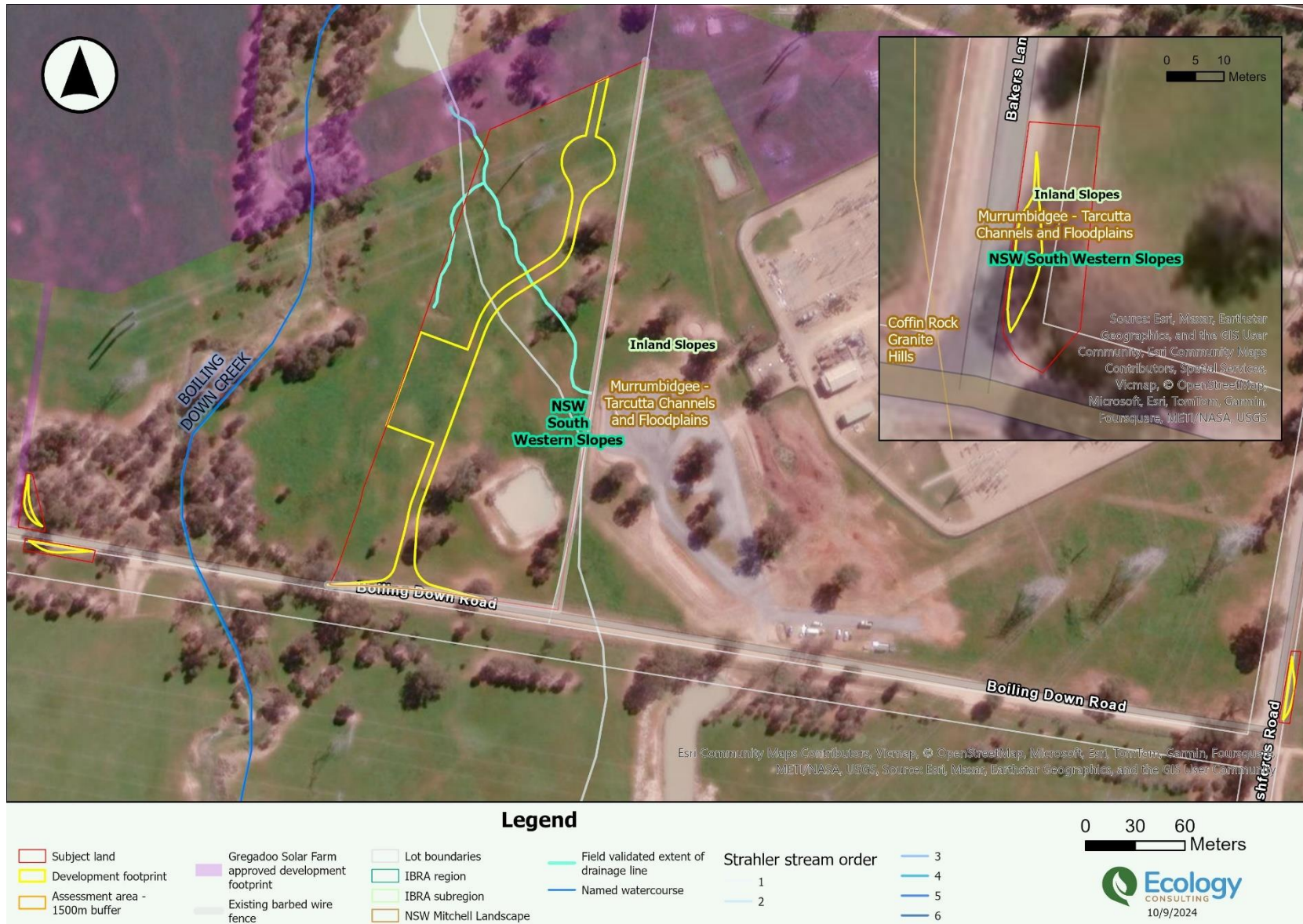
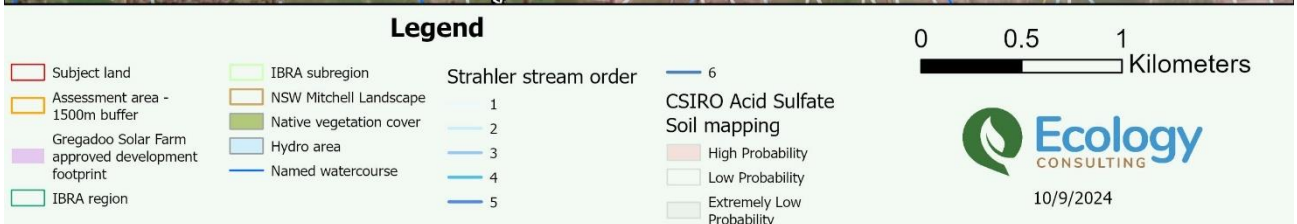
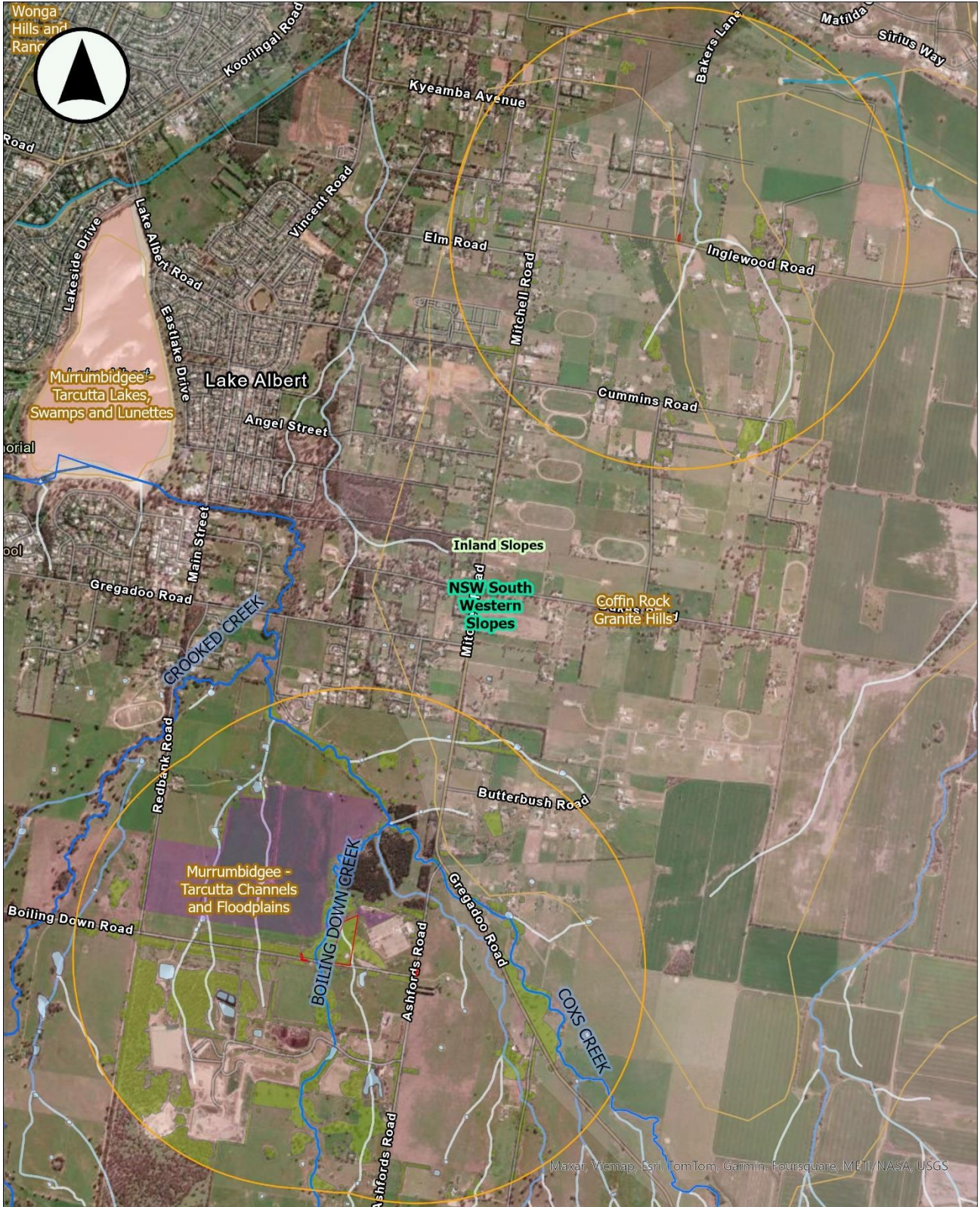


FIGURE 2: LOCATION MAP



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FIGURE 3: NATIVE VEGETATION REGULATORY MAP (DRAFT)

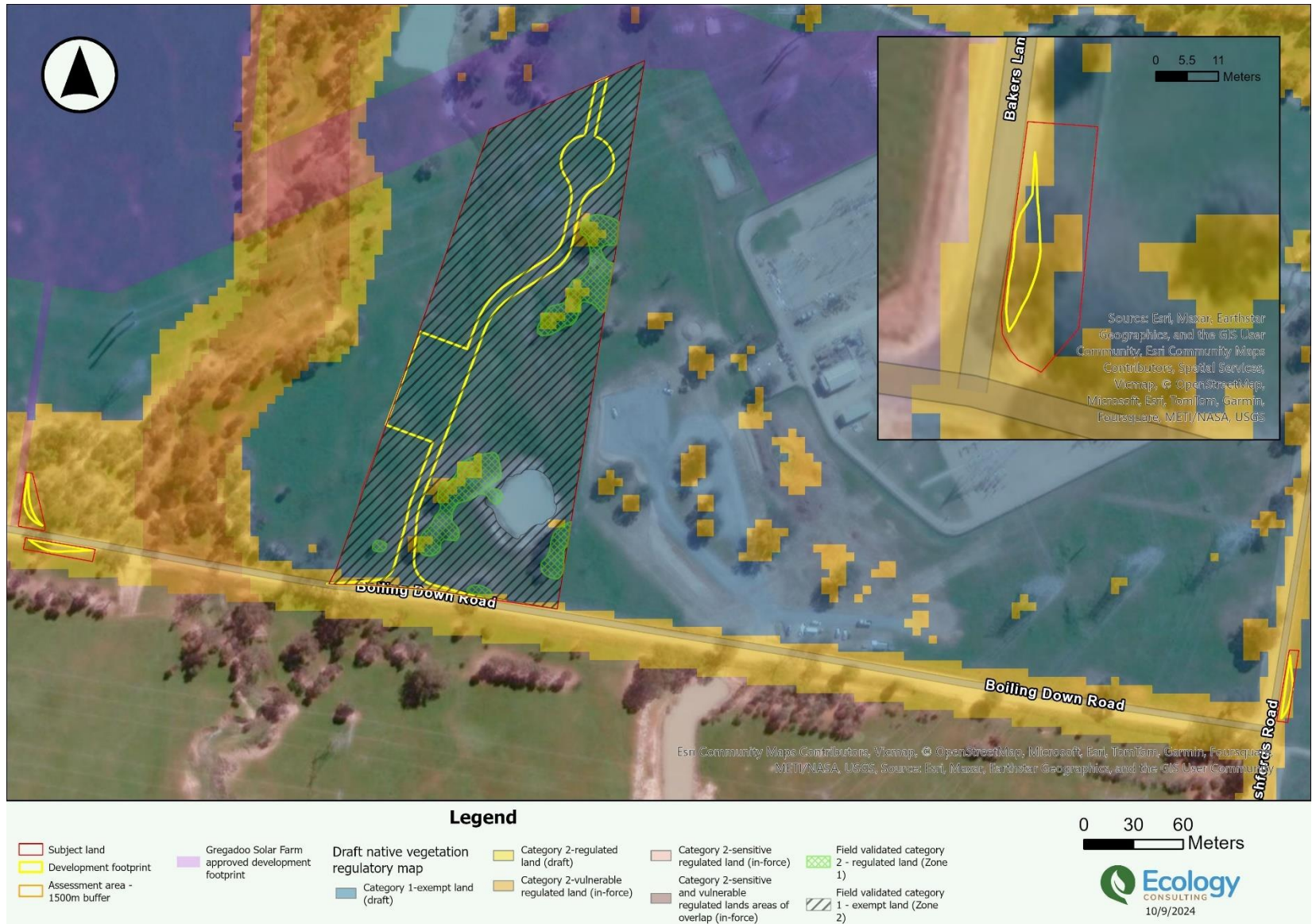


FIGURE 4: DEVELOPMENT PLANS (AS SUPPLIED)

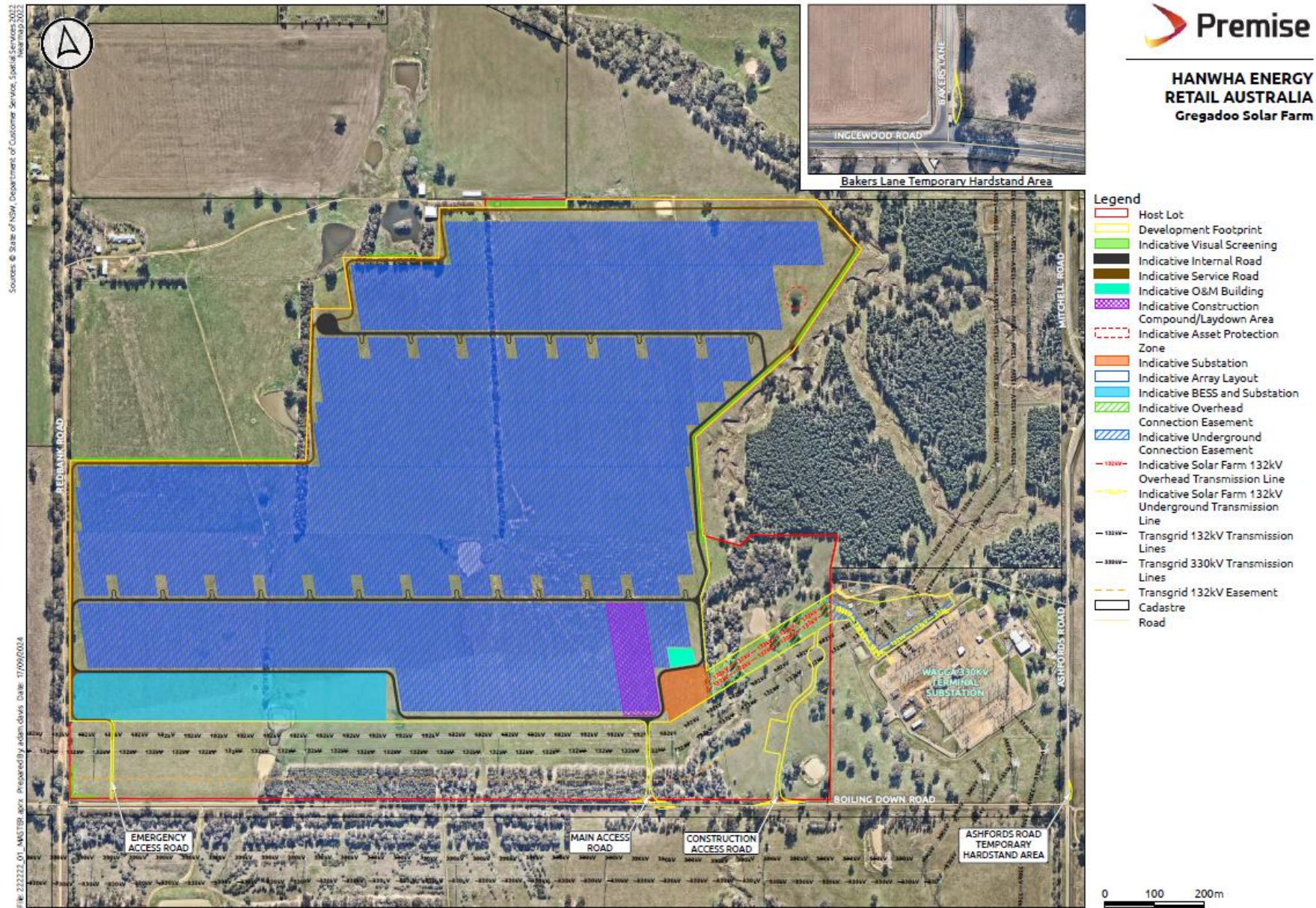


FIGURE 5: DEVELOPMENT FOOTPRINT



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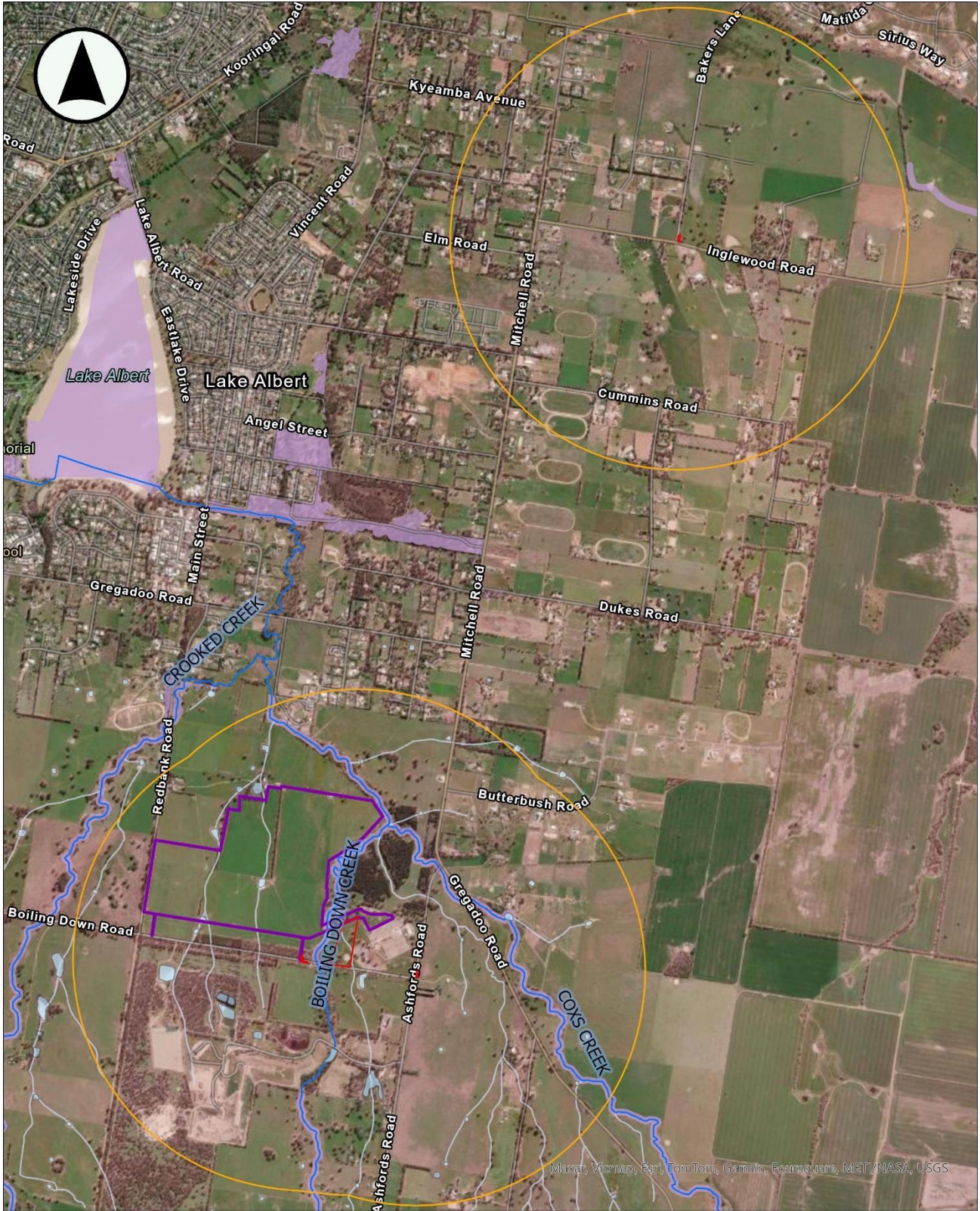
Legend

- Subject land
- Development footprint
- Assessment area - 1500m buffer
- Gregadoo Solar Farm approved development footprint
- Existing barbed wire fence

0 30 60 Meters



FIGURE 6: BIODIVERSITY VALUES MAPPING



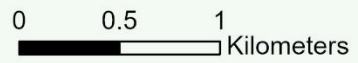
Legend

- Subject land
- Assessment area - 1500m buffer
- Gregadoo Solar Farm approved development footprint

- Named watercourse
- Hydro line
- Hydro area

Biodiversity Values Map

- Biodiversity Values
- Biodiversity Values added in the last 90 days



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FIGURE 7: UNVALIDATED VEGETATION MAPPING - NSW STATE VEGETATION TYPE MAP 2022

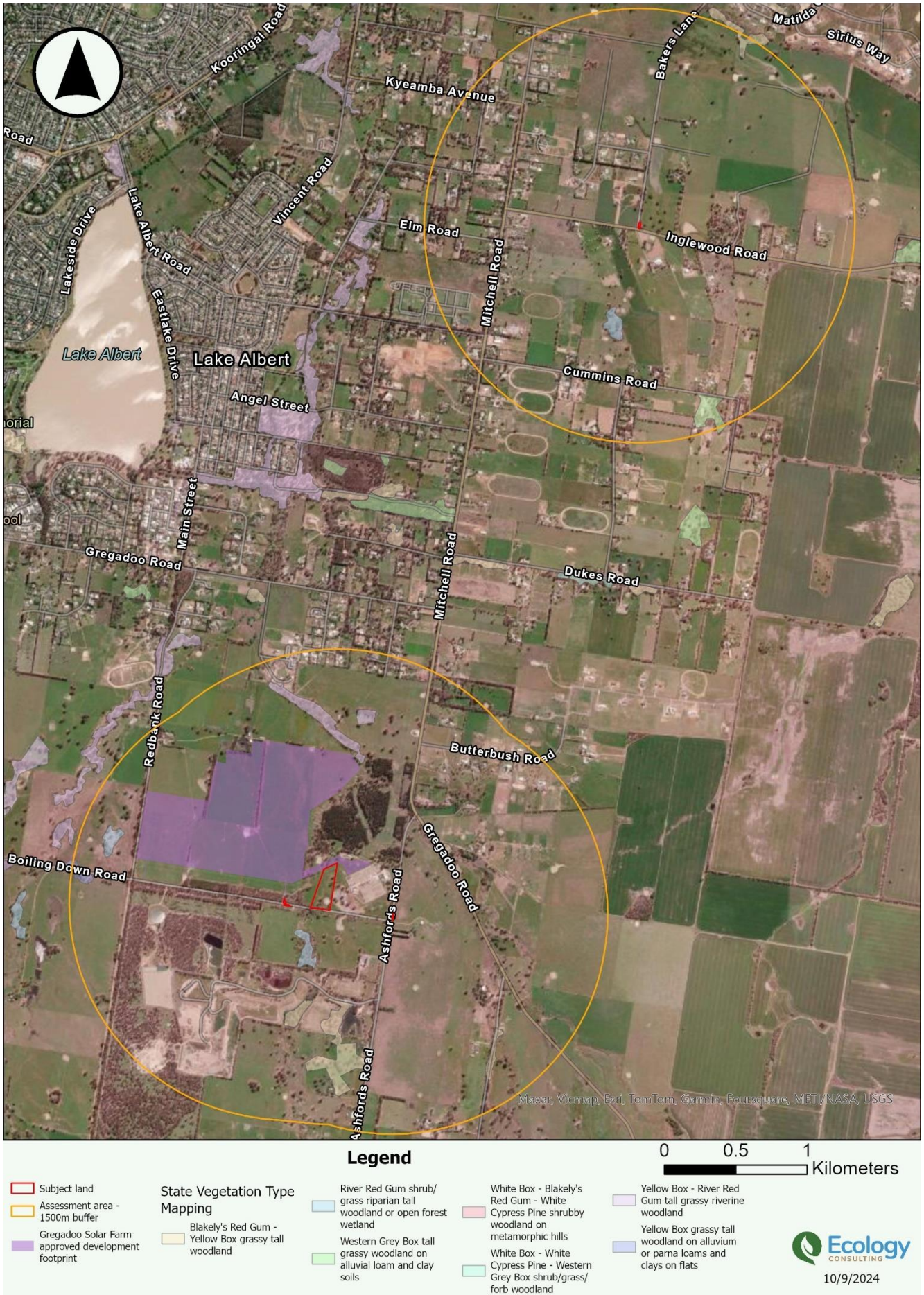


FIGURE 8: FLORA FIELD SURVEY LOCATIONS



FIGURE 9: NATIVE VEGETATION EXTENT

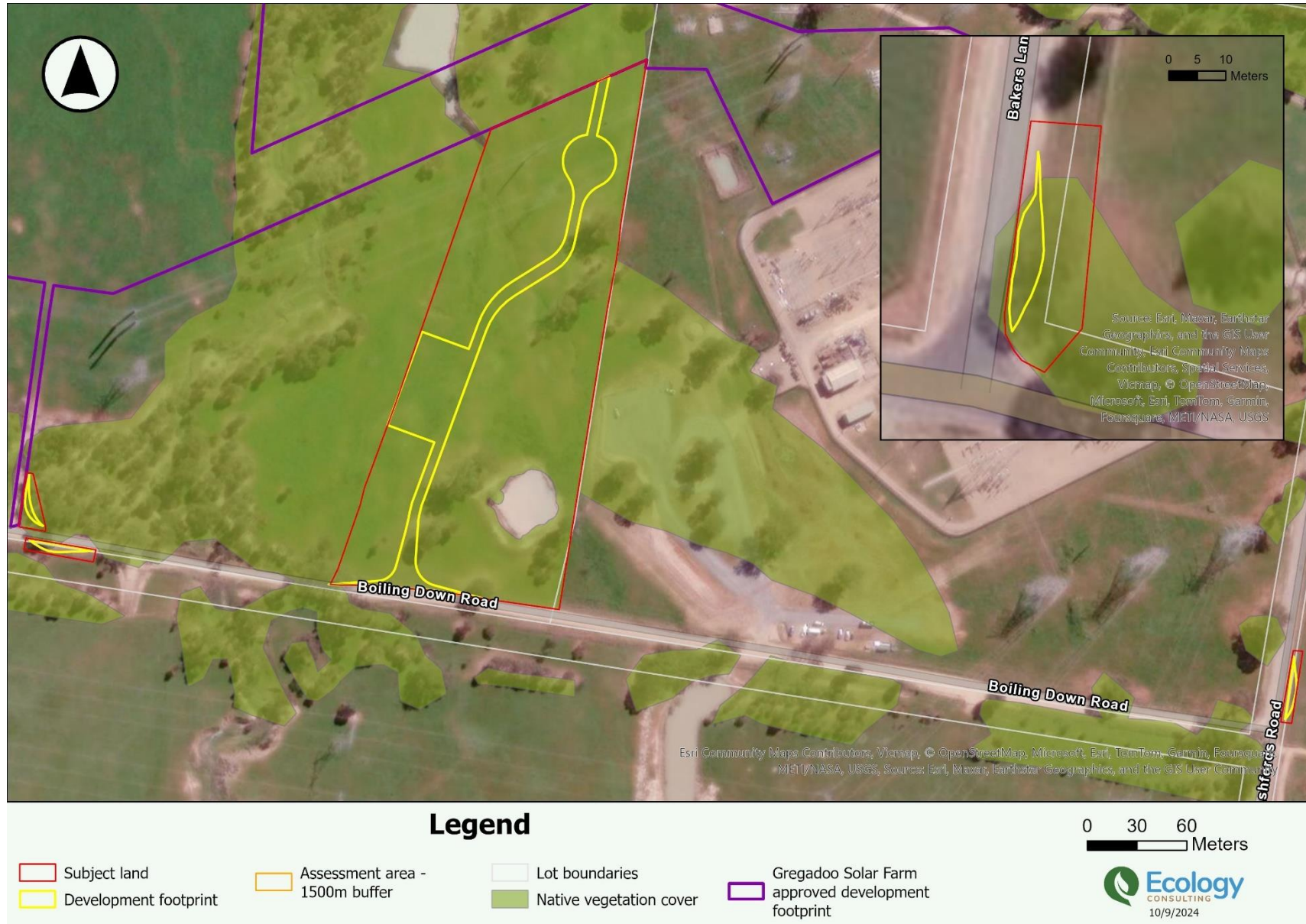


FIGURE 10: PLANT COMMUNITY TYPES



FIGURE 11: VEGETATION ZONES



FIGURE 12: THREATENED ECOLOGICAL COMMUNITIES



FIGURE 13: RAPTOR NEST SEARCH FIELD SURVEY



FIGURE 14: SPOTLIGHTING AND FROG SURVEYS



FIGURE 15: FINAL IMPACTS LIKELY TO OCCUR ON THE SUBJECT LAND



FIGURE 16: FLORA SPECIES POLYGONS



Legend

- Subject land

Gregadoo Solar Farm approved development footprint
- Austrostipa wakoolica and Small Scurf-pea species polygon
- Euphrasia arguta species polygon

0 30 60
Meters



FIGURE 17: FAUNA SPECIES POLYGONS



FIGURE 18: SERIOUS AND IRREVERSIBLE IMPACT ENTITIES



Esri Community Maps Contributors, Vmap, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, Foursquare, METI/NASA, USGS, Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Legend

- Subject land
- Gregadoo Solar Farm approved development footprint
- Indirect impacts - 30m buffer
- Direct impacts - construction and operation footprint
- SAI12 - Euphrasia arguta
- SAI11 - Box-Gum Woodland CEEC

0 40 80 Meters



Appendix A: BDAR requirements compliance

TABLE A 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:	
		<input checked="" type="checkbox"/> brief description of the proposal	Section 1.1
		<input checked="" type="checkbox"/> identification of subject land boundary, including: <input checked="" type="checkbox"/> operational footprint <input checked="" type="checkbox"/> construction footprint indicating clearing associated with temporary/ancillary construction facilities and infrastructure	Section 1.1.1
		<input checked="" type="checkbox"/> general description of the subject land	Section 1.1.4
		<input checked="" type="checkbox"/> sources of information used in the assessment, including reports and spatial data	Section Error! Reference source not found.
		<input checked="" type="checkbox"/> identification and justification for entering the BOS	Section 1.2
		Maps and Tables	
		<input checked="" type="checkbox"/> Map of the subject land boundary showing the final proposal footprint, including the construction footprint for any clearing associated with temporary/ancillary construction facilities and infrastructure	Figure 15
Landscape	Sections 3.1 and 3.2, Appendix E	Information	
		Identification of site context components and landscape features, including:	
		<input checked="" type="checkbox"/> general description of subject land topographic and hydrological setting, geology and soils	Section 3.1
		<input checked="" type="checkbox"/> per cent native vegetation cover in the assessment area (as described in BAM Section 3.2)	Section 3.3
		<input checked="" type="checkbox"/> IBRA bioregions and subregions (as described in BAM Subsection 3.1.3(2.))	Section 3.2.1
		<input checked="" type="checkbox"/> rivers and streams classified according to stream order (as described in BAM Subsection 3.1.3(3.) and Appendix E)	Section 3.2.2
		<input checked="" type="checkbox"/> wetlands within, adjacent to and downstream of the site (as described in BAM Subsection 3.1.3(3.))	Section 3.2.2
		<input checked="" type="checkbox"/> connectivity of different areas of habitat (as described in BAM Subsection 3.1.3(5–6.))	Section 3.2.3

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		<input checked="" type="checkbox"/> karst, caves, crevices, cliffs, rocks and other geological features of significance and for vegetation clearing proposals, soil hazard features (as described in BAM Subsections 3.1.3(7.) and 3.1.3(12.))	Section 3.2.4
		<input checked="" type="checkbox"/> areas of outstanding biodiversity value occurring on the subject land and assessment area (as described in BAM Subsection 3.1.3(8-9.))	Section 3.2.5
		<input type="checkbox"/> any additional landscape features identified in any SEARs for the proposal	N/A
		<input checked="" type="checkbox"/> NSW (Mitchell) landscape on which the subject land occurs	Section 3.2.6
		<input checked="" type="checkbox"/> details of field reconnaissance undertaken to confirm the extent and condition of landscape features and native vegetation cover (as described in Operational Manual Stage 1 Section 2.4)	Section 2.1.2.2
		Maps and Tables	
		<input checked="" type="checkbox"/> Site Map <input checked="" type="checkbox"/> Property boundary <input checked="" type="checkbox"/> Boundary of subject land <input checked="" type="checkbox"/> Cadastre of subject land (including labelling of Lot and DP or section plan if relevant) <input checked="" type="checkbox"/> Landscape features identified in BAM Subsection 3.1.3	Figure 1
		<input checked="" type="checkbox"/> Location Map <input checked="" type="checkbox"/> Digital aerial photography at 1:1,000 scale or finer <input checked="" type="checkbox"/> Boundary of subject land <input checked="" type="checkbox"/> Assessment area (i.e., the subject land and either 1500 m buffer area or 500 m buffer for linear development) <input checked="" type="checkbox"/> Landscape features identified in BAM Subsection 3.1.3 <input checked="" type="checkbox"/> Additional detail (e.g., local government area boundaries) relevant at this scale	Figure 2
		Landscape features identified in BAM Subsection 3.1.3 and to be shown on the Site Map and/or Location Map include:	-
		<input checked="" type="checkbox"/> IBRA bioregions and subregions <input checked="" type="checkbox"/> rivers, streams, and estuaries <input checked="" type="checkbox"/> wetlands and important wetlands <input type="checkbox"/> connectivity of different areas of habitat <input checked="" type="checkbox"/> karst, caves, crevices, cliffs, rocks and other geological features of significance and if required, soil hazard features. <input type="checkbox"/> areas of outstanding biodiversity value occurring on the subject land and assessment area <input type="checkbox"/> any additional landscape features identified in any SEARs for the proposal. <input checked="" type="checkbox"/> NSW (Mitchell) landscape on which the subject land occurs	Figure 2

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		Data	
		<input checked="" type="checkbox"/> All report maps as separate jpeg files	With BOAMS submission
		Individual digital shape files of:	-
		<input checked="" type="checkbox"/> subject land boundary	With BOAMS submission
		<input checked="" type="checkbox"/> assessment area (i.e., subject land and 1500 m buffer area) boundary	With BOAMS submission
		<input checked="" type="checkbox"/> cadastral boundary of subject land	With BOAMS submission
		<input checked="" type="checkbox"/> areas of native vegetation cover	With BOAMS submission
		<input checked="" type="checkbox"/> landscape features	With BOAMS submission
Native vegetation	Chapter 4, Appendix A and Appendix H	Information	
		<input checked="" type="checkbox"/> Identify native vegetation extent within the subject land, including cleared areas and evidence to support differences between mapped vegetation extent and aerial imagery (as described in BAM Section 4.1(1-3.) and Subsection 4.1.1)	Section 4.1
		<input type="checkbox"/> Provide justification for all parts of the subject land that do not contain native vegetation (as described in BAM Subsection 4.1.2)	N/A
		<input checked="" type="checkbox"/> Review of existing information on native vegetation including references to previous vegetation maps of the subject land and assessment area (described in BAM Section 4.1(3.) and Subsection 4.1.1)	Section 4.1.1
		<input checked="" type="checkbox"/> Describe the systematic field-based floristic vegetation survey undertaken in accordance with BAM Section 4.2	Section 2.2.3
		<input type="checkbox"/> 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)	N/A
		For each PCT within the subject land, describe:	-
		<input checked="" type="checkbox"/> PCT name and ID	Section 4.2, Section 4.2.3
		<input checked="" type="checkbox"/> vegetation class	Section 4.3
		<input checked="" type="checkbox"/> extent (ha) within subject land	Table 4
		<input checked="" type="checkbox"/> evidence used to identify a PCT including any analyses undertaken, references/sources, existing vegetation maps (BAM Section 4.2(1-3.))	Section 2.2
		<input checked="" type="checkbox"/> plant species relied upon for identification of the PCT and relative abundance of each species	Section 4.2.2, Section 4.2.3

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		<input checked="" type="checkbox"/> if relevant, TEC status including evidence used to determine vegetation is the TEC (BAM Subsection 4.2.2(1-2.))	Section 4.2.2, Section 4.2.3
		<input checked="" type="checkbox"/> estimate of per cent cleared value of PCT (BAM Subsection 4.2.1(5.))	Section 4.2.2, Section 4.2.3
		Describe the vegetation integrity assessment of the subject land, including:	-
		<input checked="" type="checkbox"/> identification and mapping of Vegetation Zones (as described in BAM Subsection 4.3.1)	Section 4.3
		<input checked="" type="checkbox"/> description of Vegetation Zones within the subject land (as described in Operational Manual Stage 1 Table 2 and Subsection 3.3.2)	Section 4.3
		<input checked="" type="checkbox"/> area (ha) of each Vegetation Zone	Table 7
		<input checked="" type="checkbox"/> assessment of patch size (as described in BAM Subsection 4.3.2)	Table 7
		<input checked="" type="checkbox"/> survey effort (i.e., number of vegetation integrity survey plots) as described in BAM Subsection 4.3.4(1-2.)	Table 7
		<input type="checkbox"/> use of relevant benchmark data from BioNet Vegetation Classification (as described in BAM Subsection 4.3.3(5.))	N/A
		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):	-
		<input type="checkbox"/> identify the PCT or vegetation class for which local benchmark data will be applied <input type="checkbox"/> identify published sources of local benchmark data (if benchmarks obtained from published sources) <input type="checkbox"/> describe methods of local benchmark data collection (if reference plots used to determine local benchmark data)	N/A
		<input type="checkbox"/> provide justification for use of local data rather than BioNet Vegetation Classification benchmark values	N/A
		<input type="checkbox"/> provide written confirmation from the decision-maker that they support the use of local benchmark data	N/A
		Maps and Tables	
		<input checked="" type="checkbox"/> 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)	
		<input checked="" type="checkbox"/> Map of PCTs within the subject land (as described in BAM Section 4.2(1.))	
		<input checked="" type="checkbox"/> Map of Vegetation Zones within the subject land (as described in BAM Subsection 4.3.1)	
		<input checked="" type="checkbox"/> Map the location of floristic vegetation survey plots and vegetation integrity survey plots relative to PCT boundaries	Figure 8
		<input checked="" type="checkbox"/> Map of TEC distribution on the subject land and Table of TEC listing, status and area (ha)	

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		<input type="checkbox"/> Map of patch size locations for each native Vegetation Zone and Table of patch size areas (as described in BAM Subsection 4.3.2)	N/A
		Table of current vegetation integrity scores for each Vegetation Zone within the site and including:	-
		<input checked="" type="checkbox"/> composition condition score <input checked="" type="checkbox"/> structure condition score <input checked="" type="checkbox"/> function condition score <input checked="" type="checkbox"/> presence of hollow bearing trees	Table 9
		Data	
		<input checked="" type="checkbox"/> All report maps as separate jpeg files	With BOAMS submission
		<input checked="" type="checkbox"/> Plot field data (MS Excel format)	With BOAMS submission
		<input checked="" type="checkbox"/> Plot field datasheets	Appendix E
		Digital shape files of:	-
		<input checked="" type="checkbox"/> PCT boundaries within subject land	With BOAMS submission
		<input checked="" type="checkbox"/> TEC boundaries within subject land	With BOAMS submission
		<input checked="" type="checkbox"/> Vegetation Zone boundaries within subject land	With BOAMS submission
		<input checked="" type="checkbox"/> floristic vegetation survey and vegetation integrity plot locations	With BOAMS submission
Threatened species	Chapter 5	Information	
		Identify ecosystem credit species likely to occur on the subject land, including:	-
		<input checked="" type="checkbox"/> list of ecosystem credit species derived from the BAM-C (as described in BAM Subsection 5.1.1 and Section 5.2(1.))	Section 5.1.1
		<input checked="" type="checkbox"/> justification and supporting evidence for exclusion of any ecosystem credit species based on geographic limitations, habitat constraints or vagrancy (as described in BAM Subsections 5.2.1 and 5.2.2)	Section 5.1.1.2
		<input checked="" type="checkbox"/> justification for addition of any ecosystem credit species to the list	Section 5.1.1.1
		Identify species credit species likely to occur on the subject land, including:	-
		<input checked="" type="checkbox"/> list of species credit species derived from the BAM-C (as described in BAM Subsection 5.1.1)	Section 5.1.2
		<input checked="" type="checkbox"/> justification and supporting evidence for exclusions based on geographic limitations, habitat constraints or vagrancy (as described in BAM Subsections 5.2.1 and 5.2.2)	Section 5.1.2.2, Section 5.1.2.4
		<input checked="" type="checkbox"/> justification and supporting evidence for exclusions based on degraded habitat constraints and/or microhabitats on which the species depends (as described in BAM Subsection 5.2.2)	Section 5.1.2.2, Section 5.1.2.4

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		<input checked="" type="checkbox"/> justification for addition of any species credit species to the list	Section 5.1.2.1, Section 5.1.2.3
		From the list of candidate species credit species, identify:	-
		<input checked="" type="checkbox"/> species assumed present within the subject land (if relevant) (as described in BAM Subsection 5.2.4(2. a.)) <input checked="" type="checkbox"/> 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.)) <input checked="" type="checkbox"/> species for which targeted surveys are to be completed to determine species presence (BAM Subsection 5.2.4(2. b.)) <input type="checkbox"/> species for which an expert report is to be used to determine species presence (BAM Subsection 5.2.4(2. c.))	Table 11, Table 12
		Present the outcomes of species credit species assessments from:	-
		<input checked="" type="checkbox"/> threatened species survey (as described in BAM Section 5.2.4)	Table , Table
		<input type="checkbox"/> 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)	N/A
		Where survey has been undertaken include detailed information on:	-
		<input checked="" type="checkbox"/> survey method and effort (as described in BAM Section 5.3)	Table , Table
		<input type="checkbox"/> 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	N/A
		<input checked="" type="checkbox"/> 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	Table , Table , Section 5.4
		<input checked="" type="checkbox"/> survey personnel and relevant experience	Declarations ii
		<input checked="" type="checkbox"/> describe any limitations to surveys and how these were addressed/overcome	Section 5.2.1, Section 5.3.1
		Where an expert report has been used in place of survey (as described in BAM Section 5.3, Box 3), include:	-
		<input type="checkbox"/> justification of the use of an expert report <input type="checkbox"/> identify the expert, provide evidence of their expert credentials and departmental approval of expert status <input type="checkbox"/> all requirements of Box 3 have been addressed in the expert report	N/A
		Where use of local data is proposed (BAM Subsection 1.4.2):	-
		<input type="checkbox"/> identify relevant species <input type="checkbox"/> identify data to be amended <input type="checkbox"/> identify source of information for local data, e.g., published literature, additional survey data, etc.	N/A

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		<input type="checkbox"/> justify use of local data in preference to VIS Classification or TBDC data	
		<input type="checkbox"/> provide written confirmation from the decision-maker that they support the use of local data	N/A
		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:	-
		<input checked="" type="checkbox"/> the unit of measure for each species is documented	Section 5.4
		for species assessed by area:	-
		<input checked="" type="checkbox"/> the polygon includes the extent of suitable habitat for the target species within the subject land (as described in BAM Subsection 5.2.5)	Figure 16
		<input checked="" type="checkbox"/> a description of, and evidence-based justification for, the habitat constraints, features or microhabitats used to map the species polygon including reference to information in the TBDC for that species and any buffers applied	Section 5.4
		for species assessed by counts of individuals:	-
		<input type="checkbox"/> the number of individual plants present on the subject land (as described in BAM Subsection 5.2.5(3.))	n/a
		<input type="checkbox"/> the method used to derive this number (i.e., threatened species survey or expert report) and evidence-based justification for the approach taken	n/a
		<input type="checkbox"/> 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	n/a
		<input type="checkbox"/> Identify the biodiversity risk weighting for each species credit species identified as present within the subject land (as described in BAM Section 5.4)	n/a
		Maps and Tables	
		<input checked="" type="checkbox"/> Table showing ecosystem credit species in accordance with BAM Subsection 5.1.1, and identifying:	Table 10
		<input checked="" type="checkbox"/> the ecosystem credit species removed from the list	Table 10
		<input checked="" type="checkbox"/> the sensitivity to gain class of each species	Table 10
		<input checked="" type="checkbox"/> Table detailing species credit species in accordance with BAM Section 5.2 and identifying:	-
		<input checked="" type="checkbox"/> 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 11, Table 12
		<input checked="" type="checkbox"/> the candidate species credit species not recorded on the subject land as determined by targeted survey, expert report or important habitat map	Table , Table
		<input checked="" type="checkbox"/> 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	Table , Table

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		suitable habitat (flora and fauna) (as described in BAM Subsection 5.2.6) and biodiversity risk weighting (BAM Section 5.4)	
		<input checked="" type="checkbox"/> 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 16
		Data	
		<input checked="" type="checkbox"/> Digital shape files of suitable habitat identified for survey for each candidate species credit species	With BOAMS submission
		<input checked="" type="checkbox"/> Survey locations including GPS coordinates of any plots, transects, grids	With BOAMS submission
		<input checked="" type="checkbox"/> Digital shape files of each species polygon including GPS coordinates of located individuals	With BOAMS submission
		<input checked="" type="checkbox"/> Species polygon map in jpeg format	With BOAMS submission
		<input type="checkbox"/> Expert reports and any supporting data used to support conclusions of the expert report	N/A
		<input type="checkbox"/> Field datasheets detailing survey information including prevailing conditions, date, time, equipment used, etc.	N/A
Prescribed impacts	Chapter 6	Information	
		Identify potential prescribed biodiversity impacts on threatened entities, including:	-
		<input checked="" type="checkbox"/> karst, caves, crevices, cliffs, rocks and other geological features of significance (as described in BAM Subsection 6.1.1) <input checked="" type="checkbox"/> occurrences of human-made structures and non-native vegetation (as described in BAM Subsection 6.1.2) <input checked="" type="checkbox"/> corridors or other areas of connectivity linking habitat for threatened entities (as described in BAM Subsection 6.1.3) <input checked="" type="checkbox"/> waterbodies or any hydrological processes that sustain threatened entities (as described in BAM Subsection 6.1.4)	Section 8.3, Table 17
		<input type="checkbox"/> 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
		<input checked="" type="checkbox"/> 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)	Section 8.3.7
		<input type="checkbox"/> Identify a list of threatened entities that may be dependent upon or may use habitat features associated with any of the prescribed impacts	N/A
		<input type="checkbox"/> 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)	N/A
		Where the proposed development is for a wind farm:	-

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		<input type="checkbox"/> 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
		<input type="checkbox"/> 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
		<input type="checkbox"/> 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:	-
		<input checked="" type="checkbox"/> 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	Section 8.3.7
		Maps and Tables	
		<input checked="" type="checkbox"/> Map showing location of any prescribed impact features (i.e., karst, caves, crevices, cliffs, rocks, human-made structures, etc.)	Figure
		<input type="checkbox"/> Map showing location of potential vehicle strike locations	N/A
		<input type="checkbox"/> 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	
		<input checked="" type="checkbox"/> Digital shape files of prescribed impact feature locations	With BOAMS submission
		<input checked="" type="checkbox"/> Prescribed impact features map in jpeg format	With BOAMS submission
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:	-
		<input checked="" type="checkbox"/> modes or technologies that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed mode or technology	Section 7.1, Section 7.2
		<input type="checkbox"/> routes that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed route	N/A
		<input type="checkbox"/> alternative locations that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed location	N/A
		<input type="checkbox"/> 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	N/A

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		<input checked="" type="checkbox"/> Describe efforts to avoid and minimise impacts (including prescribed impacts) to biodiversity values through proposal design (as described in BAM Sections 7.1 and 7.2)	Section 7.1.1
		<input checked="" type="checkbox"/> Identification of any other site constraints that the proponent has considered in determining the location and design of the proposal (as described in BAM Subsection 7.2.1(3.))	Section 7.1.2
		<input checked="" type="checkbox"/> Detail measures or options considered but not implemented because they are not feasible and/or practical (e.g., due to site constraints)	Section 7.3
		Maps and Tables	
		<input checked="" type="checkbox"/> Table of measures to be implemented to avoid and minimise the impacts of the proposal, including action, outcome, timing, and responsibility	Table , Table
		<input type="checkbox"/> Map of alternative footprints considered to avoid or minimise impacts on biodiversity values; and of the final proposal footprint, including construction and operation	N/A
		<input checked="" type="checkbox"/> Maps demonstrating indirect impact zones where applicable	Figure
		Data	
		Digital shape files of:	-
		<input checked="" type="checkbox"/> alternative and final proposal footprint	With BOAMS submission
		<input checked="" type="checkbox"/> direct and indirect impact zones	With BOAMS submission
		<input checked="" type="checkbox"/> Maps in jpeg format	With BOAMS submission
Assessment of impacts	Chapter 8, Sections 8.1 and 8.2	Information	
		<input checked="" type="checkbox"/> 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
		Assessment of indirect impacts on vegetation and threatened species and their habitat including (as described in BAM Section 8.2):	-
		<input checked="" type="checkbox"/> description of the nature, extent, frequency, duration, and timing of indirect impacts of the proposal	Table 22
		<input checked="" type="checkbox"/> documenting the consequences to vegetation and threatened species and their habitat including evidence-based justifications	Section 8.1
		<input checked="" type="checkbox"/> reporting any limitations or assumptions, etc. made during the assessment	Section 8.1
		<input checked="" type="checkbox"/> identification of the threatened entities and their habitat likely to be affected	Table 17
		Assessment of prescribed biodiversity impacts (as described in BAM Section 8.3) including:	-

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		assessment of the nature, extent frequency, duration, and timing of impacts on the habitat of threatened species or ecological communities associated with:	-
		<input checked="" type="checkbox"/> karst, caves, crevices, cliffs, rocks, and other features of geological significance	Section 8.3.1
		<input checked="" type="checkbox"/> human-made structures	Section 8.3.2
		<input checked="" type="checkbox"/> non-native vegetation	Section 8.3.3
		<input checked="" type="checkbox"/> connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range	Section 8.3.5
		<input type="checkbox"/> movement of threatened species that maintains their life cycle	N/A
		<input checked="" type="checkbox"/> water quality, waterbodies and hydrological processes that sustain threatened species and threatened ecological communities	Section 8.3.6
		<input type="checkbox"/> assessment of the impacts of wind turbine strikes on protected animals	n/a
		<input checked="" type="checkbox"/> assessment of the impacts of vehicle strikes on threatened species of animals or on animals that are part of a TEC	Section 8.3.7
		<input checked="" type="checkbox"/> evaluate the consequences of prescribed impacts	Section 8.3
		<input checked="" type="checkbox"/> describe impacts that are uncertain	Section 8.3
		<input checked="" type="checkbox"/> document limitations to data, assumptions, and predictions	Section 8.3
		Maps and Tables	
		<input checked="" type="checkbox"/> Table showing change in vegetation integrity score for each Vegetation Zone as a result of identified impacts	Table
		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:	-
		<input checked="" type="checkbox"/> techniques, timing, frequency, and responsibility	Table
		<input checked="" type="checkbox"/> identify measures for which there is risk of failure	
		<input checked="" type="checkbox"/> evaluate the risk and consequence of any residual impacts	
		<input checked="" type="checkbox"/> document any adaptive management strategy proposed	Section 8.5
		Identification of measures for mitigating impacts related to:	-

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		<input checked="" type="checkbox"/> displacement of resident fauna (as described in BAM Subsection 8.4.1(2.)) <input checked="" type="checkbox"/> indirect impacts on native vegetation and habitat (as described in BAM Subsection 8.4.1(3.)) <input checked="" type="checkbox"/> mitigating prescribed biodiversity impacts (as described in BAM Subsection 8.4.2)	Section 8.4
		<input checked="" type="checkbox"/> Details of the adaptive management strategy proposed to monitor and respond to impacts on biodiversity values that are uncertain (BAM Section 8.5)	Section 8.5
		Maps and Tables	
		<input checked="" type="checkbox"/> 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
		Data	
		N/A	-
Impact summary	Chapter 9	Information	
		Identification and assessment of impacts on TECs and threatened species that are at risk of a serious and irreversible impacts (SAII, in accordance with BAM Section 9.1) including:	-
		<input checked="" type="checkbox"/> addressing all criteria in Subsection 9.1.1 for each TEC listed as at risk of an SAII present on the subject land	Section 9
		<input checked="" type="checkbox"/> for each TEC, report the extent of the TEC in NSW	Table
		<input type="checkbox"/> addressing all criteria in Subsection 9.1.2 for each threatened species at risk of an SAII present on the subject land	N/A
		<input type="checkbox"/> for each threatened species, report the population size in NSW	N/A
		<input checked="" type="checkbox"/> documenting assumptions made and/or limitations to information <input checked="" type="checkbox"/> documenting all sources of data, information, references used or consulted <input checked="" type="checkbox"/> clearly justifying why any criteria could not be addressed	Table
		<input checked="" type="checkbox"/> Identification of impacts requiring offset in accordance with BAM Section 9.2	Table
		<input type="checkbox"/> Identification of impacts not requiring offset in accordance with BAM Subsection 9.2.1(3.)	N/A
		<input type="checkbox"/> Identification of areas not requiring assessment in accordance with BAM Section 9.3	N/A
		Maps and Tables	
		<input checked="" type="checkbox"/> Map showing the extent of TECs at risk of an SAII within the subject land	Figure 18

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		<input checked="" type="checkbox"/> Map showing location of threatened species at risk of an SAI within the subject land	FIGURE 16: FLORA SPECIES POLYGONS FIGURE 17: FAUNA SPECIES POLYGONS
		Map showing location of:	-
		<input checked="" type="checkbox"/> impacts requiring offset	
		<input type="checkbox"/> impacts not requiring offset	n/a
		<input type="checkbox"/> areas not requiring assessment	n/a
		Data	
		Digital shape files of:	-
		<input checked="" type="checkbox"/> extent of TECs at risk of an SAI within the subject land	With BOAMS submission
		<input checked="" type="checkbox"/> location of threatened species at risk of an SAI within the subject land	With BOAMS submission
		<input checked="" type="checkbox"/> boundary of impacts requiring offset	With BOAMS submission
		<input type="checkbox"/> boundary of impacts not requiring offset	n/a
		<input type="checkbox"/> boundary of areas not requiring assessment	n/a
		<input checked="" type="checkbox"/> Maps in jpeg format	With BOAMS submission
Impact summary	Chapter 10	Information	
		Ecosystem credits and species credits that measure the impact of the development on biodiversity values, including:	-
		<input checked="" type="checkbox"/> future vegetation integrity score for each Vegetation Zone within the subject land (Equation 25 and Equation 26 in BAM Appendix H) <input checked="" type="checkbox"/> change in vegetation integrity score (BAM Subsection 8.1.1) <input checked="" type="checkbox"/> 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)	Table
		<input checked="" type="checkbox"/> biodiversity risk weighting for each	Table
		<input type="checkbox"/> number of required species credits for each candidate threatened species that is directly impacted on by the proposal (BAM Subsection 10.1.3)	N/A

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		Maps and Tables	
		<input checked="" type="checkbox"/> Table of PCTs requiring offset and the number of ecosystem credits required	Table
		<input type="checkbox"/> Table of threatened species requiring offset, and the number of species credits required	N/A
		Data	
		<input checked="" type="checkbox"/> Submitted proposal in the BAM Calculator	With BOAMS submission
Biodiversity credit report	Chapter 10	Information	
		<input checked="" type="checkbox"/> Description of credit classes for ecosystem credits and species credits at the development or clearing site or land to be biodiversity certified (BAM Section 10.2)	Table 28 and Table 29
		<input checked="" type="checkbox"/> BAM credit report in pdf format	Appendix H
		Maps and Tables	
		<input checked="" type="checkbox"/> Table of credit class and matching credit profile	Table 28 and Table 29
		Data	
		<input checked="" type="checkbox"/> BAM credit report in pdf format	Appendix H

Appendix B: Biodiversity Values Map and Threshold tool report



Department of Planning and Environment

Biodiversity Values Map and Threshold Report

This report is generated using the Biodiversity Values Map and Threshold (BMAT) tool. The BMAT tool is used by proponents to supply evidence to your local council to determine whether or not a Biodiversity Development Assessment Report (BDAR) is required under [the Biodiversity Conservation Regulation 2017 \(Cl. 7.2 & 7.3\)](#).

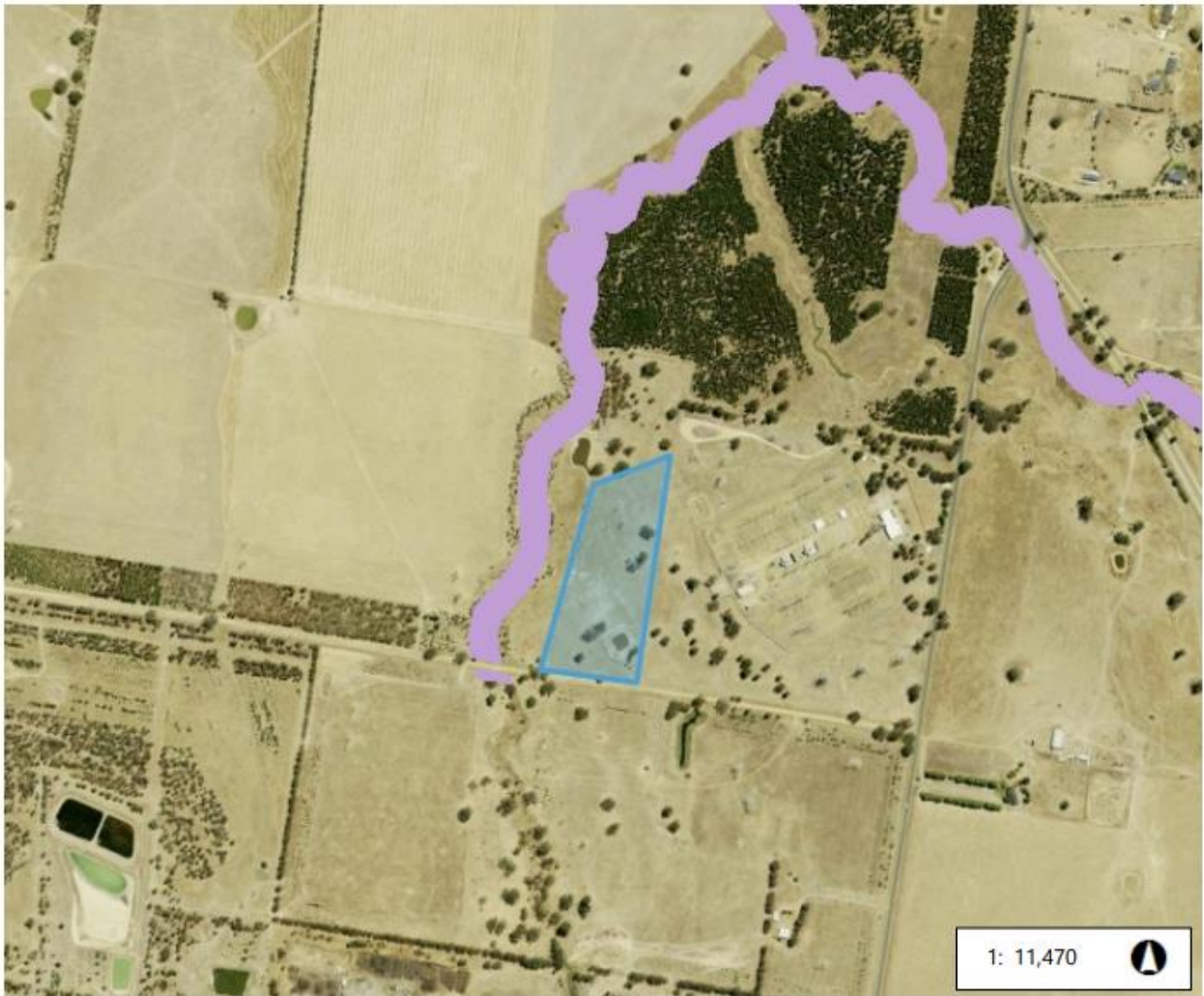
The report provides results for the proposed development footprint area identified by the user and displayed within the blue boundary on the map.

There are two pathways for determining whether a BDAR is required for the proposed development:

1. Is there Biodiversity Values Mapping?
2. Is the 'clearing of native vegetation area threshold' exceeded?

Biodiversity Values Map and Threshold Report		
Date of Report Generation		06/06/2024 8:04 PM
1. Biodiversity Values (BV) Map - Results Summary (Biodiversity Conservation Regulation Section 7.3)		
1.1	Does the development Footprint intersect with BV mapping?	no
1.2	Was <u>ALL</u> BV Mapping within the development footprinted added in the last 90 days? (dark purple mapping only, no light purple mapping present)	no
1.3	Date of expiry of dark purple 90 day mapping	N/A
1.4	Is the Biodiversity Values Map threshold exceeded?	no
2. Area Clearing Threshold - Results Summary (Biodiversity Conservation Regulation Section 7.2)		
2.1	Size of the development or clearing footprint	40,096.4 sqm
2.2	Native Vegetation Area Clearing Estimate (NVACE) (within development/clearing footprint)	1,200.9 sqm
2.3	Method for determining Minimum Lot Size	LEP
2.4	Minimum Lot Size (10,000sqm = 1ha)	2,000,000 sqm
2.5	Area Clearing Threshold (10,000sqm = 1ha)	10,000 sqm
2.6	Does the estimate exceed the Area Clearing Threshold? (NVACE results are an estimate and can be reviewed using the Guidance)	no
REPORT RESULT: Is the Biodiversity Offset Scheme (BOS) Threshold exceeded for the proposed development footprint area? (Your local council will determine if a BDAR is required)		no





Biodiversity Values Map



582.7 0 291.34 582.7 Metres

WGS_1984_Web_Mercator_Auxiliary_Sphere

Legend

-  Biodiversity Values that have been mapped for more than 90 days
-  Biodiversity Values added within last 90 days
-  Native Vegetation Area Clearing Estimate (NVACE)
-  Development area selected by proponent

06/06/2024 08:04 PM

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

Imagery © Airbus DS/Spot Image 2016

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The results provided in this tool are generated using the best available mapping and knowledge of species habitat requirements.

This map is valid as at the date the report was generated. Checking the [Biodiversity Values Map viewer](#) for mapping updates is recommended.

Appendix C: Likelihood of occurrence assessment

A likelihood of occurrence assessment was undertaken for Commonwealth EPBC Act, NSW BC Act and NSW FM Act listed threatened entities. For ease of reference, the following acronyms are used to indicate the status of a community or species according to each jurisdiction:

CE	Critically Endangered
E	Endangered
V	Vulnerable
P	Species where only certain geographically defined populations are protected
M	Listed migratory species under the EPBC Act
–	Not listed

The following analysis also incorporates data from a variety of sources including the:

- EPBC PMST report generated on 20 August 2024 (with a 10 km buffer of the subject land)
- Atlas of Living Australia (ALA) for the area within 10 km of the subject land,
- Atlas of NSW Wildlife (BioNet) for the area within a 10 km radius of the study area, and

The terms for likelihood of occurrence are defined below:

- **Known** = the species was or has been observed on the site
- **Likely** = a medium to high probability that a species uses the site
- **Potential** = suitable habitat for a species occurs on the site, but there is insufficient information to categorise the species as likely to occur, or unlikely to occur
- **Unlikely** = a very low to low probability that a species uses the site
- **No** = only applicable to Threatened Ecological Communities.

Information on species distribution and habitat has been summarised from the BioNet species profile, SPRAT profile, relevant literature (where cited) and personal accounts/knowledge from ecologists preparing this report.

TABLE C 1: LIKELIHOOD OF OCCURRENCE OF THREATENED ECOLOGICAL COMMUNITIES

Scientific name	Common name	EPBC Act status (Cwlth)	BC Act status (NSW)	Distribution and Habitat	Likelihood of Occurrence
Coolac-Tumut Serpentinite Shrubby Woodland in the NSW South Western Slopes and South Eastern Highlands Bioregions	Coolac-Tumut Serpentinite Shrubby Woodland	–	E	Occurs in the Tumut – Coolac - Gundagai area, with its largest occurrence on the Honeysuckle range to the east of Tumut, extending from Argalong to the Murrumbidgee River. This community is restricted to soils derived from serpentinite and occurs as a shrubby woodland with an overstorey often dominated by Drooping Sheoak (<i>Allocasuarina verticillata</i>).	No – this community was not identified within the subject land. The subject land does not contain soils derived from serpentinite or Drooping Sheoak.
Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	Fuzzy Box Woodland	–	E	Occurs in the South West Slopes, Brigalow Belt South and Darling Riverine Plains Bioregions. Most of its distribution found in the Dubbo-Narromine-Parkes-Forbes area. This community occurs as a tall woodland or open forest dominated by Fuzzy Box (<i>Eucalyptus conica</i>) growing on brown loam or clay and alluvial or colluvial soils in areas of slight depression, steams and channels, and undulating plains. It often occurs upslope from River Red Gum communities above regularly inundated areas of the floodplain.	No – this community was not identified within the subject land. The subject land does not contain the dominant associated tree species of this community.
Grey Box Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Grey Box Woodland	E	–	An open woodland that is characterised by its presence of Grey Box (<i>Eucalyptus microcarpa</i>). In NSW it occurs in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions. Generally, it occurs in landscapes of low relief including flats, undulating plains, low slopes and rises, and occasionally drainage depressions and flats. It may extend to more elevated hillslopes on the fringes of its range where it intergrades with other woodland or dry sclerophyll forest communities. Mainly occurs on productive soils derived from alluvial or colluvial materials but may occur on a range of substrates.	No – this community was not identified within the subject land. Further description and justification provided below this table and in Section 4.4.2 .
Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	Inland Grey Box Woodland	–	E	An open woodland that is characterised by its presence of Grey Box. It occurs mainly within the Riverina and South West Slopes Bioregions of NSW, south to the Victorian border. It is present east to Albury and may extend out west towards Hay. This community also extends across the slopes and plains in Central and Northern NSW and includes the Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions. Associated with fertile soils of the western slopes and plains of NSW, generally occurring in areas where annual rainfall is 375- 800 mm and mean maximum annual temperature is 22- 26°C.	Yes – this community was identified as occurring within the subject land due to the dominant overstorey presence of Grey Box.

Scientific name	Common name	EPBC Act status (Cwlth)	BC Act status (NSW)	Distribution and Habitat	Likelihood of Occurrence
Mallee and Mallee-Broombush dominated woodland and shrubland, lacking Triodia, in the NSW South Western Slopes Bioregion	Mallee and Mallee-Broombush dominated woodland and shrubland	–	CE	<p>Occurs only in the NSW South Western Slopes Bioregion where it has a highly restricted distribution, with known occurrences present within a region of less than 4000 km² bounded by Ungarie, Ardelethan, Temora and Lake Cowal. Most of the remaining community occurs on roadside verges or private property, though small areas are known from Nature Reserves such as South West Woodland.</p> <p>This community has three listed composition variations:</p> <ul style="list-style-type: none"> • Bull Mallee and White Mallee dominant variant which typically occurs on plains to the east and north of West Wyalong on red earths, • Blue Mallee, Bull Mallee and Green Mallee dominant variant which typically occurs on low hills and rises on sandy loam soils over substrates, and • Broombush, Green Mallee and Blue Mallee dominant variant which occurs in loamy sands on rocky rises of sandstone and other sedimentary rock types, generally south west of West Wyalong. 	No – this community was not identified within the subject land. The subject land does not contain the dominant associated tree species of this community.
Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion	Monaro Tableland Cool Temperate Grassy Woodland	–	CE	<p>Occurs as a grassy woodland mostly dominated by Snow Gum (<i>Eucalyptus pauciflora</i>) in the Southern Tablelands of NSW in the South Eastern Highlands Bioregion. It occupies broad valley floors, slopes and low rises of the moderately undulating tablelands and found on a wide variety of substrates including basalt, granite, acid volcanics, fine-grained sedimentary rocks and alluvium. Occurs between Captains Flat in the north and Bombala in the south. Its eastern boundary corresponds roughly with the crest of the Great Dividing Range. Due to the elevated rainfall of on the Monaro Tableland, the western distribution of the community is discontinuous with the distribution in the east, except for the areas of higher rainfall at the southern end of the Monaro plain.</p>	No – this community was not identified within the subject land. The subject land is not present within the geographic range of this community and does not contain the dominant associated tree species.
Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Penepplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions	Myall Woodland	–	E	<p>This community generally occurs as a low woodland to low open woodland which always include Weeping Myall (<i>Acacia pendula</i>) and is wide spread and known from the Brigalow Belt South, Cobar Penepplain, Darling Riverine Plains, Murray Darling Depressions, Riverina and NSW South Western Slopes Bioregions.</p> <p>Generally, it occurs on red and brown earths and heavy textured grey and brown alluvial soils within a climatic belt receiving between 375 and 500 mm mean annual rainfall. The vegetation structure of the community depends on site quality and disturbance history and may vary from low woodland and low open woodland to low sparse woodland or open shrubland.</p>	No – this community was not identified within the subject land. The subject land does not contain the dominant associated tree species of this community.

Scientific name	Common name	EPBC Act status (Cwlth)	BC Act status (NSW)	Distribution and Habitat	Likelihood of Occurrence
Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions		–	E	<p>Occurs as an open woodland dominated by White Cypress Pine (<i>Callitris glaucophylla</i>) in the far south-west portion of the NSW South Western Slopes Bioregion near Urana, extending through the Riverina Bioregion. Is also known from the southern part of the Murray-Darling Depression Bioregion.</p> <p>The community varies across its distribution. It typically occurs on red and brown loam sands on the alluvial plains of the Murray River, and on parts of the sandplain in south-western NSW. In the Riverina Bioregion and the far south-west portion of the NSW South Western Slopes Bioregion, it is mostly associated prior streams and aeolian source-bordering dunes scattered within an extensive alluvial clay plain</p>	No – this community was not identified within the subject land. The subject land does not contain the dominant associated tree species of this community.
Weeping Myall Woodlands	Weeping Myall Woodlands	E	–	<p>This community occurs west of the Great Dividing Range in NSW in the Riverina, NSW South Western Slopes, Darling Riverine Plains, Brigalow Belt South, Brigalow Belt North, Murray-Darling Depression, Nandewar and Cobar Peneplain Bioregions.</p> <p>It is characterised by moderate to tall open woodland to woodland, in which Weeping Myall (<i>Acacia pendula</i>) trees are the sole or dominant canopy species. Generally, it occurs on flats, shallow depressions or gilgais on raised alluvial plains formed from black, brown, red-brown or grey clay or clay loam soils. These areas are not associated with active drainage channels and are rarely if ever flooded.</p>	No – this community was not identified within the subject land. The subject land does not contain the dominant associated tree species of this community.
Werriwa Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands and South East Corner Bioregion	Werriwa Tableland Cool Temperate Grassy Woodland	–	CE	<p>This community occurs as grassy woodland by Snow Gum (<i>E. pauciflora</i>) in the Southern Tablelands of NSW and South Eastern Highlands and South East Corner Bioregions.</p> <p>It occupies broad valley floors, gentle slopes and low rises of the moderately undulating tablelands. It may occur on a wide variety of substrates including basalt, granite, acid volcanics, fine-grained sedimentary rocks and alluvium, rarely being present on steep ridge lines. The majority of this community's distribution occurs on the eastern fall of the Great Dividing Range between Golspie in the north and Majors Creek in the south.</p>	No – this community was not identified within the subject land. The subject land is not present within the geographic range of this community and does not contain the dominant associated tree species.
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Box Gum Woodland	CE	–	<p>Found from the Queensland border in the north, to the Victorian border in the south. It occurs 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. Characterised by the presence or prior occurrence of White Box, Yellow Box and/or Blakely's Red Gum and a generally grassy understory. Areas that are part of the EPBC listed ecological community must have either:</p>	No – this community was not identified within the subject land. While the subject land contains areas of the NSW listed community, these areas do not meet the condition requirements of this community. Further description and justification

Scientific name	Common name	EPBC Act status (Cwlth)	BC Act status (NSW)	Distribution and Habitat	Likelihood of Occurrence
				<ul style="list-style-type: none"> An intact tree layer and predominately native ground layer; or An intact native ground layer with a high diversity of native plant species but no remaining tree layer. 	provided below this table and in Section 4.4.2.
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	–	CE	<p>Found from the Queensland border in the north, to the Victorian border in the south. It occurs 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. Characterised by the presence or prior occurrence of White Box, Yellow Box and/or Blakely's Red Gum and a generally grassy understory.</p> <p>The TEC is also characterised by a certain grass and forb species that tend to persist on sites even if the tree canopy is removed. Such derived native grassland may still be protected under relevant legislation and can regenerate to woodland under the right conditions.</p>	Yes – this community was identified as occurring within the subject land due to the dominant overstorey presence of Yellow Box and Blakely's Red Gum, particularly directly surrounding sections of the subject land.

FIGURE C 1: GREY BOX WOODLAND FLOWCHART 1 (DSEWP, 2012)

Flowchart 1: Could a nationally threatened grassland or grassy woodland community be present?

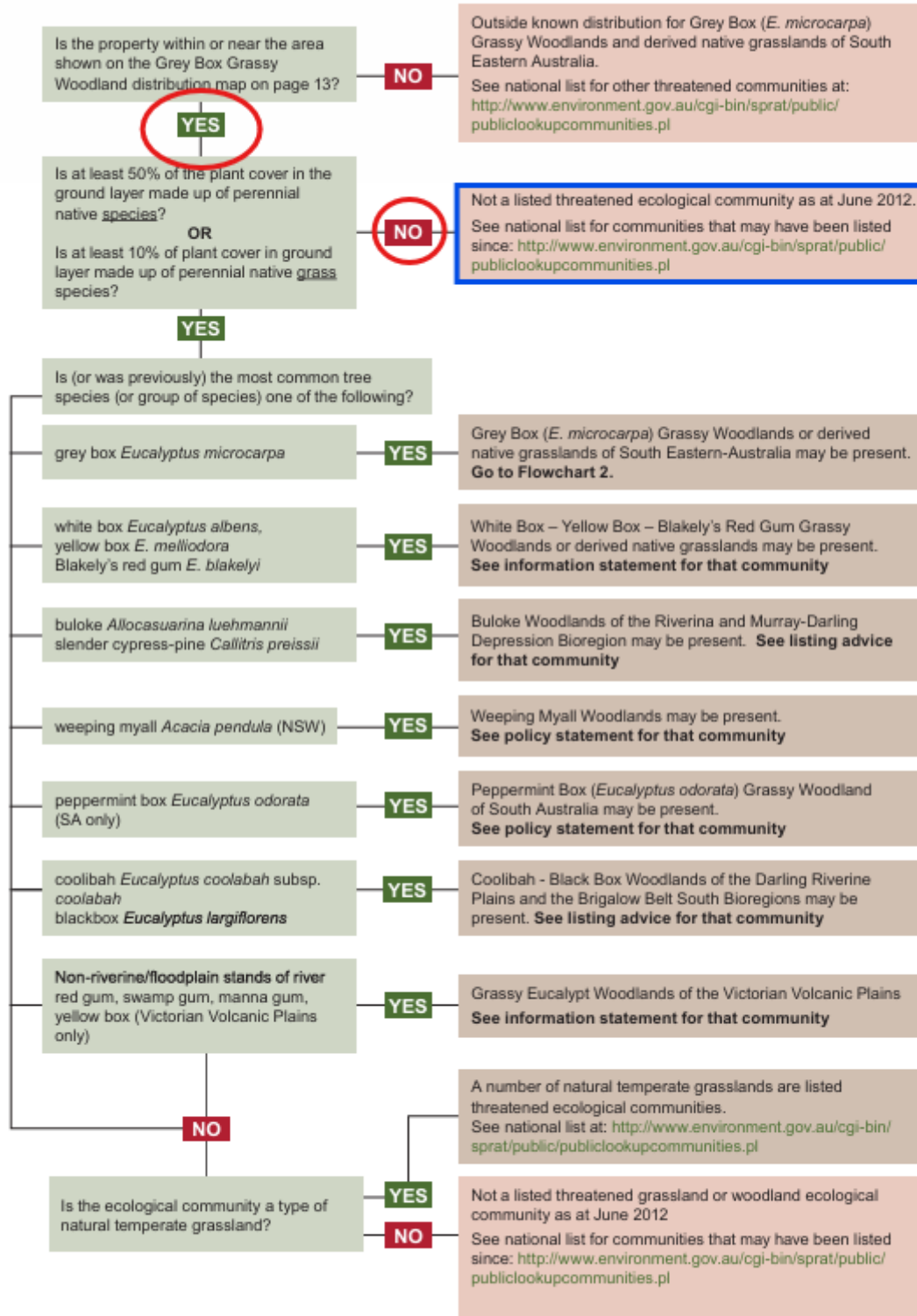
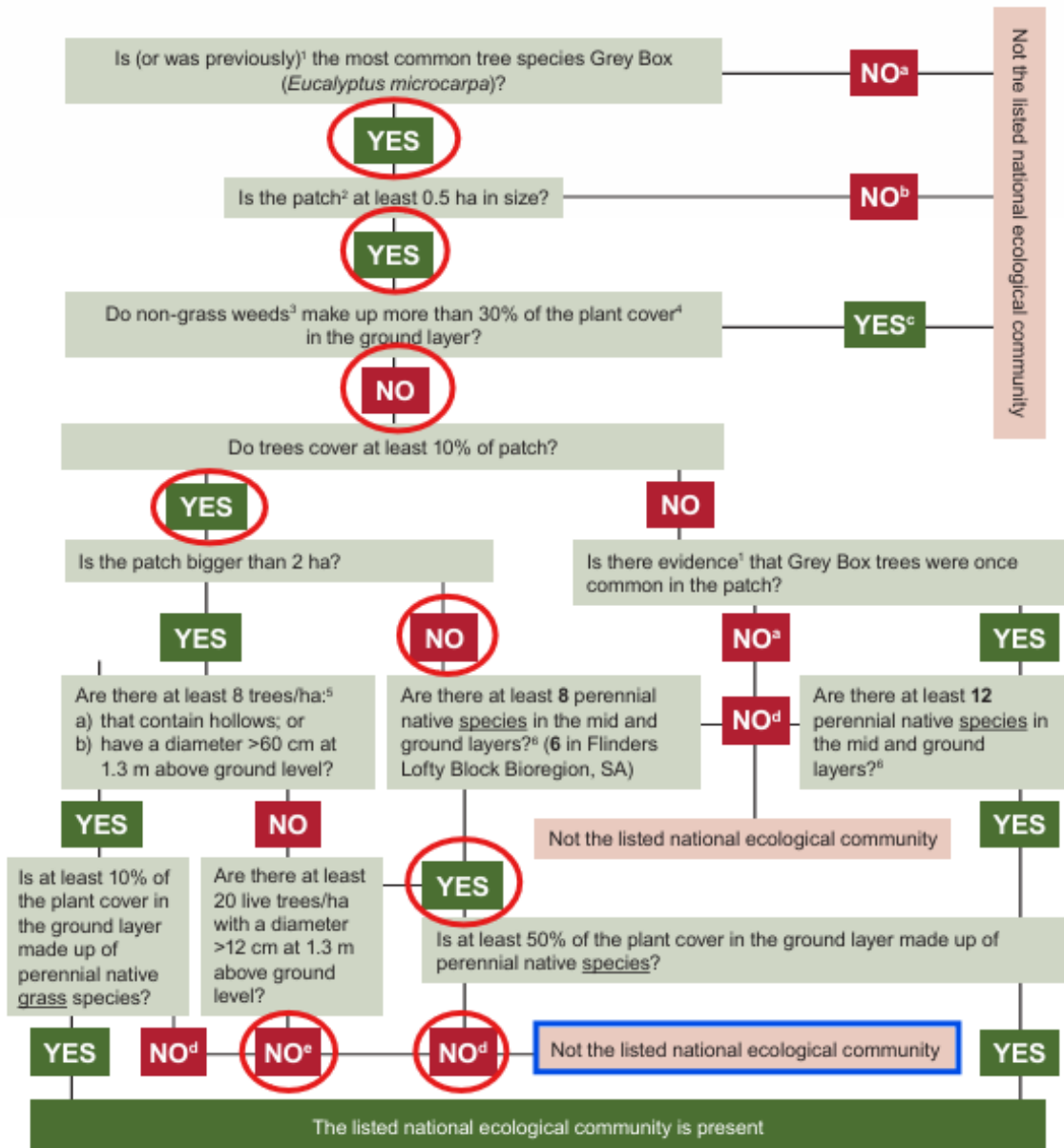


FIGURE C 2: GREY BOX WOODLAND FLOWCHART 2 (DSEWP, 2012)

Flowchart 2: Is the patch of potential Grey Box (*E. microcarpa*) Grassy Woodlands or derived native grasslands of sufficient quality for national listing?



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



TABLE C 2: LIKELIHOOD OF OCCURRENCE OF THREATENED SPECIES

Scientific name	Common name	EPBC Act Status (Cwlth)	BC Act Status (NSW)	ALA records	BioNet records	Distribution and Habitat	Likelihood of Occurrence	Habitat directly or indirectly impacted	EPBC Act Impact assessment required
Flora									
<i>Acacia ausfeldii</i>	Ausfeld's Wattle	–	V	No	No	<p>Found to the east of Dubbo in the Mudgee-Ulan-Gulgong area of the NSW South Western Slopes bioregion, with some records in the adjoining Brigalow Belt South, South Eastern Highlands and the Sydney Basin bioregions.</p> <p>Associated species include White Box (<i>Eucalyptus albens</i>), Blakely's Red Gum (<i>E. blakelyi</i>) and native Cypress Pine (<i>Callitris</i> spp.), with an understorey dominated by <i>Cassinia</i> spp. and grasses. Likely to have a dormant soil seedbank from which germination is stimulated by fire; a small number of seeds have been observed to germinate in the absence of fire.</p>	Unlikely – Habitat degraded and sub-optimal. No records within 10 km and no evidence of this mid-stratum species during site inspections.	N/A	No
<i>Ammobium craspedioides</i>	Yass Daisy	V	V	No	No	<p>Found from near Crookwell on the Southern Tablelands to near Wagga Wagga on the South Western Slopes. Most populations are in the Yass region.</p> <p>Found in moist or dry forest communities, Box-Gum Woodland and secondary grassland derived from clearing of these communities. Grows in association with a large range of eucalypts such as Blakely's Red Gum, Apple Box (<i>E. bridgesiana</i>), Broad-leaved Peppermint (<i>E. dives</i>), Long-leaved Box (<i>E. goniocalyx</i>), Red Stringybark (<i>E. macrorhyncha</i>), Brittle Gum (<i>E. mannifera</i>), Yellow Box (<i>E. melliodora</i>), Red Box (<i>E. polyanthemos</i>) and Candlebark (<i>E. rubida</i>). Apparently unaffected by light grazing, as populations persist in some grazed sites.</p>	Unlikely – Habitat degraded and sub-optimal. No known records within 10 km and not detected during targeted surveys.	N/A	No

Scientific name	Common name	EPBC Act Status (Cwlth)	BC Act Status (NSW)	ALA records	BioNet records	Distribution and Habitat	Likelihood of Occurrence	Habitat directly or indirectly impacted	EPBC Act Impact assessment required
<i>Austrostipa wakoolica</i>	A Spear-grass	E	E	No	No	<p>Confined to the floodplains of the Murray River tributaries of central-western and south-western NSW, with localities including Manna State Forest, Matong, Lake Tooim, Merran Creek, Tulla, Cunninyeuk and Mairjimmy State Forest (now part of South West Woodland Nature Reserve).</p> <p>Grows on floodplains of the Murray River tributaries, 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 ranges; and a low, rocky rises. Associated species include White Cypress Pine (<i>Callitris glaucophylla</i>), Grey Box (<i>Eucalyptus microcarpa</i>), Poplar Box (<i>E. populnea</i>), Spear Grass (<i>Austrostipa eremophila</i> and <i>A. drummondii</i>), Hill Wallaby Grass (<i>Rytidosperma eriantha</i>) and Climbing Saltbush (<i>Einadia nutans</i>).</p>	Potential – Within the known geographic location and associated habitat found in the subject land. However, no known records within 10 km.	Yes	Yes
<i>Brachyscome muelleroides</i>	Mueller Daisy	V	V	Yes (2)	Yes (1)	<p>In NSW, occurs in the Wagga Wagga, Narranderra, Tocumwal and Walbundrie areas.</p> <p>Grows in damp areas on the margins of claypans in moist grassland with Billy Buttons (<i>Pycnosorus globosus</i>), Blowngrass (<i>Lachnagrostis filiformis</i>) and Wallaby Grass (<i>Rytidosperma duttoniana</i>). Also recorded from the margins of lagoons in mud or water, and in association with Cut-leaf Burr-daisy (<i>Calotis anthemoides</i>).</p>	Unlikely – Habitat degraded and sub-optimal. One record within 10 km, from Wagga Wagga town over 100 years ago.	N/A	No
<i>Caladenia arenaria</i>	Sand-hill Spider-orchid	E	E	No	No	<p>Found mostly on the south west plains and western south west slopes. Currently only known to occur in the Riverina between Urana and Narranderra.</p>	Unlikely – habitat within the subject land and vicinity is unsuitable. No known records within 10 km and not detected during targeted surveys.	N/A	No

Scientific name	Common name	EPBC Act Status (Cwlth)	BC Act Status (NSW)	ALA records	BioNet records	Distribution and Habitat	Likelihood of Occurrence	Habitat directly or indirectly impacted	EPBC Act Impact assessment required
						Occurs in woodland with sandy soil, especially that dominated by White Cypress Pine.			
<i>Caladenia concolor</i>	Crimson Spider-orchid	V	E	No	No	<p>There are two known populations in NSW – one on private property near Bethungra and the other in Burrinjuck Nature Reserve. The other occurrences of the Crimson Spider Orchid in NSW are from the Nail Can Hill Crown Reserve near Albury.</p> <p>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 Red Stringybark Red Box (<i>E. polyanthemos</i>) and White Box; the diverse understorey includes Silver Wattle (<i>Acacia dealbata</i>), Hop Bitter-pea (<i>Daviesia latifolia</i>), Common Beard-heath (<i>Leucopogon virgatus</i>), Blueberry Lily (<i>Dianella revoluta</i>) and Poa Tussock (<i>Poa sieberiana</i>).</p>	Unlikely – habitat within the subject land and vicinity is unsuitable. No known records within 10 km	N/A	No
<i>Cullen parvum</i>	Small Scurf-pea	–	E	Yes (1)	No	<p>There are currently four known extant populations within NSW, one in Comer Travelling Stock Reserve (TSR), one on private property near Young and two in TSRs south-west of Wagga Wagga.</p> <p>Found in grassland, River Red Gum (<i>Eucalyptus camaldulensis</i>) Woodland or Box-Gum Woodland, sometimes on grazed land and usually on table drains or adjacent to drainage lines or watercourses, in areas with rainfall of between 450 and 700 mm.</p>	Potential – Within the known geographic location and associated with species and habitat found in the subject land. One known record within 10 km.	Yes	No (not EPBC Act listed)
<i>Diuris tricolor</i>	Pine Donkey Orchid	–	V	Yes (1)	No	<p>Sporadically distributed on the western slopes of NSW, extending from south of Narrandera all the way to the north of NSW.</p> <p>Grows in sclerophyll forest among grass, often with native Cypress Pine. Found in sandy soils, either on flats or</p>	Unlikely – Habitat degraded and sub-optimal. Subject land is grazed and does not contain White Cypress Pine. No known records within 10 km and not	N/A	No

Scientific name	Common name	EPBC Act Status (Cwlth)	BC Act Status (NSW)	ALA records	BioNet records	Distribution and Habitat	Likelihood of Occurrence	Habitat directly or indirectly impacted	EPBC Act Impact assessment required
						small rises. Also recorded from a red earth soil in a Bimble Box community in western NSW.	detected during targeted surveys.		
<i>Eucalyptus nicholii</i>	Narrow-leaved Black Peppermint	V	V	Yes (1)	No	Found on the New England Tablelands from Nundle to north of Tenterfield, being most common in central portions of its range. Planted as urban trees, windbreaks and corridors. Typically grows in dry grassy woodland, on shallow soils of slopes and ridges. Found primarily on infertile soils derived from granite or metasedimentary rock.	Unlikely – Habitat degraded and sub-optimal. No evidence of this overstorey species was recorded during site inspections.	N/A	No
<i>Euphrasia arguta</i>	n/a	CE	CE	No	No	Rediscovered in the Nundle area of the NSW north western slopes and tablelands in 2008. Historically, only been recorded from relatively few places from Sydney to Bathurst and north to Walcha. Historic records of the species noted the following habitats: 'in the open forest country around Bathurst in sub humid places', 'on the grassy country near Bathurst', and 'in meadows near rivers'. Plants from the Nundle area have been reported from eucalypt forest with a mixed grass and shrub understorey; here, plants were most dense in an open disturbed area and along the roadside, indicating the species had regenerated following disturbance.	Potential – Within the known geographic location and associated with species and habitat found in the subject land. However, no known records within 10 km.	Yes	Yes
<i>Indigofera efoliata</i>	Leafless Indigo	E	E	No	No	Very rare and was presumed extinct until the species was rediscovered in spring 2021 near Geurie. Was only known only from a few collections in the Dubbo area. Known sites were located along the Dubbo to Minore railway line and road, on Wallaringa and Geurie properties and in Goonoo State Forest.	Unlikely – Habitat degraded and sub-optimal. No known records within 10 km and not detected during targeted surveys.	N/A	No

Scientific name	Common name	EPBC Act Status (Cwlth)	BC Act Status (NSW)	ALA records	BioNet records	Distribution and Habitat	Likelihood of Occurrence	Habitat directly or indirectly impacted	EPBC Act Impact assessment required
						<p>Herbarium records note the species as growing on slight rises amongst ironstone formation in stony red-brown sandy loam. Recorded in Goonoo State Forest in Narrow-leaved Ironbark (<i>Eucalyptus crebra</i>) and White Cypress Pine dry sclerophyll forest, and in Grey Box and White Cypress Pine tall woodland.</p> <p>Associated species include Bulloak (<i>Allocasuarina luehmannii</i>), Cherry Ballart (<i>Exocarpos cupressiformis</i>), Yellow Box, Box-leaf Wattle (<i>Acacia buxifolia</i>), Mudgee Wattle (<i>Acacia spectabilis</i>), False Sandalwood (<i>Eremophila mitchellii</i>), Sticky Hop-bush (<i>Dodonaea viscosa</i>), Dogwood (<i>Cassinia aculeata</i>) and Peach Heath (<i>Lissanthe strigosa</i>).</p>			
<i>Lepidium aschersonii</i>	Spiny Pepper-cress	V	V	No	No	<p>Not widespread, occurring in the marginal central-western slopes and north-western plains regions of NSW (and potentially the south western plains).</p> <p>Found on ridges of gilgai clays dominated by Brigalow, Belah, Buloke and Grey Box. In the south has been recorded growing in Bull Mallee. Often the understory is dominated by introduced plants. Vegetation structure varies from open to dense, with sparse grassy understory and occasional heavy litter.</p>	Unlikely – Habitat degraded and sub-optimal. Not recorded during site inspections. No known records within 10 km.	N/A	No
<i>Lepidium monoplocoides</i>	Winged Pepper-cress	E	E	No	No	<p>Widespread in the semi-arid western plains regions of NSW.</p> <p>Occurs on seasonally moist to waterlogged sites, on heavy fertile soils, with a mean annual rainfall of around 300-500 mm. Predominant vegetation is usually an open woodland dominated by Buloke</p>	Unlikely – Habitat degraded and sub-optimal. Not recorded during site inspections. No known records within 10 km.	N/A	No

Scientific name	Common name	EPBC Act Status (Cwlth)	BC Act Status (NSW)	ALA records	BioNet records	Distribution and Habitat	Likelihood of Occurrence	Habitat directly or indirectly impacted	EPBC Act Impact assessment required
						and/or eucalypts, particularly Black Box (<i>Eucalyptus largiflorens</i>) or Poplar Box The field layer of the surrounding woodland is dominated by tussock grasses. Also recorded in a wetland-grassland community and a Black Bluebush (<i>Maireana pyramidata</i>) shrubland.			
<i>Persicaria elatior</i>	Tall Knotweed	V	V	Yes (1)	No	Has been recorded in south-eastern NSW (Mt Dromedary (an old record), Moruya State Forest near Turlinjah, the Upper Avon River catchment north of Robertson, Bermagui, and Picton Lakes. In northern NSW it is known from Raymond Terrace (near Newcastle) and the Grafton area (Cherry Tree and Gibberagee State Forests). Normally grows in damp places, especially beside streams and lakes. Occasionally in swamp forest or associated with disturbance.	Unlikely – habitat within the subject land and vicinity is unsuitable. One recorded within 10 km from Wagga Wagga town. Hydro lines within the subject land have been largely altered and degraded thorough stock grazing and compaction. Not recorded during site inspections.	N/A	No
<i>Prasophyllum petilum</i>	Tarengo Leek Orchid	E	E	No	No	Within known geographic distribution area, however natural populations are known from only a small number of sites in NSW (Boorowa, Queanbeyan area, Ilford, Delegate and Muswellbrook) and near Hall in the ACT. Grows in open sites within Natural Temperate Grassland and grassy woodland. Highly susceptible to grazing, being retained only at little-grazed travelling stock reserves and in cemeteries.	Unlikely – habitat within the subject land and vicinity is unsuitable. No known records within 10 km and not detected during targeted surveys.	N/A	No
<i>Prasophyllum petilum</i> Synonym: <i>Prasophyllum</i> sp. <i>Wybong</i>	n/a	CE	-	No	No	Known from five sites in NSW – near Boorowa, Queanbeyan area, Ilford, Delegate and 10 km west of Muswellbrook. Also occurs at Hall in the Australian Capital Territory. Grows in open sites within Natural Temperate Grassland and in grassy	Unlikely – habitat within the subject land and vicinity is unsuitable. No known records within 10 km.	N/A	No

Scientific name	Common name	EPBC Act Status (Cwlth)	BC Act Status (NSW)	ALA records	BioNet records	Distribution and Habitat	Likelihood of Occurrence	Habitat directly or indirectly impacted	EPBC Act Impact assessment required
<i>Senecio garlandii</i>	Woolly Ragwort	–	V	Yes (6)	Yes (2)	woodland. Highly susceptible to grazing. Found between Temora, Bethungra and Albury and possibly Burrinjuck near Yass. The largest populations are at The Rock and Mt Tabletop (and surrounds). Occurs on sheltered slopes of rocky outcrops.	Unlikely – habitat within the subject land and vicinity is unsuitable.	N/A	No
<i>Swainsona murrayana</i>	Slender Darling-pea	V	V	No	No	Found throughout NSW, recorded in the Jerilderie and Deniliquin areas of the southern riverine plain, the Hay plain as far north as Willandra National Park, near Broken Hill and in various localities between Dubbo and Moree. Grows in a variety of vegetation types including bladder saltbush, black box and grassland communities on level plains, floodplains and depressions and is often found with <i>Maireana</i> species. Plants have been found in remnant native grasslands or grassy woodlands that have been intermittently grazed or cultivated. Found in clay-based soils, ranging from grey, red and brown cracking clays to red-brown earths and loams.	Unlikely – Habitat degraded and sub-optimal. No known records within 10 km.	N/A	No
<i>Swainsona recta</i>	Small Purple-pea	E	E	Yes (4)	Yes (2)	Recorded historically from places such as Carcoar, Culcairn and Wagga Wagga where it is probably now extinct. Populations still exist in the Queanbeyan and Wellington-Mudgee areas. Over 80% of the southern population grows on a railway easement. Grows in association with understory dominants that include Kangaroo Grass, Poa Tussocks and Spear-grasses.	Unlikely – Habitat degraded and sub-optimal. Not detected during targeted surveys.	N/A	No

Scientific name	Common name	EPBC Act Status (Cwlth)	BC Act Status (NSW)	ALA records	BioNet records	Distribution and Habitat	Likelihood of Occurrence	Habitat directly or indirectly impacted	EPBC Act Impact assessment required
<i>Swainsona sericea</i>	Silky Swainson-pea	-	V	No	No	Recorded from the Northern Tablelands to the Southern Tablelands and further inland on the slopes and plains. There is one isolated record from the far north-west of NSW. Found in Natural Temperate Grassland and Snow Gum Eucalyptus pauciflora Woodland on the Monaro. Found in Box-Gum Woodland in the Southern Tablelands and South West Slopes. Sometimes found in association with Cypress Pines.	Unlikely – Habitat degraded and sub-optimal. No known records within 10 km and not detected during targeted surveys.	N/A	No
Birds									
<i>Anseranas semipalmata</i>	Magpie Goose	–	V	Yes (18)	No	Widespread throughout coastal northern and eastern Australia. It has been extending its range into coastal New South Wales to the Clarence River and further south. Mainly found in shallow wetlands (less than 1 m deep) with dense growth of rushes or sedges. Equally at home in aquatic or terrestrial habitats; often seen walking and grazing on land; feeds on grasses, bulbs and rhizomes.	Unlikely – Artificial dams within and adjacent to subject land degraded and suboptimal.	N/A	No
<i>Anthochaera phrygia</i>	Regent Honeyeater	CE	CE	Yes (4)	Yes (1)	In NSW the distribution is very patchy and mainly confined to the two main breeding areas and surrounding fragmented woodlands. Inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. The species prefers old growth sites with abundant mistletoe.	Unlikely – habitat within the subject land is degraded and suboptimal. Subject land is also not identified on Important Area Map.	N/A	No
<i>Aphelocephala leucopsis</i>	Southern Whiteface	V	V	Yes (46)	Yes (6)	Small stocky thornbill-like bird that occurs across most of mainland Australia south of the tropics, from the northeastern edge of the Western Australian wheatbelt, east to the Great Dividing Range.	Potential – utilisable habitat and subject land within known and predicted geographic distribution. Not observed during field surveys.	Yes	Yes

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						Occurs in a wide range of open woodlands and shrublands where there is an understory of grasses or shrubs, or both. Almost exclusively forages on the ground. Occurs across most of mainland Australia from north-east WA, east to the Great Dividing Range.			
<i>Artamus cyanopterus cyanopterus</i>	Dusky Woodswallow	–	V	Yes (170)	Yes (14)	<p>Widespread in eastern, southern and south western Australia. The species occurs throughout most of New South Wales, but is sparsely scattered in, or largely absent from, much of the upper western region. Most breeding activity occurs on the western slopes of the Great Dividing Range.</p> <p>Primarily inhabit dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris. It has also been recorded in shrublands, heathlands and very occasionally in moist forest or rainforest. Also found in farmland, usually at the edges of forest or woodland.</p>	Likely – Suitable habitat in the subject land and records within 10 km. Not observed in subject land at time of surveys	Yes	No (not EPBC Act listed)
<i>Botaurus poiciloptilus</i>	Australasian Bittern	E	E	Yes (1)	No	<p>Widespread but uncommon over south-eastern Australia. In NSW they may be found over most of the state except for the far north-west.</p> <p>Wetland specialist that favours permanent freshwater wetlands with tall, dense vegetation especially Bullrushes (<i>Typha</i> spp.) and Spikerushes (<i>Eleocharis</i> spp.).</p>	No – habitat within the subject land and vicinity is unsuitable.	N/A	No
<i>Burhinus grallarius</i>	Bush Stone-curlew	–	E	Yes (8)	Yes (4)	Found throughout Australia except for the central southern coast and inland, the far south-east corner, and Tasmania. In the south-east it is either	Unlikely – Habitat within the subject land is degraded and sub-optimal.	N/A	No

Scientific name	Common name	EPBC Act Status (Cwlth)	BC Act Status (NSW)	ALA records	BioNet records	Distribution and Habitat	Likelihood of Occurrence	Habitat directly or indirectly impacted	EPBC Act Impact assessment required
						rare or extinct throughout its former range. Inhabits open forests and woodlands with a sparse grassy groundlayer and fallen timber. Feed on insects and small vertebrates, such as frogs, lizards and snakes.			
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	V	–	Yes (26)	Yes (21)	Spends the non-breeding season in Australia with small numbers occurring regularly in New Zealand. Most of the population migrates to Australia, mostly to the south-east and are widespread in both inland and coastal locations and in both freshwater and saline habitats. Prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation.	Unlikely – wetland habitat within subject land (artificial dam) is sub-optimal.	N/A	No
<i>Calidris ferruginea</i>	Curlew Sandpiper	CE	E	Yes (4)	Yes (3)	Distributed around most of the Australian coastline (including Tasmania). Inland records are probably mainly of birds pausing for a few days during migration. Generally, occupies littoral and estuarine habitats, and in NSW is mainly found in intertidal mudflats of sheltered coasts.	Unlikely – wetland habitat within subject land (artificial dam) is sub-optimal.	N/A	No
<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	E	E	Yes (13)	Yes (3)	Distributed 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. Generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. May also occur in sub-alpine Snow Gum woodland and occasionally in temperate rainforests.	Potential – utilisable habitat and subject land within known and predicted geographic distribution. Not observed during field surveys.	Yes	Yes

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<i>Calyptorhynchus lathami lathami</i>	South-eastern Glossy Black-Cockatoo	V	V	No	Yes (6)	<p>Uncommon, although widespread throughout suitable forest and woodland habitats from the central Queensland coast to East Gippsland in Victoria, and inland to the southern Tablelands and central western plains of NSW, with a small population in the Riverina.</p> <p>Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of She-oak occur. Black She-oak (<i>Allocasuarina littoralis</i>) and Forest She-oak (<i>A. torulosa</i>) are important foods.</p>	Potential – utilisable habitat and subject land within known and predicted geographic distribution. Feed trees are not directly present in subject land, but Radiata Pine plantation is within 1 km to the north. Not observed during field surveys.	Yes	Yes
<i>Circus assimilis</i>	Spotted Harrier	–	V	Yes (11)	Yes (3)	<p>Occurs throughout the Australian mainland, except in densely forested or wooded habitats of the coast, escarpment and ranges, and rarely in Tasmania. Individuals disperse widely in NSW and comprise a single population.</p> <p>Found in grassy open woodland including Acacia and mallee remnants, inland riparian woodland, grassland and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands.</p>	Potential – utilisable habitat and subject land within known and predicted geographic distribution. Not observed during field surveys.	Yes	No (not EPBC Act listed)
<i>Climacteris picumnus victoriae</i>	Brown Treecreeper (south-eastern)	V	V	No	Yes (47)	<p>Endemic to eastern Australia and occurs in eucalypt forests and woodlands of inland plains and slopes of the Great Dividing Range. It is less commonly found on coastal plains and ranges.</p> <p>Mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understory, Hollows in standing dead or live trees and tree stumps are essential for nesting.</p>	Unlikely – Habitat within the subject land is degraded and sub-optimal.	N/A	No

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<i>Daphoenositta chrysoptera</i>	Varied Sittella	–	V	Yes (13)	Yes (4)	Occurs in most of mainland Australia except the treeless deserts and open grasslands. Distribution in NSW is nearly continuous from the coast to the far west. Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland.	Potential – utilisable habitat and subject land within known and predicted geographic distribution. Not observed during field surveys.	Yes	No (not EPBC Act listed)
<i>Falco hypoleucos</i>	Grey Falcon	V	V	Yes (2)	No	Sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. Subject land is not within the known or predicted geographic region for the species. 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.	Unlikely – Outside BioNet geographic distribution area and sub-optimal habitat in the subject land.	N/A	No
<i>Falco subniger</i>	Black Falcon	–	V	Yes (25)	Yes (14)	Widely, but sparsely, distributed in New South Wales, mostly occurring in inland regions. Inhabits woodland, shrubland and grassland in the arid and semi-arid zones, especially wooded watercourses and agricultural land with scattered remnant trees. Usually associated with streams or wetlands, visiting them in search of prey and often using standing dead trees as lookout posts.	Potential – utilisable habitat and subject land within known and predicted geographic distribution. Not observed during field surveys.	Yes	No (not EPBC Act listed)
<i>Gallinago hardwickii</i>	Latham's Snipe	V	–	Yes (32)	Yes (17)	Non-breeding visitor to south-eastern Australia and is a passage migrant through northern Australia. Occurs in permanent and ephemeral wetlands up to 2000 m above sea-level, usually inhabiting open, freshwater wetlands with low, dense vegetation. However, they can also	No – habitat within the subject land and vicinity is unsuitable.	N/A	No

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						occur in habitats with saline or brackish water, in modified or artificial habitats, and in habitats located close to humans or human activity			
<i>Glossopsitta pusilla</i>	Little Lorikeet	–	V	Yes (64)	Yes (4)	In NSW, distributed in forests and woodlands from the coast to the western slopes of the Great Dividing Range, extending westwards to the vicinity of Albury, Parkes, Dubbo and Narrabri. Mostly occur in dry, open eucalypt forests and woodlands. They have been recorded from both old-growth and logged forests in the eastern part of their range, and in remnant woodland patches and roadside vegetation on the western slopes.	Potential – utilisable habitat and subject land within known and predicted geographic distribution. Not observed during field surveys.	No	No (not EPBC Act listed)
<i>Grantiella picta</i>	Painted Honeyeater	V	V	No	No	Nomadic and occurs at low densities throughout its range. The greatest concentrations and almost all breeding occurs on the inland slopes of the Great Dividing Range in NSW, Victoria, and southern Queensland. Inhabits Weeping Myall, Brigalow (<i>Acacia 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> .	Unlikely – Habitat within the subject land is degraded, sub-optimal and lacking mistletoes of the genus <i>Amyema</i> .	Yes	Yes
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	–	V	Yes (9)	No	Distributed around the Australian coastline, including Tasmania, and well inland along rivers and wetlands of the Murray Darling Basin. In NSW it is widespread along the east coast, and along all major inland rivers and waterways. Habitats are characterised by the presence of large areas of open water including larger rivers, swamps, lakes, and the sea. Terrestrial habitats include coastal dunes, tidal flats,	Unlikely – Habitat within the subject land is degraded and sub-optimal.	N/A	No

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						grassland, heathland, woodland, and forest (including rainforest).			
<i>Haliaeetus morphnoides</i>	Little Eagle	–	V	Yes (77)	Yes (37)	Found throughout the Australian mainland excepting the most densely forested parts of the Dividing Range escarpment. Occupies open eucalypt forest, woodland or open woodland. Sheoak or Acacia woodlands and riparian woodlands of interior NSW are also used. Nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter.	Potential – utilisable habitat and subject land within known and predicted geographic distribution. Not observed during field surveys.	Yes	No (not EPBC Act listed)
<i>Hirundapus caudacutus</i>	White-throated Needletail	V	V	Yes (9)	Yes (4)	Widespread in eastern and south-eastern Australia. In eastern Australia, it is recorded in all coastal regions of Queensland and NSW, extending inland to the western slopes of the Great Divide and occasionally onto the adjacent inland plains. Almost exclusively aerial species that forages for insects up to 1 km above ground, usually in large flocks. It forages above terrestrial habitats where insects are more abundant, such as forests, woodlands, mudflats and waterways. Only occurs in Australia between late spring and early autumn, breeds in north Asia.	Potential – utilisable habitat within and in surrounding local area for the species to forage above. Within the species known geographic distribution.	Yes	Yes
<i>Lathamus discolor</i>	Swift Parrot	CE	E	Yes (21)	Yes (14)	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. Not mapped on Important Area Map. On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant	Potential – utilisable habitat and subject land within known and predicted geographic distribution. Not observed during field surveys.	Yes	Yes

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						lerp (from sap-sucking bugs) infestations.			
<i>Leipoa ocellata</i>	Malleefowl	V	E	Yes (5)	No	The stronghold for this species in NSW is the mallee in the south west centred on Mallee Cliffs NP and extending east to near Balranald and scattered records as far north as Mungo NP. Predominantly inhabit mallee communities, preferring the tall, dense and floristically-rich mallee found in higher rainfall (300 - 450 mm mean annual rainfall) areas. Utilises mallee with a spinifex understorey, but usually at lower densities than in areas with a shrub understorey. Less frequently found in other eucalypt woodlands, such as Inland Grey Box, Ironbark or Bimble Box Woodlands with thick understorey, or in other woodlands such dominated by Mulga or native Cypress Pine species. Prefers areas of light sandy to sandy loam soils and habitats with a dense but discontinuous canopy and dense and diverse shrub and herb layers.	Unlikely – Habitat within the subject land is degraded and sub-optimal.	N/A	No
<i>Lophochroa leadbeateri leadbeateri</i>	Pink Cockatoo	E	V	Yes (3)	Yes (1)	Found across the arid and semi-arid inland. In NSW it is found regularly as far east as about Bourke and Griffith, and sporadically further east than that. Inhabits a wide range of treed and treeless inland habitats, always within easy reach of water.	Potential – utilisable habitat and subject land within known and predicted geographic distribution. Not observed during field surveys.	Yes	Yes
<i>Lophoictinia isura</i>	Square-tailed Kite	–	V	Yes (6)	No	In NSW, scattered records of the species throughout the state indicate that the species is a regular resident in the north, north-east and along the major west-flowing river systems. It is a summer breeding migrant to the south-east, including the NSW south coast, arriving in September and leaving by March.	Potential – utilisable habitat and subject land within known and predicted geographic distribution. Not observed during field surveys.	Yes	No (not EPBC Act listed)

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						Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses.			
<i>Melanodryas cucullata cucullata</i>	South-eastern Hooded Robin	E	E	Yes (34)	Yes (7)	Widespread, found across Australia, except for the driest deserts and the wetter coastal areas. Prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas. Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs, and a ground layer of moderately tall native grasses.	Potential – utilisable habitat and subject land within known and predicted geographic distribution. Not observed during field surveys.	Yes	Yes
<i>Melithreptus gularis gularis</i>	Black-chinned Honeyeater	–	V	No	Yes (5)	In NSW it is widespread, with records from the tablelands and western slopes of the Great Dividing Range to the north-west and central-west plains and the Riverina. It is rarely recorded east of the Great Dividing Range, although regularly observed from the Richmond and Clarence River areas. It has also been recorded at a few scattered sites in the Hunter, Central Coast and Illawarra regions, though it is very rare in the latter. Occupies mostly upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts, especially Mugga Ironbark (<i>Eucalyptus sideroxylon</i>), White Box Inland Grey Box, Yellow Box, Blakely's Red Gum, and Forest Red Gum (<i>E. tereticornis</i>). Also inhabits open forests of smooth-barked gums, Stringybarks, Ironbarks, River Sheoaks (nesting habitat) and Tea-trees.	Potential – utilisable habitat and subject land within known and predicted geographic distribution. Not observed during field surveys.	No	No (not EPBC Act listed)
<i>Neophema chrysostoma</i>	Blue-winged Parrot	V	V	No	No	Breed on mainland Australia south of the Great Dividing Range in southern Victoria from Port Albert in Gippsland west to Nelson, and sometimes in the	Unlikely – Outside BioNet geographic distribution area and sub-optimal	N/A	No

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						<p>far south-east of South Australia, and as a partial migrant, also within the north-western, central, and eastern parts of Tasmania. Potential habitat occurs across much of southeast Australia including South Queensland, NSW, South Australia, and Victoria.</p> <p>Inhabit a range of habitats from coastal, sub-coastal and inland areas, through to semi-arid zones. They tend to favour grasslands and grassy woodlands and are often found near wetlands both near the coast and in semi-arid zones. Can also occur in modified environments such as paddocks, golf courses etc. feeding on a range of native and exotic grasses, forbs, and shrubs.</p>	habitat in the subject land.		
<i>Neophema pulchella</i>	Turquoise Parrot	–	V	Yes (5)	Yes (5)	<p>The Turquoise Parrot's range extends from southern Queensland through to northern Victoria, from the coastal plains to the western slopes of the Great Dividing Range.</p> <p>Lives on the edges of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland.</p>	Potential – suitable habitat available within subject land and within known geographic distribution for the species. Not observed during field survey.	Yes	No (not EPBC Act listed)
<i>Ninox connivens</i>	Barking Owl	–	V	Yes (10)	Yes (5)	<p>Found throughout continental Australia except for the central arid regions. Although still common in parts of northern Australia, the species has declined greatly in southern Australia and now occurs in a wide but sparse distribution in NSW.</p> <p>Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. It is flexible in its habitat use, and hunting can extend in to closed forest and more open areas. Sometimes able to successfully breed along timbered watercourses in heavily cleared habitats (e.g. western</p>	Potential – utilisable habitat and subject land within known and predicted geographic distribution. Not observed during field surveys	Yes	No (not EPBC Act listed)

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						NSW) due to the higher density of prey found on these fertile riparian soils.			
<i>Oxyura australis</i>	Blue-billed Duck	–	V	Yes (8)	No	Endemic to south-eastern and south-western Australia. Widespread in NSW, but most common in the southern Murray-Darling Basin area. Prefers deep water in large permanent wetlands and swamps with dense aquatic vegetation. Completely aquatic, swimming low in the water along the edge of dense cover.	Unlikely – Habitat within the subject land is degraded and sub-optimal.	N/A	No
<i>Pachycephala inornata</i>	Gilbert's Whistler	–	V	Yes (7)	Yes (5)	Sparsely distributed over much of the arid and semi-arid zone of inland southern Australia, from the western slopes of NSW to the Western Australian wheatbelt. Occurs in a range of habitats within NSW, though the shared feature appears to be a dense shrub layer. It is widely recorded in mallee shrublands, but also occurs in box-ironbark woodlands, Cypress Pine and Belah woodlands and River Red Gum forests, though at this stage it is only known to use this habitat along the Murray, Edwards and Wakool Rivers. Within the mallee the species is often found in association with an understorey of spinifex and low shrubs including wattles, hakeas, sennas and hop-bushes. In woodland habitats, the understorey comprises dense patches of shrubs, particularly thickets of regrowth Cypress Pine. Parasitic 'cherries' (<i>Exocarpus</i> species) appear to be an important habitat component in Belah and Red Gum communities, though in the latter case other dense shrubs, such as Lignum and wattles, are also utilised.	Potential – utilisable habitat and subject land within known and predicted geographic distribution. Not observed during field surveys.	Yes	No (not EPBC Act listed)
<i>Pedionomus torquatus</i>	Plains-wanderer	CE	E	No	No	Plains-wanderers are distributed across north-central Victoria, southern	Unlikely – Habitat within the subject land is	N/A	No

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						<p>New South Wales (NSW) around the Riverina region, eastern South Australia and west-central Queensland. The species was historically recorded in south-east South Australia, eastern NSW and south-east Queensland, however they are possibly no longer extant in these locations</p> <p>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.</p>	degraded and sub-optimal.		
<i>Petroica boodang</i>	Scarlet Robin	–	V	Yes (60)	Yes (12)	<p>Found in south-eastern Australia (extreme south-east Queensland to Tasmania, western Victoria and south-east South Australia) and south-west Western Australia. In NSW it occupies open forests and woodlands from the coast to the inland slopes.</p> <p>Breeds in drier eucalypt forests and temperate woodlands, often on ridges and slopes, within an open understorey of shrubs and grasses and sometimes in open areas. Abundant logs and coarse woody debris are important structural components of its habitat. In autumn and winter, it migrates to more open habitats such as grassy open woodland or paddocks with scattered trees.</p>	Potential – utilisable habitat and subject land within known and predicted geographic distribution. Not observed during field surveys,	Yes	No (not EPBC Act listed)
<i>Petroica phoenicea</i>	Flame Robin	–	V	Yes (68)	Yes (118)	<p>Endemic to south eastern Australia, and ranges from near the Queensland border to south east South Australia and also in Tasmania. In NSW, it breeds in upland areas and in winter, many birds move to the inland slopes and plains.</p> <p>Breeds in upland tall moist eucalypt forests and woodlands, often on ridges</p>	Potential – utilisable habitat and subject land within known and predicted geographic distribution. Not observed during field surveys.	Yes	No (not EPBC Act listed)

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						and slopes. Prefers clearings or areas with open understoreys. The groundlayer of the breeding habitat is dominated by native grasses and the shrub layer may be either sparse or dense. Occasionally occurs in temperate rainforest, and also in herfields, heathlands, shrublands and sedgelands at high altitudes. In winter, birds migrate to drier more open habitats in the lowlands			
<i>Polytelis swainsonii</i>	Superb Parrot	V	V	Yes (449)	Yes (80)	Found throughout eastern inland NSW. On the South-western Slopes their core breeding area is roughly bounded by Cowra and Yass in the east, and Grenfell, Cootamundra, and Coolac in the west. Inhabit Box-Gum, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest. Nest in the hollows of large trees (dead or alive). May forage up to 10 km from nesting sites, primarily in grassy box woodland.	Present – The species was observed within subject land of original BDAR for the Gregadoo Solar Farm (NGH, 2018). Observation is just to the west of modification four subject land.	Yes	Yes
<i>Pomatostomus temporalis temporalis</i>	Grey-crowned Babbler	–	V	No	Yes (2)	In NSW, the eastern sub-species occurs on the western slopes of the Great Dividing Range, and on the western plains reaching as far as Louth and Balranald. It also occurs in woodlands in the Hunter Valley and in several locations on the north coast of NSW. It may be extinct in the southern, central and New England tablelands. Inhabits open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains. Woodlands on fertile soils in coastal regions.	Potential- The area has some low-quality habitat that this species may utilise on occasion.	Yes	No (not EPBC Act listed)
<i>Pyrholaemus sagittatus</i>	Speckled Warbler	–	V	Yes (68)	Yes (6)	Has a patchy distribution throughout the eastern half of NSW, most frequently reported from the hills and tablelands of the Great Dividing Range, and rarely from the coast.	Potential – utilisable habitat and subject land within known and predicted geographic	Yes	No (not EPBC Act listed)

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						Lives in a wide range of Eucalyptus dominated communities that have a grassy understorey, often on rocky ridges or in gullies. Typical habitat would include scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy. Large, relatively undisturbed remnants are required for the species to persist in an area.	distribution. Not observed during field surveys.		
<i>Rostratula australis</i>	Australian Painted Snipe	E	E	Yes (1)	No	<p>Restricted to Australia with most records from the south east, particularly the Murray Darling Basin, with scattered records across northern Australia and historical records from around the Perth region in Western Australia.</p> <p>Prefers fringes of swamps, dams, and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. Forages nocturnally on mud-flats and in shallow water. Feeds on worms, molluscs, insects, and some plant-matter.</p>	Unlikely – wetland habitat within subject land (artificial dam) is sub-optimal.	N/A	No
<i>Stagonopleura guttata</i>	Diamond Firetail	V	V	Yes (52)	Yes (10)	<p>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 Northern, Central and Southern Tablelands, the Northern, Central and South Western Slopes and the North West Plains and Riverina</p> <p>Distinctive ground-feeding bird found in grasslands and grassy eucalyptus woodlands, riparian areas, and sometimes lightly wooded farmland. Has been recorded in some towns and near farmhouses.</p>	Potential – utilisable habitat and subject land within known and predicted geographic distribution. Not observed during field surveys	Yes	Yes
<i>Stictonetta naevosa</i>	Freckled Duck	–	V	Yes (11)	Yes (1)	Found primarily in south-eastern and south-western Australia, occurring as a vagrant elsewhere. Breeds in large	Unlikely – wetland habitat within subject	N/A	No

Scientific name	Common name	EPBC Act Status (Cwlth)	BC Act Status (NSW)	ALA records	BioNet records	Distribution and Habitat	Likelihood of Occurrence	Habitat directly or indirectly impacted	EPBC Act Impact assessment required
						<p>temporary swamps created by floods in the Bulloo and Lake Eyre basins and the Murray-Darling system, particularly along the Paroo and Lachlan Rivers, and other rivers within the Riverina.</p> <p>Prefer permanent freshwater swamps and creeks with heavy growth of Cumbungi, Lignum or Tea-tree. During drier times they move from ephemeral breeding swamps to more permanent waters such as lakes, reservoirs, farm dams and sewage ponds.</p>	land (artificial dam) is sub-optimal.		
<i>Tringa nebularia</i>	Common Greenshank	E	–	Yes (5)	Yes (4)	<p>Recorded in most coastal regions. It is widespread west of the Great Dividing Range, especially between the Lachlan and Murray Rivers and the Darling River drainage basin, including the Macquarie Marshes, and north-west regions.</p> <p>Found in a wide variety of inland wetlands and sheltered coastal habitats of varying salinity. It occurs in sheltered coastal habitats, typically with large mudflats and saltmarsh, mangroves or seagrass. The species uses both permanent and ephemeral terrestrial wetlands, including swamps, lakes, dams, rivers, creeks, billabongs, waterholes and inundated floodplains, claypans and saltflats. It will also use artificial wetlands, including sewage farms and saltworks dams, inundated rice crops and bores. The edges of the wetlands used are generally of mud or clay, occasionally of sand, and may be bare or with emergent or fringing vegetation, including short sedges and saltmarsh, mangroves, thickets of rushes, and dead or live trees.</p>	Unlikely – wetland habitat within subject land (artificial dam) is sub-optimal.	N/A	No

Scientific name	Common name	EPBC Act Status (Cwlth)	BC Act Status (NSW)	ALA records	BioNet records	Distribution and Habitat	Likelihood of Occurrence	Habitat directly or indirectly impacted	EPBC Act Impact assessment required
<i>Tyto novaehollandiae</i>	Masked Owl	–	V	Yes (1)	Yes (1)	<p>Extends from the coast where it is most abundant to the western plains. Overall records for this species fall within approximately 90% of NSW, excluding the most arid north-western corner.</p> <p>Lives in dry eucalypt forests and woodlands from sea level to 1100 m. A forest owl, but often hunts along the edges of forests, including roadsides.</p>	Potential – utilisable habitat and subject land within known and predicted geographic distribution. Not observed during field surveys.	Yes	No (not EPBC Act listed)
<i>Tyto tenebricosa</i>	Sooty Owl	–	V	Yes (1)	No	<p>Occupies the easternmost one-eighth of NSW, occurring on the coast, coastal escarpment, and eastern tablelands. Territories are occupied permanently.</p> <p>Occurs in rainforest, including dry rainforest, subtropical and warm temperate rainforest, as well as moist eucalypt forests. Roosts by day in the hollow of a tall forest tree or in heavy vegetation; hunts by night for small ground mammals or tree-dwelling mammals.</p>	Unlikely– utilisable hollow bearing trees within subject land, however, sub-optimal habitat and outside of known geographic distribution. Not observed during field surveys.	N/A	No
Fish									
<i>Bidyanus bidyanus</i>	Silver Perch	CE	V (FM Act)	No	No	<p>Once widespread and abundant throughout most of the Murray-Darling River system. Only one remaining secure and self-sustaining population occurs in NSW in the central Murray River downstream of Yarrowonga weir, as well as several anabranches and tributaries.</p> <p>Found in a wide range of habitats and climates across the Murray-Darling Basin. They are generally found in faster-flowing water including rapids and races and more open sections of river. Spawning and recruitment success are both considered to be heavily dependent on high flows and overbank flooding.</p>	Unlikely – waterways within subject land are unsuitable.	N/A	No

Scientific name	Common name	EPBC Act Status (Cwlth)	BC Act Status (NSW)	ALA records	BioNet records	Distribution and Habitat	Likelihood of Occurrence	Habitat directly or indirectly impacted	EPBC Act Impact assessment required
<i>Galaxius rostratus</i>	Flathead Galaxius	CE	CE (FM Act)	No	No	Known from the southern part of the Murray Darling Basin. They have been recorded in the Macquarie, Lachlan, Murrumbidgee and Murray Rivers in NSW. Now only known from the upper Murray River near Tintaldra and wetland areas near Howlong. Found in still or slow-moving water bodies such as wetlands and lowland streams. Associated with a range of habitats including rock and sandy bottoms and aquatic vegetation.	Unlikely – waterways within subject land are unsuitable.	N/A	No
<i>Maccullochella macquariensis</i>	Trout Cod	E	E (FM Act)	No	No	Endemic to the southern Murray-Darling River system, including the Murrumbidgee and Murray Rivers, and the Macquarie River in central NSW. Found in faster flowing water with rocky and gravel bottoms, but can also be found in some slower flowing, lowland rivers. Large woody snags are very important as they provide complex habitats for each stage of the species' life cycle.	Unlikely – waterways within subject land are unsuitable.	N/A	No
<i>Maccullochella peelii</i>	Murray Cod	V	–	No	No	Once abundant throughout the Murray-Darling River system, but overfishing and environmental changes have drastically reduced its numbers. Generally, prefer slow flowing, turbid water in streams and rivers, favouring deeper water around boulders, undercut banks, overhanging vegetation and logs.	Unlikely – waterways within subject land are unsuitable.	N/A	No
<i>Macquaria australasica</i>	Macquarie Perch	E	E (FM Act)	No	No	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.	Unlikely – waterways within subject land are unsuitable.	N/A	No

Scientific name	Common name	EPBC Act Status (Cwlth)	BC Act Status (NSW)	ALA records	BioNet records	Distribution and Habitat	Likelihood of Occurrence	Habitat directly or indirectly impacted	EPBC Act Impact assessment required
						Occurs in waters with lots of cover such as aquatic vegetation, snags, boulders, and overhanging banks.			
Frog									
<i>Crinia sloanei</i>	Sloane's Froglet	E	E	Yes (4)	No	Recorded from widely scattered sites in the floodplains of the Murray-Darling Basin with the majority of records occurring in the Darling Riverine Plains, NSW South Western Slopes and Riverina bioregions. Typically associated with periodically inundated areas in grassland, woodland and disturbed habitats.	Unlikely – potential habitat (ephemeral drainage line) is available within the subject land; however targeted surveys did not detect this species	N/A	No
<i>Litoria booroolongensis</i>	Booroolong Frog	E	E	No	No	Restricted to NSW and north-eastern Victoria, predominantly along the western-flowing streams of the Great Dividing Range. Lives along permanent streams with some fringing vegetation cover such as ferns, sedges or grasses. Shelters under rocks or amongst vegetation near the ground on the stream edge.	Unlikely – habitat within the subject land is unsuitable	N/A	No
<i>Litoria raniformis</i>	Southern Bell Frog	V	E	Yes (15)	Yes (1)	Once distributed in NSW along the Murray and Murrumbidgee Rivers and their tributaries, the southern slopes of the Monaro district and the central southern tablelands as far north as Tarana, near Bathurst. Currently known to exist in isolated populations in the Coleambally Irrigation Area, the Lowbidgee floodplain and around Lake Victoria. 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.	Unlikely – habitat within the subject land is unsuitable	N/A	No

Scientific name	Common name	EPBC Act Status (Cwlth)	BC Act Status (NSW)	ALA records	BioNet records	Distribution and Habitat	Likelihood of Occurrence	Habitat directly or indirectly impacted	EPBC Act Impact assessment required
Invertebrates									
<i>Keyacris scurra</i>	Key's Matchstick Grasshopper	E	E	No	No	Historically distributed from Victoria to Orange (NSW) across the wheat/sheep belt. Usually found in native grasslands but it has also been recorded in other vegetation associations containing a native grass understory. Associated with Kangaroo grass and known to feed on Asteraceae species	Potential – utilisable habitat and subject land within and at the edge of the species predicted geographical range. Not observed during field surveys.	Yes	Yes
<i>Synemon plana</i>	Golden Sun Moth	V	V	No	No	NSW populations are found in the area between Queanbeyan, Gunning, Young and Tumut. The species' historical distribution extended from Bathurst (central NSW) through the NSW Southern Tablelands, through to central and western Victoria, to Bordertown in eastern South Australia. Occurs in Natural Temperate Grasslands and grassy Box-Gum Woodlands in which groundlayer is dominated by Wallaby grass (<i>Rytidosperma</i> spp). Grasslands dominated by wallaby grasses are typically low and open - the bare ground between the tussocks is thought to be an important microhabitat feature. Habitat may contain several wallaby grass species, which are typically associated with other grasses particularly Spear-grasses or Kangaroo Grass.	Potential – utilisable habitat and subject land within and at the edge of the species predicted geographical range. Not observed during field surveys.	Yes	Yes
Mammals									
<i>Cercartetus nanus</i>	Eastern Pygmy-possum	–	V	No	No	In NSW it extends from the coast inland as far as the Pilliga, Dubbo, Parkes and Wagga Wagga on the western slopes. Found in a broad range of habitats from rainforest through sclerophyll (including Box-Ironbark) forest and woodland to heath, but in most areas	Unlikely – no records within 10 km and habitat within subject land is degraded and suboptimal.	N/A	No

Scientific name	Common name	EPBC Act Status (Cwlth)	BC Act Status (NSW)	ALA records	BioNet records	Distribution and Habitat	Likelihood of Occurrence	Habitat directly or indirectly impacted	EPBC Act Impact assessment required
						woodlands and heath appear to be preferred, except in north-eastern NSW where they are most frequently encountered in rainforest. They may occupy small patches of vegetation in fragmented landscapes and although the species prefers habitat with a rich shrub understory, they are known to occur in grassy woodlands and the presence of eucalypts alone is sufficient to support populations in low densities. Feeds largely on nectar and pollen collected from banksias, eucalypts and bottlebrushes; an important pollinator of heathland plants such as banksias; soft fruits are eaten when flowers are unavailable.			
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	E	V	No	No	<p>Generally rare with a patch distribution in NSW, found mainly in areas with extensive cliffs and caves from Rockhampton in Queensland south to Bungonia in the NSW Southern Highlands.</p> <p>Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (<i>Petrochelidon ariel</i>), frequenting low to mid-elevation dry open forest and woodland close to these features. Maternity roosts include roof domes in caves, overhangs, mine adits and concrete structures. Found in well-timbered areas containing gullies.</p>	Unlikely – no roosting habitat (caves or manmade structures) available within subject land.	N/A	No
<i>Chalinolobus picatus</i>	Little Pied Bat	–	V	No	No	<p>Found in inland Queensland and NSW (including Western Plains and slopes) extending slightly into South Australia and Victoria.</p> <p>Occurs in dry open forest, open woodland, Mulga woodlands, chenopod shrublands, Cypress Pine Forest and mallee and Bimbil box woodlands. Roosts in caves, rock</p>	Unlikely – Habitat within the subject land is degraded and sub-optimal.	N/A	No

Scientific name	Common name	EPBC Act Status (Cwlth)	BC Act Status (NSW)	ALA records	BioNet records	Distribution and Habitat	Likelihood of Occurrence	Habitat directly or indirectly impacted	EPBC Act Impact assessment required
						outcrops, mine shafts, tunnels, tree hollows and buildings. Can tolerate high temperatures and dryness but need access to nearby open water.			
<i>Dasyurus maculatus maculatus</i> (SE mainland population)	Spotted-tailed Quoll	E	V	Yes (2)	Yes (1)	<p>Range has contracted considerably since European settlement. It is now found in eastern NSW, eastern Victoria, south-east and north-eastern Queensland, and Tasmania. Only in Tasmania is it still considered relatively common.</p> <p>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 rock outcrops as den sites (DELWP 2016).</p>	Potential – potential habitat within subject land with wider connectivity to forest and woodland along waterways. Known records of the species within 10 km of the subject land.	Yes	Yes
<i>Miniopterus orianae oceanensis</i>	Large Bent-winged Bat	–	V	No	Yes (1)	<p>Occurs along the east and north-west coasts of Australia.</p> <p>Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures. Hunt in forested areas, catching moths and other flying insects above the tree tops.</p>	Potential –available foraging habitat within subject land for the species.	Yes	No (not EPBC Act listed)
<i>Myotis macropus</i>	Southern Myotis	–	V	Yes (2)	Yes (1)	<p>The Southern Myotis is found in the coastal band from the north-west of Australia, across the top-end and south to western Victoria. It is rarely found more than 100 km inland, except along major rivers.</p> <p>Generally, roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, wharves, bridges and in dense foliage. Forage over streams and pools catching insects and small fish by raking their feet across the water surface.</p>	Unlikely – sub-optimal roosting or foraging habitat within subject land.	N/A	No

Scientific name	Common name	EPBC Act Status (Cwlth)	BC Act Status (NSW)	ALA records	BioNet records	Distribution and Habitat	Likelihood of Occurrence	Habitat directly or indirectly impacted	EPBC Act Impact assessment required
<i>Petaurus norfolcensis</i>	Squirrel Glider	–	V	Yes (202)	Yes (152)	Widely though sparsely distributed in eastern Australia, from northern Queensland to western Victoria. Inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum Forest west of the Great Dividing Range and Blackbutt-Bloodwood Forest with heath understorey in coastal areas. Prefers mixed species stands with a shrub or Acacia midstory.	Potential- habitat within the subject land is provides potential breeding and foraging habitat for the species.	Yes	No (not EPBC Act listed)
<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby	V	E	No	No	The distribution of the species across its original range has declined significantly in the west and south and has become more fragmented. In NSW they occur from the Queensland border in the north to the Shoalhaven in the south, with the population in the Warrumbungle Ranges being the western limit. Occupy rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges, often facing north.	Unlikely – no rocky habitat available within subject land.	N/A	No
<i>Nyctophilus corbeni</i>	Corben's Long-eared Bat	V	V	No	No	The distribution 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, Bullock and Box-gum 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.	Unlikely – sub-optimal roosting or foraging habitat within subject land.	N/A	No
<i>Phascogale tapoatafa</i>	Brush-tailed Phascogale	–	V	No	No	Has a patchy distribution around the coast of Australia. In NSW, mainly found east of the Great Dividing Range	Potential- habitat within the subject land is provides potential	Yes	No (not EPBC Act listed)

Scientific name	Common name	EPBC Act Status (Cwlth)	BC Act Status (NSW)	ALA records	BioNet records	Distribution and Habitat	Likelihood of Occurrence	Habitat directly or indirectly impacted	EPBC Act Impact assessment required
						<p>although there are occasional records west of the divide.</p> <p>Prefer dry sclerophyll open forest with sparse groundcover of herbs, grasses, shrubs or leaf litter. Also inhabit heath, swamps, rainforest and wet sclerophyll forest. Agile climber foraging preferentially in rough barked trees of 25 cm DBH or greater.</p>	breeding and foraging habitat for the species.		
<i>Phascolarctos cinereus</i>	Koala	E	E	Yes (7)	Yes (7)	<p>Fragmented distribution throughout eastern Australia from north-east Queensland to the Eyre Peninsula in SA. In NSW, Koala populations are found on the central and north coasts, southern highlands, southern and northern Tablelands, Blue Mountains, southern coastal forests, with some smaller populations on the plains west of the Great Dividing Range.</p> <p>Inhabits eucalypt woodlands and forests. Feeds on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species.</p>	Potential – Potential foraging and dispersal habitat present within the subject land.	Yes	Yes
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V	V	Yes (108)	Yes (100)	<p>Generally found within 200 km of the eastern coast of Australia, from Rockhampton in Queensland to Adelaide in South Australia.</p> <p>Roosts communally in large camps often located in a gully close to water under dense canopy cover. May travel 20–50 km when foraging for foods, giving a home range of ~785,000 ha. Favourite food plants include flowering native trees (<i>Eucalyptus</i>, <i>Melaleuca</i> and <i>Banksia</i> spp.), fruiting rainforest trees and vines, urban gardens, and cultivated fruit crops.</p>	Potential – Potential foraging habitat present. No breeding observed or camps identified.	Yes	Yes
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tail-bat	–	V	Yes (1)	Yes (1)	Found across northern and eastern Australia. In the most southerly part of its range - most of Victoria, south-western NSW and adjacent South	Likely – The species was recorded with a 'possible' certainty within subject land of original BDAR for	Yes	No (not EPBC Act listed)

Scientific name	Common name	EPBC Act Status (Cwlth)	BC Act Status (NSW)	ALA records	BioNet records	Distribution and Habitat	Likelihood of Occurrence	Habitat directly or indirectly impacted	EPBC Act Impact assessment required
						<p>Australia - it is a rare visitor in late summer and autumn. There are scattered records across the New England Tablelands and North West Slopes.</p> <p>Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. When foraging for insects, flies high and fast over the forest canopy, but lower in more open country. Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory.</p>	<p>the Gregadoo Solar Farm (NGH, 2018). Observation is within modification four subject land.</p> <p>Subject land has suitable roosting and foraging habitat for the species.</p>		
Reptile									
<i>Aprasia parapulchella</i>	Pink-tailed Worm-lizard	V	V	No	No	<p>Only known from the Central and Southern Tablelands, and the South Western Slopes. There is a concentration of populations in the Canberra/Queanbeyan Region. Other populations have been recorded near Cooma, Yass, Bathurst, Albury, and West Wyalong</p> <p>Inhabits sloping, open woodland areas with predominantly native grassy ground layers, particularly those dominated by Kangaroo Grass. Sites are typically well-drained, with rocky outcrops or scattered, partially-buried rocks.</p>	No – no rocky habitat available within subject land.	N/A	No
<i>Delma impar</i>	Striped Legless Lizard	V	V	No	No	<p>Occurs in the Southern Tablelands, the South West Slopes, the Upper Hunter and possibly on the Riverina. Populations are known in the Goulburn, Yass, Queanbeyan, Cooma, Muswellbrook and Tumut areas.</p> <p>Found in grassland dominated by perennial, tussock-forming grasses. Native grasslands such as Natural Temperate Grassland as well as secondary grassland near Natural</p>	Unlikely – habitat within subject land is degraded and sub-optimal.	N/A	No

Scientific name	Common name	EPBC Act Status (Cwlth)	BC Act Status (NSW)	ALA records	BioNet records	Distribution and Habitat	Likelihood of Occurrence	Habitat directly or indirectly impacted	EPBC Act Impact assessment required
						Temperate Grassland and occasionally in open Box-Gum Woodland are preferred, however has been found in modified grasslands with significant exotic grasses. Surface rocks are used for shelter.			
<i>Varanus rosenbergi</i>	Rosenberg's Goanna	–	V	No	No	Occurs on the Sydney Sandstone in Wollemi National Park to the north-west of Sydney, in the Goulburn and ACT regions and near Cooma in the south. There are records from the South West Slopes near Khancoban and Tooma River. Found in heath, open forest and woodland. Associated with termites, the mounds of which this species nests in; termite mounds are a critical habitat component. Individuals require large areas of habitat. Shelters in hollow logs, rock crevices and in burrows self-dug or other species' such as rabbits)	Potential – potential suitable habitat available	Yes	No (Not EPBC Act listed)

TABLE C 3: LIKELIHOOD OF OCCURRENCE OF EPBC LISTED MIGRATORY SPECIES

Scientific name	Common name	EPBC Act Status	ALA records	BioNet records	Distribution and Habitat	Likelihood of Occurrence	Habitat directly or indirectly impacted	Impact assessment required
Marine migratory birds								
<i>Apus pacificus</i>	Fork-tailed Swift	M	No	Yes (5)	<p>Non-breeding visitor to all states and territories of Australia. In NSW, Fork-tailed Swift is recorded in all regions. Many records occur east of the Great Divide; however, a few populations have been found to the west of the Great Divide.</p> <p>Almost exclusively aerial, flying from less than 1 m to at least 300 m above ground and probably much higher. Only lands occasionally where it nests on mountain cliffs and cliff faces, Species may forage above subject land but no suitable habitat within it.</p>	Potential – Species may forage above subject land but no suitable habitat within it.	Yes	Yes
Terrestrial migratory birds								
<i>Hirundapus caudacutus</i>	White-throated Needletail	M (V)	Yes (3)	Yes (2)	<p>Migratory bird, only occurring in eastern Australia between late spring and early autumn. Breeds in north Asia.</p> <p>Almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground.</p>	Potential – utilisable habitat within and in surrounding local area for the species to forage above. Within the species known geographic distribution.	Yes	Yes
<i>Motacilla flava</i>	Yellow Wagtail	M	No	No	<p>Breeds in much of temperate Europe and Asia. Migrates from northern Asia, occurs in coastal Australia from around Exmouth, WA to about Newcastle, NSW, vagrant to the south of these limits.</p> <p>Found in open country near water, such as wet meadows where it feeds on insects and nests in tussocks.</p>	Unlikely – habitat within subject land is degraded and suboptimal.	N/A	No
<i>Myiagra cyanoleuca</i>	Satin Flycatcher	M	No	No	<p>Found along the east coast of Australia from far northern Queensland to Tasmania, including south-eastern South Australia. Breeding known to occur within area.</p> <p>Species inhabits heavily vegetated gullies in eucalypt forests near water and may forage through a diverse range of ecosystems nearby.</p>	Unlikely – habitat within the subject land is not suitable.	N/A	No
Wetland migratory birds								
<i>Actitis hypoleucos</i>	Common Sandpiper	M	No	No	<p>Found along all coastlines of Australia and in many areas inland, the Common Sandpiper is widespread in small numbers. Mainly breeds in parts of Europe and Asia, and occasionally Africa.</p>	Unlikely – wetland habitat within subject land	N/A	No

Scientific name	Common name	EPBC Act Status	ALA records	BioNet records	Distribution and Habitat	Likelihood of Occurrence	Habitat directly or indirectly impacted	Impact assessment required
					Wetland specialist. 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.	(artificial dam) is sub-optimal.		
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	M (V)	No	Yes (20)	Spends the non-breeding season in Australia with small numbers occurring regularly in New Zealand. Most of the population migrates to Australia, mostly to the south-east and are widespread in both inland and coastal locations and in both freshwater and saline habitats. 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, salt pans and hypersaline salt lakes inland.	Unlikely – wetland habitat within subject land (artificial dam) is sub-optimal.	N/A	No
<i>Calidris ferruginea</i>	Curlew Sandpiper	M (CE)	Yes (3)	Yes (3)	Distributed around most of the Australian coastline (including Tasmania). Inland records are probably mainly of birds pausing for a few days during migration. Generally, occupies littoral and estuarine habitats, and in NSW is mainly found in intertidal mudflats of sheltered coasts.	Unlikely – wetland habitat within subject land (artificial dam) is sub-optimal.	N/A	No
<i>Calidris ruficollis</i>	Red-necked Stint	M	No	Yes (5)	Recorded in all coastal regions and found inland in all states when conditions are suitable. Mostly forages on bare wet mud on intertidal mudflats or sandflats, or in very shallow water. Has been recorded foraging in flooded paddocks and in a freshly cropped lucerne paddock near lagoons	Unlikely – wetland habitat within subject land (artificial dam) is sub-optimal.	N/A	No
<i>Calidris melanotos</i>	Pectoral Sandpiper	M	No	No	Widespread, but scattered. Records exist east of the Great Divide, from Casino and Ballina, south to Ulladulla. West of the Great Divide, the species is widespread in the Riverina and Lower Western regions. Prefers shallow fresh to saline wetlands. Found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands.	Unlikely – wetland habitat within subject land (artificial dam) is sub-optimal.	N/A	No
<i>Gallinago hardwickii</i>	Latham's Snipe	M (V)	No	No	Non-breeding visitor to south-eastern Australia and is a passage migrant through northern Australia. The range extends inland over the eastern Tablelands in south-eastern QLD, and to west of the Great Dividing Range in NSW. Occurs in permanent and ephemeral wetlands up to 2000 m above sea-level. They usually inhabit open, freshwater wetlands with low,	Unlikely – wetland habitat within subject land (artificial dam) is sub-optimal.	N/A	No

Scientific name	Common name	EPBC Act Status	ALA records	BioNet records	Distribution and Habitat	Likelihood of Occurrence	Habitat directly or indirectly impacted	Impact assessment required
<i>Tringa stagnatilis</i>	Marsh Sandpiper	M	No	Yes (1)	<p>dense vegetation (e.g., swamps, flooded grasslands or heathlands, around bogs and other water bodies).</p> <p>Found on coastal and inland wetlands throughout Australia. Recorded in all regions of NSW but especially the central and south coasts and (inland) on the western slopes of Great Divide and western plains.</p> <p>Lives in permanent or ephemeral wetlands of varying salinity.</p>	Unlikely – wetland habitat within subject land (artificial dam) is sub-optimal.	N/A	No

Appendix D: Matters of National Environmental Significance

The EPBC Act provides a framework to protect MNES, including Commonwealth-listed threatened species and TECs. Any actions with potential to have a significant impact on MNES are likely to be considered a Controlled Action under the EPBC and require approval from the Minister for the Environment.

Desktop research using the Commonwealth Protected Matters Search Tool (the PMST) on 20 August 2024 for a 10 km buffer identified several MNES with potential to occur within or near the site. The proposals expected impacts are to be assessed in accordance with the Significant Impact Guidelines 1.1. an overview of that assessment is provided in **Table D 1** below.

TABLE D 1: OVERVIEW OF MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

MNES	Potential impacts	More information
World Heritage Properties	None	The subject land does not contain and is not within 10 km of a World Heritage Property. As such, the project is not likely to impact any World Heritage Properties.
National Heritage Places	None	The subject land does not contain and is not within 10 km of a National Heritage Place. As such, the project is not likely to impact any National Heritage Places.
Wetlands of International Importance	None	The subject land does not contain and is not within 10 km of a Wetlands of International Importance. As such, the project is not likely to impact any Wetlands of International Importance.
Nationally threatened ecological communities	None	An EPBC PMST report flags that three TECs listed by the Commonwealth are known or may occur within 10 km of the subject land. No Commonwealth listed TEC was observed to occur within the subject land (see Likelihood of Occurrence below). The proposed development is not likely to significantly impact any Commonwealth listed TEC
Nationally threatened species	Yes	An EPBC PMST report flags that 43 threatened species listed by the Commonwealth are known or may occur within 10 km of the project area. Two additional threatened species with a likelihood of occurring within the subject land were also added manually. A likelihood of occurrence assessment (Appendix C) indicates that 16 of these species are known, likely or have the potential to utilise habitats within the subject land. The following summarises results of the significant impact assessment for the proposed modification (Appendix E). The proposed modification has the potential to have a significant impact on the following species: <ul style="list-style-type: none"> • <i>Euphrasia arguta</i>, • <i>Austrostipa wakoolica</i>, • Key’s Matchstick Grasshopper (<i>Keyacris scurra</i>), • South-eastern Hooded Robin (<i>Melanodryas cucullata cucullata</i>), • Southern Whiteface (<i>Aphelocephala leucopsis</i>), • Diamond Firetail (<i>Stagonopleura guttata</i>), and • Golden Sun Moth (<i>Synemon plana</i>). The proposed modification is unlikely to have a significant impact on the following species: <ul style="list-style-type: none"> • Swift Parrot (<i>Lathamus discolor</i>), • Gang-gang Cockatoo (<i>Callocephalon fimbriatum</i>) • Spotted-tailed Quoll (<i>Dasyurus maculatus maculatus</i> [SE mainland population]), • Pink Cockatoo (<i>Lophochroa leadbeateri leadbeateri</i>), • Koala (<i>Phascolarctos cinereus</i>), • South-eastern Glossy Black-Cockatoo (<i>Calyptorhynchus lathami lathami</i>), • White-throated Needletail (<i>Hirundapus caudacutus</i>), • Superb Parrot (<i>Polytelis swainsonii</i>), and • Grey-headed Flying-fox (<i>Pteropus poliocephalus</i>).

MNES	Potential impacts	More information
Migratory species	Yes	<p>Among the 9 EPBC listed migratory species known or likely to occur within 10 km of the study area, White-throated Needletail (<i>Hirundapus caudacutus</i>) and Fork-tailed Swift (<i>Apus pacificus</i>) were considered likely to utilise the subject land. The proposed modification is not likely to have a significant impact on any listed migratory species as it is not expected to:</p> <ul style="list-style-type: none"> • substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat, • 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 • seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviours) of an ecologically significant proportion of the population of a migratory species.
Commonwealth marine areas	None	None, the subject land is not near and does not drain into any Commonwealth marine area.
Great Barrier Reef Marine Park	None	None, the subject land is not near and does not drain into the Great Barrier Reef Marine Park.
Nuclear actions including uranium mining	None	None, the proposed development does not involve any nuclear actions.
A water resource, in relation to coal seam gas development/ large coal mining development	None	None, the proposed development does not involve water usage for any form of coal development.

Appendix E: Commonwealth Test of Significant Impacts

The likelihood of occurrence assessment in **Appendix C** identified a Test of Significance assessment (see sections below) is to be applied for the following species:

- Critically Endangered:
 - *Euphrasia arguta*, and
 - Swift Parrot (*Lathamus discolor*).
- Endangered:
 - *Austrostipa wakoolica*,
 - Gang-gang Cockatoo (*Callocephalon fimbriatum*)
 - Spotted-tailed Quoll (*Dasyurus maculatus maculatus* [SE mainland population]),
 - Key's Matchstick Grasshopper (*Keyacris scurra*),
 - Pink Cockatoo (*Lophochroa leadbeateri leadbeateri*),
 - South-eastern Hooded Robin (*Melanodryas cucullata cucullata*), and
 - Koala (*Phascolarctos cinereus*).
- Vulnerable:
 - Southern Whiteface (*Aphelocephala leucopsis*),
 - South-eastern Glossy Black-Cockatoo (*Calyptorhynchus lathami lathami*),
 - White-throated Needletail (*Hirundapus caudacutus*),
 - Superb Parrot (*Polytelis swainsonii*),
 - Grey-headed Flying-fox (*Pteropus poliocephalus*)
 - Diamond Firetail (*Stagonopleura guttata*), and
 - Golden Sun Moth (*Synemon plana*).
- Migratory:
 - White-throated Needletail (*Hirundapus caudacutus*), and
 - Fork-tailed Swift (*Apus pacificus*)

E1 Critically endangered and endangered species

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,
- b) reduce the area of occupancy of the species,
- c) fragment an existing population into two or more populations,
- d) adversely affect habitat critical to the survival of a species,
- e) disrupt the breeding cycle of a population,
- f) 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 endangered or critically endangered species' habitat,
- h) introduce disease that may cause the species to decline, or
- i) interfere with the recovery of the species.

E1.1 EUPHRASIA ARGUTA

Euphrasia arguta is an erect, semi-parasitic annual herb that grows to 45 cm tall, which is listed as Critically Endangered under the EPBC Act as of 19 March 2011.

The species is ephemeral and likely to emerge after an increase in light exposure (e.g. post fire, opening of canopy, on edges) and following rain (Commonwealth DCCEEW, 2011). It has a documented flowering period of November – March. Historical information of collections of this species suggests the species could be found in 'open forest country around Bathurst in subhumid places', 'on grassy country near Bathurst' and 'in meadows near rivers' (Barker, W.R. (1987) (Barker, W.R. (1982). However, the species has been rediscovered in habitat types unlike those originally documented. Populations of the species found in 2008 within Nundle State Forest occur in eucalypt forest with a mixed grass and shrub understory, at sites that have either been logged in the last few decades or appear to have regrown from past clearing. The densest patches were recorded to occur in open disturbed areas, such as along roadsides indicating the species may be responding to disturbances. Populations that have been affected with multiple disturbance events near Nundle (two disturbance events in three years) recorded a decline in the number of present individuals, in contrast to sites that were only disturbed once (OEH, 2020a).

Euphrasia arguta has the potential to occur in the subject land due to the availability of some potentially suitable habitat such as areas containing a mixed grassy understory and with a high light availability. However, research on this species response to disturbance currently suggests that habitat within the subject land is overly modified and disturbed given its history of modification through ploughing and cropping, as well as sections of the subject land occurring on road verge being largely managed through slashing and mowing. These modifications of habitat suggest the species is unlikely to thrive within the subject land.

The survey period for this species is between November and March. The majority of the subject land has been surveyed during March for this species. However, sections of the subject land that occur on road verges have not been surveyed, and therefore require surveying during this time period as to ascertain the presence or absence of this species from those areas. In the absence of further targeted surveys, the species has conservatively been assumed present. If this species is present in the subject land, there is potential for the proposed development to have a significant impact.

TABLE E 1: EUPHRASIA ARGUTA EPBC ACT SIGNIFICANT IMPACT ASSESSMENT

Significant impact criteria	Likelihood	Justification
Lead to a long-term decrease in the size of a population	Scientific uncertainty	<p>The Approved Conservation Advice for this species states that it is known from six sites up to 25 km apart in the area of Nundle State Forest, south east of Tamworth. All six of these sites are in the Nandewar Bioregion of northern New South Wales, within the south-east section of Namio NRM region. The largest of these populations contains more than 90% of known individuals.</p> <p>Until targeted surveys are completed across the entirety of the subject land for the species during recognised survey periods, it is unknown as to whether the subject land contains a population. If present, the proposal is likely to lead to a long-term decrease through direct disturbance/removal of habitat and individuals.</p>
Reduce the area of occupancy of the species	Scientific uncertainty	<p>The area of occupancy for <i>Euphrasia arguta</i> has not been defined in any Commonwealth documents. The Distribution Map on the SPRAT profile, however, displays a relatively large area for which the species or species habitat is likely to occur. However, this area occurs north and northwest of Sydney and does not include to area of Wagga Wagga or the subject land. The Approved Conservation Advice suggests that the distribution of these species prior to rediscovery in 2008 was considered to be areas of grassy habitat near rivers at elevations of up to 700 m above sea level, with annual rainfall of 600 mm. Recently discovered populations occur however in grassy forests and regrowth vegetation. Despite the small size of the subject land, some habitat features listed by the Approved Conservation Advice it is currently unclear whether the proposal has the potential to reduce the area of occupancy for this species.</p> <p>Until targeted surveys are completed across the entirety of the subject land for the species during recognised survey periods, it is unknown as to whether the subject land contains a population. If present, the proposal is likely to lead to a reduction in the area of occupancy for this species.</p>
Fragment an existing population into two or more populations	Scientific uncertainty	<p>As noted above, until targeted surveys are undertaken for the species during recognised survey periods, it is unclear as to whether the subject land contains a population of this species. If the species is present within the subject land, the proposal may fragment an existing important population into two or more populations.</p>
Adversely affect habitat critical to the survival of a species	Scientific uncertainty	<p>Habitat critical to the survival of the species is yet to be defined, although could be interpreted by the Conservation Advice as grassy forests or regrowth vegetation within the Nandewar Bioregion. Although the site does not occur in this bioregion and the disturbed nature of the site makes it unlikely to represent 'critical habitat' for the species, the importance of the subject land to species viability is unknown. As noted above, until targeted surveys are completed across the entirety of the subject land for the species during recognised survey periods, it is unclear as to whether the subject land contains a population of this species. If present, there is uncertainty about whether the proposed development would adversely affect habitat critical for the survival of this species.</p>
Disrupt the breeding cycle of a population	Scientific uncertainty	<p>As noted above, until targeted surveys are completed across the entirety of the subject land for the species during recognised survey periods, it is unclear as to whether the subject land contains a population of this species. If determined present within the subject land the removal of 0.5368 ha is likely to disrupt the breeding cycle of a population by direct removal and disturbance of individuals and suitable habitat.</p>
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Scientific uncertainty	<p>The proposed development will require the removal of potentially utilisable habitat by this species within the subject land. Until targeted surveys are completed across the entirety of the subject land for the species during recognised survey periods, it is unknown as to whether the subject land contains the species. If present, the proposal is likely to modify, destroy, remove, and decrease the availability or quality of habitat to the extent that the species is likely to decline.</p>
Result in invasive species that are harmful to a vulnerable species becoming established in the species' habitat	Unlikely	<p>The proposal seeks to alter 0.5368 ha of moderate to largely disturbed land which already contains a variety of weedy species. Provided mitigations measures (outlined in Section Error! Reference source not found.) are f</p>

		allowed, the proposal is not likely to increase the number of invasive species within potential habitat areas.
Introduce disease that may cause the species to decline	Unlikely	There is insufficient information available on diseases impacting <i>Euphrasia arguta</i> ; however, the proposal is considered unlikely to introduce disease that may cause the species to decline.
Interfere with the recovery of the species	Scientific uncertainty	The Approved Conservation Advice suggests that the species is threatened by road maintenance and clearing of roadside vegetation for fire breaks, such that the species geographic distribution is precarious for its survival. As the proposal involves the modification of some habitats that occur in road verges of the subject land, there is potential that if this species is present, the proposal will likely interfere with the recovery of the species. Until targeted surveys are completed across the entirety of the subject land for the species during recognised survey periods, it is unknown as to whether the subject land contains the species and whether the proposal will negatively interfere with the recovery of the species.

E1.2 SWIFT PARROT (*LATHAMUS DISCOLOR*)

Swift Parrot is listed as Critically Endangered under the EPBC Act, effective May of 2016, and is additionally listed as a threatened species in each state and territory in which it occurs, including NSW. Swift Parrots breed in Tasmania and migrate to mainland Australia during autumn, dispersing across mainly Victoria and NSW in winter to forage on nectar and lerps in eucalypt trees. The species is predominantly found in dry forests and woodlands of the box-ironbark region on the inland slopes of the Great Dividing Range. In NSW, Swift Parrots forage in forests and woodlands in both the western slopes region and coastal region each year, with coastal regions supporting larger numbers of birds when inland habitats are subjected to drought (DE, 2024b).

This species was not recorded during field surveys, although these were conducted during the non-breeding season in which most of the population of the Swift Parrot winter within mainland Australia. The subject land is within the predicted geographic distribution for the species and contains Western Grey Box (*E. microcarpa*), which has been identified as a key foraging species for the Swift Parrot (Commonwealth DCCEEW, 2024) and records of this species occur within 10 km of the subject land.

Due to the high fragmentation of NSW Swift Parrot sites, the species can be found opportunistically foraging within a wide range of habitat areas. Targeted surveys may be required to make a more robust determination of the likely use of the study area; however, this species may have a low probability of detection using targeted surveys and, in this case, occurrence cannot be entirely discounted.

Following the Significant Impact Guidelines, the proposed modification is unlikely to have a significant impact on Swift Parrot as detailed in the table below.

TABLE E 2: SWIFT PARROT EPBC ACT SIGNIFICANT IMPACT ASSESSMENT

Significant impact criteria	Likelihood	Justification
Lead to a long-term decrease in the size of a population	Unlikely	Recent population estimates for Swift Parrot suggest 750 mature individuals (300 - 1000) with a declining trend (Garnet & Baker, 2021). Therefore, all impacts on the population could be considered significant impacts on a population. The proposal includes clearing of two sapling Grey Box (<i>Eucalyptus microcarpa</i>) trees which is listed in the Recovery Plan for Swift Parrot as a key foraging species (Commonwealth DCCEEW, 2024). Due to the immaturity of these trees, they do not yet provide foraging habitat to the species. As such, this removal of immature foraging vegetation is unlikely to lead to a long-term decrease in the size of a population.
Reduce the area of occupancy of the species	Unlikely	The area of occupancy for Swift Parrot is estimated to be between 18.5 and 355 km ² , with the winter distribution for the species extending from south-eastern Queensland to eastern NSW and into south-eastern South Australia. For NSW, the western slopes and coastal regions are significant occupancy areas. Due to this, any impact to habitat has the potential to reduce the area of occupancy of this species. The proposal seeks to remove 0.5368 ha of modified grassland and planted vegetation, which includes two regenerating immature Grey Box trees, which unlikely constitutes the removal of key Swift Parrot habitat. As such, the proposal it is considered unlikely to reduce the area of occupancy of Swift Parrot.
Fragment an existing population into two or more populations	Unlikely	The proposal involves the removal of two immature species of key foraging tree, which is considered unlikely to contribute to the fragmentation of habitat this will cause within the local landscape. Furthermore, Swift Parrots are highly mobile and exhibit large seasonal migrations across south-eastern Australia in search of quality foraging habitat. Any potential foraging by Swift Parrot populations in the future would still have access to surrounding habitat. Fragmentation of an existing population into two or more populations is unlikely due to the migratory nature and high dispersal ability of the species.
Adversely affect habitat critical to the survival of a species	Unlikely	The subject land falls within the South-west Slopes of New South Wales, an area considered to be a Key Biodiversity Area for the Swift Parrot. Within this

		<p>area, Swift Parrot relies upon nature reserves and National Parks, as well as remnant woodland scattered throughout the heavily modified region.</p> <p>The proposal seeks to remove two immature Grey Box saplings, a key foraging species for the Swift Parrot. However, given the immaturity of these trees they do not yet provide foraging habitat to the Swift Parrot. It is considered unlikely that the removal of these two immature Grey Box saplings for the proposed development will adversely affect habitat critical to the survival of a species.</p>
Disrupt the breeding cycle of a population	Unlikely	Swift Parrot breeds only in Tasmania, and as such, the proposal is considered unlikely to disrupt the breeding cycle of the population.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Unlikely	Swift Parrot preferentially forages in mature trees with a DBH greater than 60 cm. The proposal does not involve the removal of any mature trees, it does however involve the removal of two immature sapling Grey Box not considered key foraging habitat for the Swift Parrot. As such, it is unlikely that the proposal will modify, destroy, remove, 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 species' habitat	Unlikely	The proposal seeks to alter 0.5368 ha of modified grassland and planted vegetation which already contains a variety of weedy species. Invasive fauna species such as European Fox were recorded during surveys, and as such have already been introduced. Provided mitigation measures (outlined in Section Error! Reference source not found.) are followed, the proposal is not likely to increase the number of invasive species to the subject land.
Introduce disease that may cause the species to decline	Unlikely	Swift Parrots are susceptible to Psittacine beak and feather disease (Pbfd). While Pbfd is known to occur in Swift Parrots in the wild and captive birds, the prevalence and pathogenicity of the disease is currently not known. However, it is unlikely that the proposed development would further introduce this disease to the species population as the disease is transmitted through feather dander, faeces, and saliva, which is unlikely to be introduced in development works.
Interfere with the recovery of the species	Unlikely	Although the subject area falls within a mosaic of remnant woodland, nature reserves, and National Park within a priority area for the species, the removal of any tree upon which the Swift Parrot relies for foraging habitat has the potential to have a negative effect on this species. The proposal seeks to remove two immature sapling key foraging trees, not considered mature enough to be considered optimal foraging habitat for the species. Therefore, the proposal is considered unlikely to contribute to a further decrease in habitat availability for the species, and in turn, is unlikely to interfere with the recovery of the species.

E1.3 A SPEAR-GRASS (*AUSTROSTIPA WAKOOLICA*)

Austrostipa wakoolica is a densely tufted, perennial spear-grass that grows to 1 m tall, which is listed as Endangered under the EPBC Act as of 16 July 2000.

This species flowers in response to rain from October to December (Commonwealth DCCEEW, 2014). The species probably does not tolerate disturbance, and likely requires sites protected from the impacts of herbivore grazing and rabbits. *Austrostipa wakoolica* probably requires periodic flooding of its habitat to maintain wet conditions. It is not known whether fire plays a role in the ecology of this species. Most species of *Austrostipa* provide an abundance of highly flammable ephemeral fuel in periods following above-average rainfall. Seed dispersal is mainly by wind, rain and flood events; the awn and sharp point of the floret appear to be an adaptation for burying the seed into the soil; grass seed is traditionally believed to be viable for three to five years, so a long-lived seed bank is considered unlikely for this species (Commonwealth DCCEEW, 2014).

Austrostipa wakoolica has potential to occur in the subject land due to the availability of suitable habitat and presence of a moderate range of native grasses, including two other Speargrass species - Corkscrew Speargrass (*Austrostipa scabra*) and Tall Speargrass (*Austrostipa bigeniculata*); however, as this species is not tolerant of disturbance, the heavily disturbed nature of the majority of the subject area makes the species unlikely to thrive.

The survey period for this species is between October and December. In the absence of targeted surveys, the species has conservatively been assumed present. If this species is present in the subject land, there is potential for the proposed development to have a significant impact.

TABLE E 3:AUSTROSTIPA WAKOOLICA EPBC ACT SIGNIFICANT IMPACT ASSESSMENT

Significant impact criteria	Likelihood	Justification
Lead to a long-term decrease in the size of a population	Scientific uncertainty	The Approved Conservation Advice for this species states that surveys for the species since its listing have identified a total population size of at least 1,000,000 individuals, a large proportion of which occurs in state forests and/or locations with few threats to long-term viability. Until targeted surveys are undertaken for the species during recognised survey periods, it is unknown as to whether the subject land contains a population. If present, the proposal is likely to lead to a long-term decrease through direct disturbance/removal of habitat and individuals.
Reduce the area of occupancy of the species	Unlikely	The area of occupancy for <i>Austrostipa wakoolica</i> has not been defined in any Commonwealth documents. The Distribution Map on the SPRAT profile, however, displays a relatively large area for which the species or species habitat is likely to occur. Furthermore, the Approved Conservation Advice suggest that, while confined to the floodplains of the Murray River tributaries, the total area of NSW which it occupies is relatively widespread (central-western and south-western NSW) and it is unlikely that the proposal will reduce the overall area of occupancy.
Fragment an existing population into two or more populations	Scientific uncertainty	As noted above, until targeted surveys are undertaken for the species during recognised survey periods, it is unclear as to whether the subject land contains a population of this species. If the species is present within the subject land, the proposal may fragment an existing important population into two or more populations.
Adversely affect habitat critical to the survival of a species	Scientific uncertainty	Habitat critical to the survival of the species is yet to be defined, although could be interpreted by the Conservation Advice as floodplains of the Murray River tributaries of central-western and south-western NSW (Commonwealth DCCEEW, 2014). Although the disturbed nature of the site makes it unlikely to represent 'critical habitat' for the species, the importance of the subject land to species viability is unknown. As noted above, until targeted surveys are undertaken for the species during recognised survey periods, it is unclear as to whether the subject land contains a population of this species. If present, there is uncertainty about whether the proposed development would adversely affect habitat critical to the survival of this species.

Disrupt the breeding cycle of a population	Scientific uncertainty	As noted above, until targeted surveys are undertaken for the species during recognised survey periods, it is unclear as to whether the subject land contains a population of this species. If determined present within the subject land the removal of 0.5368 ha is likely to disrupt the breeding cycle of a population by direct removal and disturbance of individuals and suitable habitat.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Scientific uncertainty	The proposed development will require the removal of potentially utilisable habitat by this species within the subject land. Until targeted surveys are undertaken for the species during recognised survey periods, it is unknown as to whether the subject land contains the species. If present, the proposal is likely to modify, destroy, remove, and 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 species' habitat	Unlikely	The proposal seeks to alter 0.5368 ha of moderately disturbed land which already contains a variety of weedy species. Provided mitigations measures (outlined in Section Error! Reference source not found.) are followed, the proposal is not likely to increase the number of invasive species within potential habitat areas.
Introduce disease that may cause the species to decline	Unlikely	There is insufficient information available on diseases impacting <i>Austrostipa wakoolica</i> ; however, the proposal is considered unlikely to introduce disease that may cause the species to decline.
Interfere with the recovery of the species	Unlikely	The Approved Conservation Advice suggests that the species is likely to be secure (with 95% confidence) over 100 years without any direct intervention / management. No specific recovery actions have been developed for this species. It is therefore unlikely that the proposal would interfere with the recovery of the species.

E1.4 GANG-GANG COCKATOO (*Callocephalon fimbriatum*)

Gang-gang Cockatoo is listed as Endangered under the EPBC Act, effective from 2 March 2022. This species is endemic to south-eastern Australia, predominantly occurring within temperate, dense eucalypt forests and woodlands, but has been reported in more open eucalypt assemblages, including subalpine Snow Gum woodlands, temperate rainforests, and occasionally regenerating forests (DAWE, 2022a). The species' preferred habitat also shifts with the seasons, in summer being found in tall mountain forests with dense understory and moving to lower altitudes in winter for drier, more open forests and woodlands. Gang-gang Cockatoo feeds on seeds obtained in trees and shrubs, mostly from eucalypts and wattles, and breeding habitat consists of mature, hollow-bearing trees.

This species was not recorded during field surveys of the subject land, however, there are records within 10 km of the subject area. The site is near the edge of known geographic limits for this species and contains suitable foraging habitat and potential breeding habitat for Gang-gang Cockatoo. Targeted surveys may be required to establish presence of this species within the subject land.

Following the Significant Impact Guidelines, the proposed modification is unlikely to have a significant impact on Gang-gang Cockatoo as detailed in the table below.

TABLE E 4: GANG-GANG COCKATOO EPBC ACT SIGNIFICANT IMPACT ASSESSMENT

Significant impact criteria	Likelihood	Justification
Lead to a long-term decrease in the size of a population	Unlikely	The most recent estimates of Gang-gang Cockatoo population size are that of 25,300 mature individuals (range 17,600 - 35,200) with a declining trend (DAWE, 2022a). The proposal includes clearing of modified grassland and some planted native overstory vegetation (up to 0.5368 ha). The proposal does not require the removal of any mature trees (aside from those that are planted and composed of non-naturally occurring species). Furthermore, it does not require the removal of any hollow-bearing trees. Due to the small number of trees being removed and their lack of habitat features (e.g. no hollows), the proposal is considered unlikely to lead to a long-term decrease in the size of a population.
Reduce the area of occupancy of the species	Unlikely	The area of occupancy for Gang-gang Cockatoo is estimated to be 30,000 km ² with the estimated range and occupancy trending stable (Garnet & Baker, 2021). The subject area falls at the western edge of the species' known range, and although Gang-gang Cockatoo are known to feed on a wide variety of eucalypt and introduced species, none of the species listed as of particular importance in the Conservation Advice are present. The proposal seeks to removal up to 0.5368 ha of modified grassland and some planted native overstory vegetation, none of which contains hollows. Due to this, the proposal is considered unlikely to reduce the area of occupancy for this species.
Fragment an existing population into two or more populations	Unlikely	The proposal is considered unlikely to fragment an existing population of Gang-gang Cockatoo into two or more populations due to the small amount of clearing of modified grassland and some planted native overstory vegetation involved, as well as the subject area' s moderate level of connectivity to other remnant woodland, reserves and National Parks within the broader area.
Adversely affect habitat critical to the survival of a species	Unlikely	Habitat critical to the survival of the Gang-gang Cockatoo varies between summer months and winter. In summer, the species favours tall mountain forests and woodlands, particularly within mature, wet sclerophyll forests with a dense, shrubby understory. In winter, they tend to move to areas of more open, grassy woodland at lower altitudes (Higgins & Al-Dabbagh, 1999). The Conservation Advice for this species considers all habitat utilisable for foraging and breeding purposes as habitat critical to the survival of the species. The proposal seeks to remove 0.5368 ha of modified grassland and some planted native overstory vegetation which, although at the western edge of the known and predicted range of Gang-gang Cockatoo, may be utilised for foraging. However, this habitat is suboptimal and does not contain nesting hollows. As such, is it unlikely that the proposal will adversely affect habitat critical to the survival of this species.

Disrupt the breeding cycle of a population	Unlikely	Gang-gang Cockatoo favours breeding in hollows in heavy wooded forest, particularly old growth forests. Gang-gang Cockatoo pairs generally utilise and maintain multiple nest trees over different years. Furthermore, Gang-gang Cockatoo was not observed in the area, however, local records are present in the surrounding landscape. The project does not involve the removal of any hollow bearing trees, and as such, it is unlikely that the proposed development will disrupt the breeding cycle of the populations of a population.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Unlikely	The proposal is not likely to modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline for Gang-gang Cockatoo due to the small scale of the proposed clearing (0.5368 ha) and connectivity to remnant woodland, nature reserves and National Parks within the broader landscape.
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	Unlikely	The proposal seeks to alter 0.5368 ha of moderately disturbed land which already contains a variety of weedy species. Invasive fauna species such as European Fox were recorded during surveys, and as such have already been introduced. Provided mitigations measures (outlined in Section Error! Reference source not found.) are followed, the proposal is not likely to increase the number of invasive species within potential habitat areas.
Introduce disease that may cause the species to decline	Unlikely	The above species are susceptible to Psittacine beak and feather disease (Pbfd). It is unknown if populations of the species carry the disease in the region. However, it is unlikely that the proposed development would further introduce this disease to the species population as the disease is transmitted through feather dander, faeces, and saliva, which is unlikely to be introduced in development works.
Interfere with the recovery of the species	Unlikely	<p>Recovery actions outlined within the species' Conservation Advice include the following (DAWE, 2022a):</p> <ul style="list-style-type: none"> • Cease all land clearing of habitat critical to the survival of Gang-gang Cockatoo. • Retain hollow-bearing trees in all known Gang-gang Cockatoo nesting areas. • Restore forests and woodlands within the known range of Gang-Gang Cockatoo. • Protect and enhance the quality of potential habitat (both breeding and foraging) of the Gang-gang Cockatoo. <p>The subject land contains areas of open, grassy woodland which the Gang-gang Cockatoo favours in the winter months. Although the species was not observed during surveys, there remains a possibility that the species may utilise the subject land opportunistically and in transit. However, the proposal seeks to alter 0.5368 ha of mostly modified grassland and some planted native vegetation which includes up to four semi-mature eucalypts that do not contain habitat features considered likely to be utilised by this species. Therefore, the proposal is considered unlikely to interfere with the recovery of the Gang-gang Cockatoo as it seeks to clear 0.5368 ha of potential, mostly suboptimal foraging.</p>

E1.5 SPOTTED-TAILED QUOLL (*DASYURUS MACULATUS MACULATUS* (SE MAINLAND POPULATION))

Spotted-Tailed Quoll (*Dasyurus maculatus maculatus*) is listed Endangered under the EPBC Act, effective May 2004. The species is a primarily forest-dependent species, occupying a wide range of habitat types including rainforest, wet and dry sclerophyll forest, coastal heathland, scrub and dunes, woodland, heathy woodland, swamp forest, mangroves, beaches and sometimes grasslands and pastoral areas adjacent to forested areas (Vic DELWP, 2016).

The species was not recorded within the site during the field survey but has been recorded within the surrounding landscape of the subject land. Marginal habitat occurs within the subject land in the form of modified grasslands and planted overstorey vegetation which could provide foraging habitat to the species. The subject land lacks habitat features commonly associated as breeding habitat such as rocky areas. Minor areas of course woody debris are present in Zone 4 and may be suitable foraging habitat, however, are not significant enough to be considered as breeding habitat.

Following the Significant Impact Guidelines, the proposed modification is unlikely to have a significant impact on Spotted-tailed Quoll as detailed in the table below.

TABLE E 5: SPOTTED-TAILED QUOLL EPBC ACT SIGNIFICANT IMPACT ASSESSMENT

Significant impact criteria	Likelihood	Justification
Lead to a long-term decrease in the size of a population	Unlikely	Spotted-tailed Quoll occupy a broad range of habitat types across their geographic distribution. The subject land may provide suboptimal foraging habitat to this species in the form of planted native overstorey vegetation containing minor areas of fallen timber (considered too small for as a denning resource), as well as derived and modified grasslands. Areas of habitat also occur beyond the subject land in the form of Boiling Down Creek. The low abundance of habitat features present within the subject land and their potential removal are considered unlikely to significantly reduce food resources or lead to the long-term decrease in the size of Spotted-Tailed Quoll populations.
Reduce the area of occupancy of the species	Unlikely	Department of Environment, Land, Water and Planning notes that the species mainland distribution ranges from south-eastern Queensland, through eastern NSW into southern Victoria. Their extent of occupancy is estimated at 596,344 km ² (Commonwealth DCCEEW, 2020a). The proposals removal of 0.5368 ha of mostly modified grassland and up to four planted overstorey trees is considered unlikely to lead to a reduction in the area of occupancy of this species.
Fragment an existing population into two or more populations	Unlikely	Spotted-Tailed Quolls are a mobile species, with relatively large home ranges. Few records of the species are present within 10 km of the subject land. Given this, and the present habitat within the subject area and directly surrounding, it is considered unlikely to support a population of this species. The proposals removal of 0.5368 ha of mostly modified grassland and up to four planted overstorey trees is considered unlikely to fragment an existing population into two or more populations.
Adversely affect habitat critical to the survival of a species	Unlikely	The Victorian Department of Environment, Land, Water and Planning (2016) describes critical habitat for survival of the species as including large patches of forest with adequate denning resources and relatively high densities of medium-size mammalian prey. However, the thresholds of densities of these critical components are unknown, consequently there is insufficient information to identify if a potential habitat may be utilised in the future. The subject land does not contain habitat features considered likely to be utilised for denning or was observed to contain high densities of medium-size mammalian prey. It is considered unlikely to support a population of this species. The proposal's removal of 0.5368 ha of mostly modified grassland and up to four planted overstorey trees is considered unlikely to adversely affect habitat critical to the survival of a species.
Disrupt the breeding cycle of a population	Unlikely	Breeding season for Spotted-Tailed Quoll occurs between April and July. Although breeding may not always occur in successive years, most

		<p>females produce a litter annually. The gestation period is 21 days, producing an average litter of five. The young are kept in a rudimentary pouch until they are large enough to be left behind in the den while their mother forages for food. Outside of breeding the Department of Environment, Land, Water and Planning (2016) notes the species use multiple dens, moving between them every 1-4 days. Maternal den sites include rock crevices, caves, boulder tumbles, hollow logs, hollow tree roots and burrows, either dug by females in suitable substrate or disused burrows of other species (wombats or rabbits). Habitat features within the subject land are not considered suitable to be utilised as breeding habitat for this species. Due to the lack breeding habitat features, the proposals removal of 0.5368 ha of mostly modified grassland and up to four planted overstory trees is considered unlikely to disrupt the breeding cycle of a population.</p>
<p>Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline</p>	<p>Unlikely</p>	<p>As noted previously, the species requires habitat that includes large patches of forest with adequate denning resources and relatively high densities of medium-size mammalian prey. However, the thresholds of densities of these critical components are unknown, consequently there is insufficient information to determine whether the habitat present on the site meets the threshold of needs for the Spotted-Tailed Quoll. Given the lack of breeding habitat and only containing minor foraging habitat, proposals removal of 5368 ha of mostly modified grassland and up to four planted overstory trees is considered unlikely to lead to a decline in this species.</p>
<p>Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat</p>	<p>Unlikely</p>	<p>The proposal seeks to alter 0.5368 ha of moderately disturbed land which already contains a variety of weedy species. Invasive fauna species such as European Fox were recorded during surveys, and as such have already been introduced. Provided mitigations measures (outlined in Section Error! Reference source not found.) are followed, the proposal is not likely to increase the number of invasive species within potential habitat areas.</p>
<p>Introduce disease that may cause the species to decline</p>	<p>Unlikely</p>	<p>The species is known to contract Protozoans Toxoplasmosis by eating infected meat of warm-blooded animals and transmission through cat parasites that are carrying the protozoan. The proposal is considered unlikely to increase or lead to an extension of feral cat populations within the area as it does not include infrastructure to support this species. Due to this, it is unlikely that this proposal would result in the introduction of a disease that may cause the species to decline.</p>
<p>Interfere with the recovery of the species</p>	<p>Unlikely</p>	<p>A National Recovery Plan for the Spotted-Tailed Quoll was finalized in 2016. It outlines habitat loss, threats posed by introduce predators and their control practices (1080 baiting), deliberate kills, impacts of fire regimes, road mortality, and climate change as significant pressures leading to species decline (Vic DELWP, 2016). The key recognised threat for the species is loss of habitat, primarily loss of core habitat and habitat corridors. To prevent further fragmentation the Recovery Plan notes that in areas where populations are known to occur, or where properties contain suitable habitat for the species, conservation efforts are targeted at habitat retention and management of feral and pest animals. Given the lack of present breeding habitat and only containing minor foraging habitat, proposals removal of 5368 ha of mostly modified grassland and up to four planted overstory trees is considered unlikely to interfere with the recovery of the species.</p>

E1.6 KEY'S MATCHSTICK GRASSHOPPER (*KEYACRIS SCURRA*)

Key's Matchstick Grasshopper is listed as Endangered under the EPBC Act, effective 5 October 2022. Additionally, it is listed as threatened in every state and territory in which it occurs, including NSW.

Key's Matchstick Grasshopper is a small, thin, wingless grasshopper which is characterised by its slanted face, splayed hind femora and ensiform antennae. The species is variable in colour, ranging from brown to green, with brown being the most common form. It is typically associated with native grasslands, secondary native grasslands, or areas containing Kangaroo Grass (*Themeda triandra*) with appropriate disturbance regimes (Commonwealth DCCEEW, 2020b). These regimes are mostly observed through the following land-uses which are characterised by infrequent disturbance:

- Railway easements,
- travelling stock reserves,
- cemeteries, and
- conservation reserves (mainly within the ACT).

This species was not recorded within the subject area and has not been recorded within 10 km of the site; however, there is some potential habitat within the subject area. This species is highly sensitive to modified landscapes and its habitat is severely fragmented. As the proposal seeks to clear up to 0.5368 ha of potential habitat, if this species is determined to be present, there is potential for the proposed development to have a significant impact.

TABLE E 6:KEY'S MATCHSTICK GRASSHOPPER EPBC ACT SIGNIFICANT IMPACT ASSESSMENT

Significant impact criteria	Likelihood	Justification
Lead to a long-term decrease in the size of a population	Potential	The proposal seeks to clear up to 0.5368 ha of modified, derived, and native grassland, all of which has the potential to contain suitable habitat for Key's Matchstick Grasshopper. Although surveys did not detect the species, targeted surveys during spring or summer months are required to determine the presence of this species. If present, the proposed clearing of grassland may lead to a long-term decrease in the size of a population of Key's Matchstick Grasshopper.
Reduce the area of occupancy of the species	Potential	The area of occupancy for this species is highly restricted, consisting of just 124 km ² (Commonwealth DCCEEW, 2020b). If the species is determined to be present within the subject area, the proposed clearing of up to 0.5368 ha of grassland has the potential to reduce the area of occupancy of Key's Matchstick Grasshopper.
Fragment an existing population into two or more populations	Potential	Key's Matchstick Grasshopper is a severely fragmented species, with very small populations occurring in very isolated habitats. Any disturbance to these populations has the potential to increase this fragmentation. As the proposal seeks to clear up to 0.5368 ha of grassland, if this species is determined to be present, there is potential for the proposal to further fragment an existing population into two or more populations.
Adversely affect habitat critical to the survival of a species	Potential	While critical habitat for this species is not completely understood, it is known that the species requires open grasslands and prefers those with a high occurrence of Kangaroo Grass, as well as potential feed species in the family Asteraceae. The composition of the understory, as well as the rates of disturbance to the habitat, influence habitat suitability. The subject area contains up to 0.5368 ha of suitable habitat which will be affected by the proposal. If the species is determined to be present, the proposal has the potential to adversely affect habitat critical to the survival of the species.
Disrupt the breeding cycle of a population	Potential	Observations on Keys Matchstick Grasshopper breeding suggest that the species only produces a single generation per year with eggs hatching over the months of December and January. Generally, males will reach maturity by May, while females overwinter as nymphs and do not mature until the spring. The species has a low fecundity, with the maximum number of eggs reported per female being 40, with 25 being the average. The period of October-December and March-September are thought to be the periods of highest activity for the species, requiring increased movement of both sexes.

		Presence of this species within the subject area has not been determined. If present, the removal of up to 0.5368 ha of grassland habitat has the potential to disrupt the breeding cycle of a population.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Potential	The subject area contains areas of grassland which could potential be suitable habitat for Key's Matchstick Grasshopper; however, without targeted surveys to determine the species' presence, impacts of the development are uncertain. If the species was determined to be present, the proposal has the potential to modify, destroy, remove or isolate or decrease the availability or quality of habitat which would contribute to a decline in Key's Matchstick Grasshopper.
Result in invasive species that are harmful to a vulnerable species becoming established in the species' habitat	Unlikely	The proposal seeks to alter 0.5368 ha of modified grassland and planted vegetation which already contains a variety of weedy species. Invasive fauna species such as European Fox were recorded during surveys, and as such have already been introduced. Provided mitigation measures (outlined in Section Error! Reference source not found.) are followed, the proposal is not likely to increase the number of invasive species to the subject land.
Introduce disease that may cause the species to decline	Unlikely	There is limited available information indicating the introduction of disease through clearing and construction works for developments may impact Key's Matchstick Grasshopper. Furthermore, mitigation measures have been proposed to implement hygiene protocols minimising the potential for weeds and pathogens entering the subject land which are likely to significantly reduce the likelihood of disease entering the subject land. Therefore, it is unlikely that the proposal would introduce disease that may cause the species to decline.
Interfere with the recovery of the species	Scientific Uncertainty	The species was listed as Endangered under the EPBC Act in October 2022 with no adopted or made Recovery Plan for this species. Approved Conservation Advice has been used to implement priority management actions, mitigate key threats, and support the recovery of the endangered species. Until targeted surveys are undertaken and greater understanding of habitat of the species is determined, it is not known as to whether the proposal will interfere substantially with the recovery of the species.

E1.7 PINK COCKATOO (*LOPHOCHROA LEADBEATERI*)

Pink Cockatoo is listed as Endangered under the EPBC Act, effective from 31 March 2023. This species is endemic to arid and semi-arid inland Australia, living in arid and semi-arid woodlands dominated by Mulga (*Acacia aneura*), mallee and box eucalypts, Slender Cypress Pine (*Callitris gracilis*) or Belah (*Casuarina cristata*) (Commonwealth DCCEEW, 2023c). Within these vegetation types, the subspecies main requirements are fresh surface water and trees with suitable nesting hollows. The species prefers to feed in or close to wooded areas, and they also use wooded areas for travel between feeding areas and nesting or roosting sites. Pink Cockatoo thrives on grain spilt during harvest and left lying on the stubble throughout winter and seed from weeds, but primarily feeds on seeds from a wide variety of native species (Rowley and Kirwan, 2023).

This species was not recorded within the subject land during field surveys, however, there is one record within 10 km of the proposal area. No signs of breeding were observed during targeted surveys of the subject land (**Section 5.3.1**); however, surveys were undertaken outside breeding period and the site contains potential foraging, transitional and breeding habitat for Pink Cockatoo.

Following the Significant Impact Guidelines, the proposal is unlikely to have a significant impact on Pink Cockatoo as detailed in the table below.

TABLE E 7: PINK COCKATOO EPBC ACT SIGNIFICANT IMPACT ASSESSMENT

Significant impact criteria	Likelihood	Justification
Lead to a long-term decrease in the size of a population	Unlikely	The most recent estimates of Pink Cockatoo population size are that of 15,000 mature individuals (range 10,000 – 20,000) with a declining trend (Commonwealth DCCEEW, 2023c). The proposed development would require impacts to a small amount of degraded grassland with no impact to trees that provide potential breeding habitat. The extent of habitat remaining in the area after the proposed development would likely provide sufficient foraging resources to sustain future visitation, such that the development is unlikely to lead to a long-term decrease in the size of the Pink Cockatoo population.
Reduce the area of occupancy of the species	Unlikely	Pink Cockatoo's extent of occurrence (EOO) and area of occupancy (AOO) are estimated at 850,000 km ² (range 800,000-900,000 km ²) and 225,000 km ² (150,000-300,000 km ²) with both EOO and AOO trending stable (Commonwealth DCCEEW, 2023c). As the subject land is relatively small in comparison to the range of the species and the development does not propose removing potential breeding or quality foraging habitat, the development is considered unlikely to reduce the area of occupancy of Pink Cockatoo.
Fragment an existing population into two or more populations	Unlikely	Pink Cockatoo is a highly mobile species, likely to undertake seasonal migrations within the region. Families join a local nomadic flock during summer and spend autumn and winter wandering over 300 km ² (Rowley and Kirwan, 2023). The proposed development is removing a small area of potential foraging habitat that is not considered important for connectivity for this species. Development of the site will not prohibit the species from moving around and accessing the surrounding landscape or impede movement between existing populations.
Adversely affect habitat critical to the survival of a species	Unlikely	Critical habitat identified in the Conservation Advice for Pink Cockatoo consists of arid and semi-arid woodlands dominated by Mulga, mallee and box eucalypts, Slender Cypress Pine or Belah. It also includes known habitat containing suitable attributes where there are large mature trees with suitable hollows and surrounding matrix of these areas that provide movement corridors for dispersal across the landscape. For breeding the species requires hollows in trunks, limbs, or dead sprouts in trees that are large and tall relative to the typical structure of arid and semi-arid woodlands. Good nesting habitat is more likely to be found in intact mature woodland. Remnant vegetation surrounding

		<p>agricultural land has also been used for nesting (Commonwealth DCCEEW, 2023c). While at the time of the survey, hollow-bearing trees in the subject land were not observed to be used or maintained, there is potential for it to be used in the future.</p> <p>The proposed development would require the removal of up to 0.5368 ha of modified grasslands, planted vegetation and small area of regeneration that provides a potential sub-optimal movement corridor and foraging habitat. Therefore, the removal of 0.5368 ha of potential foraging habitat in the form of predominantly degraded grasslands is unlikely to have adverse effects on habitat critical to the survival of the species.</p>
Disrupt the breeding cycle of a population	Unlikely	<p>Pink Cockatoo favours breeding in hollows in very old trees in large hollows within arid and semi-arid woodlands. Pink Cockatoo pairs generally utilise and traditional nest-hollows over multiple years. The proposed development does not involve the removal of any mature hollow bearing trees suitable for the species, and therefore it is unlikely to disrupt the breeding cycle of a Pink Cockatoo population.</p>
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Unlikely	<p>The subject land contains native trees and shrubs are present in the surrounding vegetation including various <i>Acacia</i> species which have been identified as food sources for the species (Commonwealth DCCEEW, 2023c). The proposed development would require the removal of potential foraging habitat and movement corridors within the subject land and reduce habitat availability at the local scale, potentially contributing to threatening processes for Pink Cockatoo. However, due to the limited extent and low quality of the habitat proposed for removal, it is unlikely that this would cause a significant decline in the species.</p>
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	Unlikely	<p>The subject land is moderately disturbed with multiple invasive fauna species observed and contains several invasive weed species. The proposed action is not likely to result in further establishment of invasive species that are harmful to endangered species habitat provided mitigation measures (Section 8.4) are undertaken during the construction phase, and monitoring and maintenance of any weed incursions are undertaken during future use of the subject land.</p>
Introduce disease that may cause the species to decline	Unlikely	<p>Pink Cockatoos are susceptible to Psittacine beak and feather disease (Pbfd). It is unknown if populations of the species carry the disease in the region. However, it is unlikely that the proposed development would further introduce this disease to the species population as the disease is transmitted through feather dander, faeces, and saliva, which is unlikely to be introduced in development works.</p>
Interfere with the recovery of the species	Unlikely	<p>A Recovery Plan is required, however has not yet been created. Recovery actions outlined by Australian Commonwealth DCCEEW include (but are not limited to):</p> <ul style="list-style-type: none"> • Protect, restore and enhance the quality of known suitable habitat and increase the extent of habitat for the species across its range (current and future) to maintain viability in response to threats including climate change. • Protect large old trees and smaller trees that contain large hollows as well as ensure the recruitment of large old trees. • Maintain connectivity within and between regions. • Ensure the year-round availability of surface water in close proximity to foraging and nesting habitat, as well as maintain vegetation in proximity to water points to provide cover and resting place for drinking birds. <p>The project will contribute to threats to the species through the loss of potential foraging habitat. The removal of 0.5368 ha of grasslands, planted vegetation and small area of regeneration of Grey Box within the subject land does not align with recovery actions for this species. However, given that no breeding habitat will be impacted and the extent and condition of habitat to be removed, it is unlikely that it would interfere substantially with the recovery of the species.</p>

E1.8 HOODED ROBIN (SOUTH-EASTERN FORM) (*MELANODRYAS CUCULLATA CUCULLATA*)

Hooded Robin (south-eastern form) is listed as Endangered under the EPBC Act, effective March of 2023. Hooded Robin occurs in south-eastern Australia from far south-east Queensland to Yorke Peninsula, South Australia, intergrading with *M. c. picata* in the southern Murray Darling basin (Schodde & Mason, 1999). The subspecies is now absent from many formerly occupied sites, particularly in the wetter areas of the south and east (DE, 2024c).

Big blocks of open woodland are key habitat requirements, though they appear to like some past disturbance such as regenerating areas ringbarked about 20–30 years ago (DE, 2024c). The species is dependent on a complex structure of at least small trees, open ground/grass cover and fallen timber and they are told to have a fairly strong flocking behaviour with larger blocks (around 100 ha) allowing this activity (DE, 2024c).

While Hooded Robin was not observed during field surveys, the presence of records and potential utilizable habitat suggests that the species may use the subject land on occasion in the future. Targeted surveys may be required to make a more robust determination of likely use of the subject land; however, this species may have a low probability of detection using targeted surveys and, in this case, occurrence cannot be entirely discounted.

Following the Significant Impact Guidelines, the proposal has some potential to have a significant impact on Hooded Robin (south-eastern form) as detailed in the table below.

TABLE E 8:HOODED ROBIN (SOUTH-EASTERN FORM) EPBC ACT SIGNIFICANT IMPACT ASSESSMENT

Significant impact criteria	Likelihood	Justification
Lead to a long-term decrease in the size of a population	Unlikely	Hooded Robin (south-eastern form) has an estimated population of 68,000 (36,000 – 113,000) with a declining trend (Commonwealth DCCEEW, 2023d). The proposed development would require the removal of 0.5368 ha of potential foraging habitat, and up to four trees within Vegetation Zone 4 that may provide potential breeding habitat. The proposed development does not impact a significant amount of vegetation that this species utilises for foraging or breeding habitat. Due to this, the proposal is unlikely to lead to a long-term decrease in the size of Hooded Robin (south-eastern) populations.
Reduce the area of occupancy of the species	Unlikely	The Hooded Robin’s (south-eastern) extent of occurrence (EOO) and area of occupancy (AOO) are estimated at 1,200,000 km ² (range 1,100,000-1,400,000 km ²) and 30,000 km ² (16,000-50,000 km ²), respectively, however, it is likely that the real AOO is at least twice the proposed size (Ford <i>et al.</i> , 2021). The range of the species is considered to be considerable, with the proposal to retain the majority of mature trees within the subject land, only seeking to remove up to four planted trees from Vegetation Zone 4 with no observed habitat features. Therefore, the proposed development is not likely to reduce the area of occupancy of the species.
Fragment an existing population into two or more populations	Unlikely	Hooded Robin (south-eastern) is believed to be a sedentary bird species that do not undertake migratory behaviours. The population distribution is not considered to be severely fragmented (Ford <i>et al.</i> , 2021). The proposal requires the removal of up to 0.5368 ha of potential foraging habitat and up to four planted trees that is not considered important for connectivity for this species. The proposed development will not prohibit the species from moving around and accessing habitats and resources within the subject land, surrounding landscape, or impede movement between existing populations.
Adversely affect habitat critical to the survival of a species	Potential	Conservation advice provided by Commonwealth DCCEEW (2023d) indicates habitat critical to the survival of the species to include: <ul style="list-style-type: none"> dry eucalypt and acacia woodlands and shrublands remnants with an open understory, some grassy areas and a complex ground layer, often in or near clearings or open areas;

		<ul style="list-style-type: none"> 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. <p>Habitat present within the subject land mostly does not comprise structurally diverse habitat features, such as a midstory, tall native grasses, rocky habitat or abundant fallen timber for foraging habitat. However, the habitat within the subject land would fall into the dry eucalypt woodland category near open areas with living and dead trees present for nesting, roosting and foraging. Therefore, in accordance with this criteria habitat present within the subject land might be considered habitat critical to the survival of the Hooded Robin (south-eastern).</p> <p>The proposed development would require the removal of 0.5368 ha of potential foraging habitat in the form of degraded grassland, and four trees potentially utilised as breeding habitat. Therefore, although a small impact, as outlined in the Conservation Advice, the proposal has the potential to adversely affect habitat critical to the survival of the species within the subject land.</p>
Disrupt the breeding cycle of a population	Unlikely	<p>The species form pairs that occupy territories during breeding (between July and November) and non-breeding seasons, typically returning to the same breeding site each season (Commonwealth DCCEEW, 2023d). Small nest cups are typically found within the fork of a tree or tree crevice from less than 1 m to 5 m above ground. Surveys within the subject land found no evidence of likely Hooded Robin nest structures.</p> <p>The proposal seeks to remove up to four planted trees within Vegetation Zone 4 which may provide potential nesting habitat within the subject land. However, relative to quality habitat suited to the species available in the wider landscape, the removal of a relatively small amount of planted vegetation from within the subject land is considered unlikely to disrupt the breeding cycle of a population.</p>
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Unlikely	<p>The proposed development will involve the removal of up to 0.5368 ha of predominantly degraded grassland habitat that may be utilised for foraging by this species, and up to four planted trees with no habitat features. Mature trees or quality habitat for the species, such as complex shrubby vegetation, will not be reduced through the proposal. As such, the proposal will reduce a small amount of potential foraging habitat at the local scale, and it is considered unlikely that this could cause a significant decline in the species.</p>
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	Unlikely	<p>The subject land is moderately disturbed and contains several invasive weed species. The proposed action is not likely to result in further establishment of invasive species that are harmful to endangered species habitat provided mitigation measures (Section 8.4) are undertaken during the construction phase and monitoring and maintenance of any weed incursions are undertaken during future use of the subject land.</p>
Introduce disease that may cause the species to decline	Unlikely	<p>There is limited available information indicating the introduction of disease through clearing and construction works for developments that may impact Hooded Robin (south-eastern). Furthermore, mitigation measures have been proposed to implement hygiene protocols minimising the potential for weeds and pathogens entering the subject land which are likely to significantly reduce the likelihood of disease entering the subject land. Therefore, it is unlikely that the development of the subject land would introduce diseases that may cause the species to decline.</p>
Interfere with the recovery of the species	Potential	<p>The Australian Government, DCCEEW (2023) Conservation Advice presents recovery actions for this species to include (but not limited to):</p> <ul style="list-style-type: none"> Stable or increasing population across the range. Cease all land clearing of habitat critical for the survival of Hooded Robin (south-eastern). Retain and restore all remnant woodland patches in areas of habitat critical for the survival of Hooded Robin (south-eastern).

-
- Promote ecological management of woodland remnants on private and public land.
 - Control firewood collection including limiting the removal of live and dead timber.
 - Encourage the retention of woody ground debris.
 - Identify different practical methods for restoring the structure and function of the ground layer in degraded habitat, including soil biota and its functionality.

Habitat critical for the survival of Hooded Robin (south-eastern) (i.e. dry eucalypt woodland near open areas) will be impacted through the proposal in the form of up to four planted trees potentially being removed. The removal of 0.5368 ha of potential foraging and breeding habitat from within the subject land is considered to be a small area of impact to predominantly modified habitat. However, the proposed development does not align with the Conservation Advice, therefore there is a potential that the proposal may interfere with the recovery of this species.

E1.9 KOALA (*PHASCOLARCTOS CINEREUS*)

Koala is listed as Endangered under the EPBC Act, effective 12 February 2022. Koala distribution is widespread in NSW, occurring in patches across coastal and inland areas of eastern and southern Australia. Koala is a specialist folivore that predominantly browses on the leaves of *Eucalyptus*, *Corymbia* and *Lophostemon* species, residing in a range of forest and woodland types (DAWE, 2022c). Non-food tree species are also an essential resource to Koalas, utilising them for shelter to thermoregulate and avoid predation. Koalas move between locations to access habitat resources, including moving with the influence of the season. Therefore, areas that do not presently have a population residing can still be considered potential Koala habitat.

As arboreal folivores, Koalas depend on specific tree species for survival, with these species varying throughout NSW and with available habitats. A NSW review of studies on Koala tree use within Koala management regions within the State found that for the Western Slopes and Plains region, the predominant canopy present within the subject land, Grey Box, shows evidence of Koala tree use (NSW OEH, 2018). Furthermore, Koala BAM Survey Guidelines also highlight Grey Box as a Koala use tree within the Riverian region, for which the subject land is regionally classified as per this report (NSW DPE, 2022e).

Although Koala was not recorded in the subject land, the transient nature of this species and known records within 10 km means it cannot be excluded as having the potential to utilise the subject land and the identified Koala use trees within it.

Following the Significant Impact Guidelines, the proposal is unlikely to have a significant impact on Koala as detailed in the table below.

TABLE E 9:KOALA EPBC ACT SIGNIFICANT IMPACT ASSESSMENT

Significant impact criteria	Likelihood	Justification
Lead to a long-term decrease in the size of a population	Unlikely	<p>Recent population estimates for Koala suggest approximately 92,000 mature individuals in Australia (86,000 - 92,000), with a contracting trend (DAWE, 2022b). As development increases, local and wider Koala populations are under increased pressure and at risk of decline.</p> <p>The subject land contains significant use trees for Koala in the form of mature Grey Box (<i>Eucalyptus microcarpa</i>) found in Vegetation Zone 1 (refer to Figure 11)(NSW DPE, 2022e). However, Vegetation Zone 1 will be retained, therefore no identified mature Koala use trees for the region will be removed. The proposal will require the removal of up to four trees that are not Box Gum woodland associated species within the planted Vegetation Zone 4, however, the suitability and resources these trees provide to local Koala populations is uncertain, likely minimal.</p> <p>The proposal's removal of up to 0.5368 ha of grasslands, planted vegetation and small area of regeneration may provide suitable dispersal habitat for Koala as it moves through the landscape to forage. However, the removal of such habitat is unlikely to contribute to the cumulative loss of habitat available to Koala in the locality through increase fragmentation therefore it is unlikely to lead to a long-term decrease in a size of a population</p>
Reduce the area of occupancy of the species	Unlikely	<p>Koala distribution is described to range from far north-east Queensland to the south-eastern corner of South Australia, and as far west as semi-arid regions in Queensland and NSW. Koala distribution has shrunk across NSW, with declines documented from the eastern coastal bioregions to the western populations. These declines have been driven by habitat loss, temperature increase and drought. As the proposal only seeks to remove predominantly modified grassland habitat, likely only utilised in a transient nature, and given the large distribution of Koala, it is unlikely that removal of a relatively small area of for the proposal will reduce the area of occupancy of the species.</p>
Fragment an existing population into two or more populations	Unlikely	<p>Koalas are a mobile species, transitioning between and through different habitats. They are particularly susceptible to habitat fragmentation and the disruption/removal of habitat corridors through land clearing. The proposal does not propose the removal of any mature Koala significant use trees from</p>

		within the subject land. Therefore, is considered unlikely to be a sufficient modification to contribute to fragmentation of an existing population of Koala into two or more populations.
Adversely affect habitat critical to the survival of a species	Potential	<p>Critical habitat for Koalas is described by the Conservation Advice (DAWE, 2002b) as the combined assemblage of habitat qualities that are theoretically required to stop the decline and promote the recovery of the species. Attributes of such habitat can include:</p> <ul style="list-style-type: none"> • whether the habitat is used during periods of stress (e.g., flood, drought, or fire), • whether the habitat is used to meet essential life cycle requirements (e.g., foraging, breeding, social behaviour, dispersal), • the extent to which the habitat is used by important populations, • whether the habitat is necessary to maintain genetic diversity and long-term evolutionary development, • whether the habitat is necessary for use as corridors to allow the species to move freely between sites used to meet essential life cycle requirements, • whether the habitat is necessary to ensure the long-term future of the species or ecological community through reintroduction or re-colonisation, and • any other way in which habitat may be critical to the survival of a listed threatened species or a listed threatened ecological community. <p>Although Koala was not observed during surveys of the subject land, it is known to occur in the locality and the roaming nature of this species means it cannot be ruled out as potentially utilising the subject land. The removal of up to 0.5368 ha of potentially usable dispersal habitat, including regenerating Koala use trees, and up to four planted trees not identified as significant use trees, may have a potential to adversely affect habitat critical to the survival of the species.</p>
Disrupt the breeding cycle of a population	Unlikely	Koala reproduction is influenced by season, with breeding commonly occurring between the months of September and February. Surveying was conducted during breeding season, with no observations of the species made, or signs of breeding. However, local factors such as population density, food quality and availability also impact breeding, thus, breeding may not occur every year if conditions are unfavourable. It is unclear as to whether a breeding Koala population occurs within the subject land. The proposal does not seek to remove any mature Koala use trees, that can be found within Vegetation Zone 1. It is considered unlikely that proposal will cause a disruption to the breeding cycle of a population.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Unlikely	The proposal does not seek to remove any significant use trees; however, it will require the removal of 0.5368 ha of predominantly modified grassland and up to four trees not associated with Box Gum Woodland from the subject land. Given the small impact area of the proposal, that the species was not detected within the development site, and that there is suitable quality habitat in the surrounding landscape, it is considered unlikely that the proposal will modify, destroy, remove, isolate or decrease the availability or quality of the 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 species' habitat	Unlikely	The proposal seeks to alter 0.5368 ha of moderate disturbed land which already contains a variety of weedy species. Multiple species of invasive fauna species such as European Fox were recorded during surveys, and as such have already been introduced. Provided mitigations measures (outlined in Section Error! Reference source not found.) are followed, the proposal is not likely to increase the number of invasive species within potential habitat areas.
Introduce disease that may cause the species to decline	Unlikely	The DAWE notes that Koalas carry a range of parasites and pathogens, of primary concern are infections caused by the bacterium <i>Chlamydia pecorum</i> which leads to chlamydial disease, as well as the Koala retrovirus. Chlamydia causes conjunctivitis leading to blindness, urinary tract infections, pneumonia, and infertility in females. Consequentially, the prevalence of chlamydia as a common cause of infertility within Koala populations has led to a significant decline in contemporary populations. Even so, it is unlikely that the proposed development would further introduce this disease to the species population as the disease is transmitted sexually or by eating infected pap (nutritious type of

		faeces excreted by mothers for young koalas), which is considered unlikely to be introduced in development works.
Interfere with the recovery of the species	Unlikely	<p>The current National Recovery Plan for Koala has been in effect since March 2022, being updated subsequently to the extensive impacts that the 2019/20 bushfires had on Koala populations (DAWE, 2022c). The goal of the recovery plan is to stop the declining trend of Koala populations, by having resilient, connected and genetically healthy metapopulations across its ranges to increase the extent, quality and connectivity of habitat occupied. Habitat required for the recovery of the species occurs across a range of landscapes, with different habitats being utilised through time and space. Although surveying may not have observed the presence of Koalas on site, the species naturally shifts between suitable habitats and often utilises areas depending on food availability. Therefore, despite habitat not being utilised during this survey period, we cannot rule out Koalas being present in other seasons and years.</p> <p>The proposal does not propose the removal of any mature significant Koala use trees; however, it will require the removal of 0.5368 ha of predominantly modified grassland, regenerating Koala use trees and up to four trees not associated with Box Gum Woodland. These actions contribute to land clearing of potential future habitats of the species and reduces the dispersal ability of the species. However, as the proposal does reduce habitat available to Koalas, and consequently it is unlikely to interfere with the recovery of this species.</p>

E2 Vulnerable species

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

- lead to a long-term decrease in the size of an important population of a species
- reduce the area of occupancy of an important population,
- fragment an existing 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.

E2.1 SOUTHERN WHITEFACE (*APHELOCEPHALA LEUCOPSIS*)

Southern Whiteface is listed Vulnerable under the EPBC Act, effective from 31 March 2023. The species occur across most of mainland Australia south of the tropics, from the north-eastern edge of the Western Australian wheatbelt, east to the Great Dividing Range (Commonwealth DCCEEW, 2023b). The species inhabits arid and semi-arid acacia and eucalypt woodland and shrubland (especially mulga, also mallee), with understorey of grass and low shrub. It is sometimes in Cypress Pine (*Callitris*) woodland and shrubland (Gregory, 2020). The species forage almost exclusively on the ground, favouring habitat with low tree densities and an herbaceous understorey litter cover.

While Southern Whiteface was not observed during field surveys, the presence of utilizable habitat and multiple records within 10 km suggests that it may use the subject land on occasion in the future. Targeted surveys may be required to make a more robust determination of likely use of the subject land; however, this species may have a low probability of detection using targeted surveys and, in this case, occurrence cannot be entirely discounted. The species may utilize the subject land on rare occasions, however, is not considered likely to contain or support an 'important population'.

Following the Significant Impact Guidelines, the proposal has some potential to have a significant impact on Southern Whiteface as detailed in the table below.

TABLE E 10: SOUTHERN WHITEFACE EPBC ACT SIGNIFICANT IMPACT ASSESSMENT

Significant impact criteria	Likelihood	Justification
Lead to a long-term decrease in the size of an important population of a species	Unlikely	An important population is not defined in the Australian Government, DCCEEW Conservation Advice or any other relevant literature. However, there are currently considered to be approximately 477,000 (range 236,000 – 954,000) mature individuals in the wild, consisting of the total population of both subspecies (Commonwealth DCCEEW 2023b). The proposed development would remove of 0.5368 ha of potential foraging habitat, and up to four trees within Vegetation Zone 4 that may provide potential breeding habitat. However, given the condition and extent of impacted habitat, it is unlikely that the proposed development will lead to a long-term decrease in the size of an important population.

Reduce the area of occupancy of an important population	Unlikely	The extent of occurrence (EOO) for the species is estimated to be 4,910,000 km ² as estimated using occurrence records from 2000 - 2021 with an area of occupancy (AOO) estimated to be 80,000 km ² (range 65,000-140,000 km ²) (Commonwealth DCCEEW, 2023b). Therefore, the proposed development is not likely to reduce the area of occupancy of an important Southern Whiteface population.
Fragment an existing important population into two or more populations	Unlikely	Southern Whiteface is believed to be a sedentary bird species that does not undertake migratory behaviours. The population distribution is not considered to be severely fragmented (Ehmke et al, 2021). The proposed development seeks to remove 0.5368 ha of potential foraging habitat, and up to four trees for potential breeding habitat. The degraded grassland habitat present within the subject land is not considered important for connectivity for this species. Development of the subject land will remove a small amount of potential breeding or nesting habitat; however, the habitat being removing is within a plantation, with better quality habitat available to the species in the surrounding landscape. The removal of up to four potential nesting trees from within the subject land will not prohibit the species from accessing the surrounding landscape or fragment an existing important population into two or more populations.
Adversely affect habitat critical to the survival of a species	Potential	Conservation Advice for Southern Whiteface states habitat critical to the survival of the species includes areas that include (Commonwealth DCCEEW 2023b): <ul style="list-style-type: none"> • Relatively undisturbed open woodlands and shrublands with an understorey of grasses or shrubs, or both. • Habitat with low tree densities and an herbaceous understorey litter cover which provides essential foraging habitat • Living and dead trees with hollows and crevices which are essential for roosting and nesting. <p>The first category will not apply to the subject land, however the last two both may be considered to potentially be suited to the species. The subject land contains open eucalypt woodland with low tree density.</p> <p>This Conservation Advice notes that habitat critical to the survival of the species should not be cleared, fragmented or degraded and any likely habitat should be considered as critical habitat.</p> <p>The removal of 0.5368 ha of potential foraging habitat in the form of degraded grasslands and four trees potentially suited for nesting could potentially affect critical habitat. Therefore, the proposal, as outlined in the Conservation Advice, has the potential to have adverse effects on habitat critical to the survival of the species.</p>
Disrupt the breeding cycle of an important population	Unlikely	Southern Whiteface is highly opportunistic and will build their nest into a hole, crevice or hollow in tree, bush, fence post or building. Suitable hollows were observed within trees in the subject land; however, the proposal will not remove any hollow bearing tree. The proposal will require the removal up to four planted trees from within Vegetation Zone 4, which although do not contain hollows, the species may opportunistically build nests within a crevice between branches. However, considering available quality habitat within the surrounding landscape, and the retention of suitable hollows throughout the subject land, it is considered unlikely that the impacts of the proposed development will disrupt the breeding cycle of an important population of the species.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Unlikely	The proposed development will involve the removal of up to 0.5368 ha of degraded grassland habitat and up to four planted trees for nesting and dispersal habitat. This will subsequently result in a decrease in the availability of potential habitat for Southern Whiteface. While the proposal will reduce potential habitat at the local scale, the scale at which the development will remove potential habitat is relatively small in comparison to the relatively large area of habitat within NSW in which this species is known to occupy. The

		proposed removal of a small, predominantly degraded area of habitat is unlikely to have a significant impact on the species' population dynamics, and therefore, is not expected to contribute to a decline in species abundance.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Unlikely	The proposed development site is already disturbed, with invasive species observed within the area. The proposed development is not likely to result in further establishment of invasive species that are harmful to threatened species habitat, provided mitigation measures (Section 8.4) are undertaken during construction phase and future use of the site.
Introduce disease that may cause the species to decline	Unlikely	There is limited available information indicating the introduction of disease through clearing and construction works for developments that may impact Southern Whiteface. Furthermore, mitigation measures have been proposed to implement hygiene protocols minimising the potential for weeds and pathogens entering the subject land which are likely to significantly reduce the likelihood of disease entering the subject land. Therefore, it is unlikely that the development of the subject land would introduce diseases that may cause the species to decline.
Interfere substantially with the recovery of the species	Unlikely	<p>The Australian Government, DCCEEW (2023b) Conservation Advice presents recovery actions for this species to include but are not limited to the following actions:</p> <ul style="list-style-type: none"> • Cease all land clearing of habitat critical to the survival of Southern Whiteface. • Secure occupied habitat patches in areas where the birds have a patchy distribution from further degradation and loss. • Undertake revegetation, using a mix of locally appropriate native species, focussing on expanding and connecting areas of existing habitat or widening wildlife corridors. • Promote the uptake of agriculture and biodiversity stewardship programs to retain southern whiteface habitat. <p>The removal of 0.5368 ha of suitable habitat critical for the survival of Southern Whiteface (i.e. grassy woodland and up to four tree potentially utilised for nesting) does not align with the recovery actions to cease all land clearing of habitat critical for the survival of this species. However, considering the condition and extent of habitat the proposal seeks to remove, it is unlikely that it would interfere substantially with the recovery of the species.</p>

E2.2 SOUTH-EASTERN GLOSSY BLACK-COCKATOO (*CALYPTORHYNCHUS LATHAMI LATHAMI*)

South-eastern Glossy Black-Cockatoo is listed as Vulnerable under the EPBC Act, effective 10 August 2022. The species can be found from Mitchell, Queensland, through eastern New South Wales to East Gippsland, Victoria, however, although the South-eastern Glossy Black-Cockatoo is widespread it is uncommon. Distribution through NSW is continuous through forested parts of the Great Dividing Ranges but is scattered throughout the inland and as far west as the Riverina (Commonwealth DCCEEW, 2022b). The species almost exclusively feeds on the seeds of Sheoaks (*Allocasuarina* spp. and *Casuarina* spp.) and show a strong preference for individual feed trees. Furthermore, South-eastern Glossy Black-Cockatoo utilise large hollows for breeding, these hollows can be found in live or dead trees.

The species was not recorded during field survey, however, there are records for the species within 10 km of the subject land. The site is within the known geographic distribution for the species and contains potential breeding habitat for South-eastern Glossy Black-Cockatoo. Targeted surveys may be required to establish presence of this species within the subject land.

Following the Significant Impact Guidelines, if South-eastern Glossy Black-Cockatoo is present, the proposal is considered unlikely to have a significant impact as detailed below.

TABLE E 11: SOUTH-EASTERN GLOSSY BLACK-COCKATOO EPBC ACT SIGNIFICANT IMPACT ASSESSMENT

Significant impact criteria	Likelihood	Justification
Lead to a long-term decrease in the size of an important population of a species	Unlikely	<p>Most recent population estimates for the species suggest 7,500 (6,000 – 10,500) mature individuals, with a decreasing population (Commonwealth DCCEEW, 2022b).</p> <p>The proposal seeks to removal up to 0.5368 ha of modified grasslands, and up to four planted trees that do not contain hollows, neither of which provide suitable foraging or breeding habitat for the species. The proposal will not remove suitable hollow bearing trees that are present within the subject land. Due to the small number of overstory species being removed, the relatively small extent of degraded grassland foraging habitat to be removed and the available habitat with the subject land and surrounding landscape, it is considered unlikely that the proposal will lead to a long-term decrease in the size of an important population of a species.</p>
Reduce the area of occupancy of an important population	Unlikely	<p>South-eastern Glossy Black-Cockatoo's extent of occurrence (EOO) and area of occupancy (AOO) are estimated at 470,000 km² (range 447,000-493,500 km²) and 40,000 km² (21,000-80,000 km²) with both EOO and AOO trending as contracting (Commonwealth DCCEEW, 2022b).</p> <p>The subject land is within the known distribution for the species, however, there is no suitable foraging habitat for South-eastern Glossy Black-Cockatoo present. The subject land does have suitable hollow bearing trees containing hollows of suitable characteristic for the species' breeding habitat, furthermore, this habitat will be retained. Therefore, as the proposal does not seek to remove any foraging or breeding habitat for the species it is considered unlikely to cause a reduction in the area of occupancy of an important population.</p>
Fragment an existing important population into two or more populations	Unlikely	<p>The proposal will not remove any suitable foraging habitat and will preserve potential breeding habitat present within the subject land. As such, the proposal is unlikely to fragment an existing important population into two or more populations.</p>
Adversely affect habitat critical to the survival of a species	Unlikely	<p>Habitat critical to the survival of South-eastern Glossy Black-Cockatoo is outlined in the Conservation Advice by Commonwealth DCCEEW (2022b) as:</p> <ul style="list-style-type: none"> • 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

		<p>to the survival of the species or ecological community, such as pollinators);</p> <ul style="list-style-type: none"> to maintain genetic diversity and long-term evolutionary development; or for the reintroduction of populations or recovery of the species or ecological community. <p>The proposal involves the removal of 0.5368 ha of modified grasslands and up to four planted trees, neither of which provide suitable foraging or breeding habitat for South-eastern Glossy Black-Cockatoo. However, the proposal will retain suitable hollow-bearing trees within Vegetation Zone 1, which are critical for the species' survival. Therefore, it is unlikely that the proposal will have an adverse effect on habitat critical to the survival of the species.</p>
Disrupt the breeding cycle of an important population	Unlikely	<p>South-eastern Glossy Black-Cockatoo often nest in central NSW in large hollows found in Narrow-leaved Ironbark (<i>Eucalyptus crebra</i>), Blue-leaved ironbark (<i>E. nubila</i>) and Blakely's Red Gum (Cameron, 2006). Hollows are found to be 8 m above the ground and have a diameter of greater than 20 cm.</p> <p>The proposal does not seek to removal any potential hollow bearing trees from within the subject land, therefore, it is considered unlikely that the proposed development would disrupt the breeding cycle of an important population.</p>
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Unlikely	<p>The proposal is not likely to modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline, as the proposed development does not seek to impact suitable foraging or breeding habitat. The proposal will implement mitigation measures (as outlined in Section 8.4) to exclude and protect hollow bearing trees present within the subject land.</p>
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Unlikely	<p>The proposal seeks to alter 0.5368 ha of moderately disturbed land which already contains a variety of weedy species. Invasive fauna species such as European Fox were recorded during surveys, and as such have already been introduced. Provided mitigations measures (outlined in Section Error! Reference source not found.) are followed, the proposal is not likely to increase the number of invasive species within potential habitat areas.</p>
Introduce disease that may cause the species to decline	Unlikely	<p>The above species are susceptible to Psittacine beak and feather disease (Pbfd). It is unknown if populations of the species carry the disease in the region. However, it is unlikely that the proposed development would further introduce this disease to the species population as the disease is transmitted through feather dander, faeces, and saliva, which is unlikely to be introduced in development works.</p>
Interfere substantially with the recovery of the species	Unlikely	<p>Recovery actions as outline in the species' Conservation Advice includes:</p> <ul style="list-style-type: none"> Protect, enhance extent and quality of habitat across the subspecies' range, and Protect, restore and enhance the quality of known suitable habitat and increase the extent of habitat (both breeding and foraging) for south-eastern glossy black cockatoo across the subspecies' range (both current and future) to maintain viability in response to threats, including climate change. <p>The subject land contains open grassy woodland and modified grasslands, of which there is suitable breeding habitat in the form of hollow bearing trees. The proposal does not seek to remove any potential breeding habitat available to the species, however, it seeks to remove 0.5368 ha of modified grasslands, and up to four planted trees that do not contain hollows. This habitat may be utilised for dispersal, however, would not be characterised as critical habitat for the species. Therefore, it is considered unlikely that the proposal would interfere substantially with the recovery of the species.</p>

E2.3 WHITE-THROATED NEEDLETAIL (*HIRUNDAPUS CAUDACUTUS*)

The White-throated Needle-tail is a large swift which is generally gregarious when in Australia, often being seen in large flocks, not only with others of its own species, but also with Fork-tailed Swifts (*Apus pacificus*) and Fairy Martins (*Hirundo ariel*). It is listed as Vulnerable under the EPBC act as of 4 July 2019, as well as Migratory. They are a mostly aerial species, flying at heights from less than 1 m to up to 1000 m above the ground, often above wooded areas, and occasionally above farmland, where they tend to fly above partly cleared pasture, plantations or remnant vegetation. White-throated Needle-tail does not breed in Australia.

The species was not observed during survey of the subject area, although there are records within 10 km and some suitable foraging habitat is present.

Following the Significant Impact Guidelines, it is considered unlikely that the proposal will have a significant impact on the White-throated Needle-tail.

TABLE E 12: WHITE-THROATED NEEDLETAIL EPBC ACT SIGNIFICANT IMPACT ASSESSMENT

Significant impact criteria	Likelihood	Justification
Lead to a long-term decrease in the size of an important population of a species	Unlikely	The proposal seeks to remove up to 0.5368 ha of grassland and up to four trees, which provides some marginal habitat above which the White-throated Needle-tail may forage. As the species is almost exclusively aerial and there is greater availability of habitat in the surrounding landscape, the proposal is considered unlikely to lead to a long-term decrease in the size of an important population of the species.
Reduce the area of occupancy of an important population	Unlikely	The area of occupancy for White-throated Needle-tail is estimated, when within Australia, at greater than 18,000 km ² (DCCEEW, 2019). The small size of the proposed clearing combined with the aerial nature of this species make it unlikely that the proposal will reduce the area of occupancy of an important population of the species.
Fragment an existing important population into two or more populations	Unlikely	Important populations of this species are not defined in government publications; however, the species is unlikely to utilise the subject area, and as such, the proposal is considered unlikely to fragment an existing important population into two or more populations.
Adversely affect habitat critical to the survival of a species	Unlikely	Habitat critical to the survival of the species has not been defined in the Conservation Advice for the White-throated Needle-tail. The species seems to prefer foraging above woodland, occasionally utilising open spaces above farmland where there are trees nearby. As the proposal seeks to remove only four trees and up to 0.5368 ha of grassland, it is considered unlikely to adversely affect habitat critical to the survival of the species.
Disrupt the breeding cycle of an important population	Unlikely	The White-throated Needle-tail does not breed in Australia. As such, the proposal is considered unlikely to disrupt the breeding cycle of an important population.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Unlikely	The proposal seeks to clear up to 0.5368 ha of grassland and up to four trees, which the White-throated Needle-tail may forage above but will likely not utilise directly. As such, the proposal is considered unlikely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Unlikely	The subject land is moderately disturbed with multiple invasive fauna observed and contains several invasive weed species. The proposed action is not likely to result in further establishment of invasive species that are harmful to endangered species habitat provided mitigation measures (Section 8.4) are undertaken during the construction phase and monitoring and maintenance of any weed incursions are undertaken during future use of the subject land.
Introduce disease that may cause the species to decline	Unlikely	There is limited available information indicating the introduction of disease through clearing and construction works for developments

		that may impact White-throated Needletail. Furthermore, mitigation measures have been proposed to implement hygiene protocols minimising the potential for weeds and pathogens entering the subject land which are likely to significantly reduce the likelihood of disease entering the subject land. Therefore, it is unlikely that the development of the subject land would introduce diseases that may cause the species to decline.
Interfere substantially with the recovery of the species	Unlikely	As White-throated Needletail is a predominantly aerial species as unlikely to utilise the subject area directly, the proposal is considered unlikely to interfere substantially with the recovery of the species.

E2.4 SUPERB PARROT (*POLYTELIS SWAINSONI*)

Superb Parrot was listed as Vulnerable effective 16 July 2000. The species generally only occurs in south-eastern Australia. The species is present in NSW and northern Victoria where it is present on the inland slopes of the Great Divide and adjacent plains, particularly along major river systems. Species vagrants have also been recorded in Queensland. The species mainly inhabits Box-Gum, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest (Commonwealth DCCEEW, 2021b).

The species' nesting sites are often present in extensive patches of suitable foraging habitat. In the Murray-Riverina nesting sites are not usually located more than 10 km away from foraging resources (Webster, 1998). They nest in the hollows of large trees (dead or alive).

Superb Parrot was not observed during field surveys outlined in **Section 2**. The species was detected during field surveys conducted by NGH (2018) within the Gregadoo Solar Farm approved footprint, this location is just outside of the subject land. Also, the presence of local records and potential utilizable habitat suggests that the species may use the subject land on occasion in the future.

The species is likely to be found utilizing the subject land as Wagga Wagga and the Murrumbidgee River is considered a Key Biodiversity Area for the species, furthermore, Wagga Wagga falls within the large South-west Slopes Key Biodiversity Area for the species (DAWE, 2021). Therefore, Superb Parrot found within the subject land would fall within the classification as being a part of an important population.

Following the Significant Impact Guidelines, the proposal has is unlikely to have a significant impact on Superb Parrot as detailed in the table below.

TABLE E 13: SUPERB PARROT EPBC ACT SIGNIFICANT IMPACT ASSESSMENT

Significant impact criteria	Likelihood	Justification
Lead to a long-term decrease in the size of an important population of a species	Unlikely	Important populations for the Superb Parrot have not been defined in the National Recovery Plan. However, the most recent population estimate for Superb Parrot is 20,00 mature individuals (range 6,500 – 100,000), with a stable trend (Garnet & Baker, 2021). Due to the species' low number, which has seen a recovery in recent years, all populations might be considered important. The species has three main breeding areas, with the subject land close to the area of the Murrumbidgee River breeding population between Wagga Wagga and Toganmain Station (DAWE, 2021). The proposed development would remove 0.5368 ha of degraded grassland that may be utilised by this species for foraging and up to four planted trees without hollows. Habitat features present in the subject land will be retained through the proposal. Therefore, the proposed development is not likely to lead to a long-term decrease in the size of an important population of a species as the current extent of habitat trees and trees will not be reduced within the subject land.
Reduce the area of occupancy of an important population	Unlikely	Superb Parrots are partial migrants, which can exhibit a large seasonal migration into northern NSW outside of the breeding season. The EOO for the species is estimated to be 300,000 km ² (range 270,000 km ² – 320,000 km ²) and an AOO of 7,900 km ² (range 5360 – 10,000 km ²), both trending stable (Garnet & Baker, 2021). Therefore, the proposed development is not likely to reduce the area of occupancy of an important Superb Parrot population.
Fragment an existing important population into two or more populations	Unlikely	Important populations for the Superb Parrots have not been defined in the National Recovery Plan. However, Key Biodiversity Areas (KBA) have been identified for the species including the Barmah-Millewa River Red Gum (<i>Eucalyptus camaldulensis</i>) forests of Victoria and NSW, Murrumbidgee Red Gums, consisting of two stretches of the Murrumbidgee River, and the South-west Slopes of New South Wales with a core 80 km-wide length of the inland slopes of the Great Dividing Range from Wagga Wagga to Orange, extending south-east through Boorowa and Yass to Queanbeyan (Saunders & Tzaros, 2011). Superb Parrot appears to be highly mobile and exhibits some seasonal migratory behaviours, typically strongly positively associated with

		foraging opportunities. The proposal requires the require the removal of up to four planted trees with no association to Box Gum Woodland or River Red Gums forests from the subject land. These trees do not contain suitable breeding habitat features for the species but may provide minimal foraging opportunities. The removal of these trees and 0.5368 ha of degraded grassland is considered unlikely to fragment an existing population. Therefore, the proposed development is unlikely to affect this species' ability to access other important populations.
Adversely affect habitat critical to the survival of a species	Unlikely	<p>DAWE (2021) National Recovery Plan for Superb Parrot states that habitat critical to the survival of the species is divided broadly into their breeding habitat, foraging habitat, and habitat for long-term maintenance of the species:</p> <ul style="list-style-type: none"> • Breeding habitat: riverine forests in the Riverina, and box-gum woodlands in the tablelands and slopes of Victoria, NSW and ACT (also see KBA). • Foraging habitat: All preferred foraging habitat during both breeding and non-breeding season (excluding exotic feeding grounds). • Habitat for the long-term maintenance of the species: Any potentially suitable foraging and breeding habitats within the projected south-eastward range shift. <p>The subject land potentially falls into all three categories. However, the proposal will lead to the removal of 0.5368 ha of degraded grassland habitat that may be utilised for foraging, and up to four planted trees that may provide some foraging habitat but is does not contain breeding habitat. Therefore, the proposal, as outlined in the National Recovery Plan, will require the removal of potential foraging habitats that may be considered habitat critical to the survival of the species. Therefore, the proposal has the potential to adversely affect habitat critical to the survival of Superb Parrot.</p>
Disrupt the breeding cycle of an important population	Unlikely	<p>Superb Parrot nest between September and December in breeding habitat that has a particular reliance on box-gum tree species for hollows, particularly Blakely's Red Gum, and an assumed reliance on Yellow Box (Rayner <i>et al.</i>, 2016). The species also nest in semi-urban environments where large older trees have been retained (i.e. Canberra, Orange). Mature hollow-bearing trees suitable for nesting were recorded in the subject land and surrounding landscape, however, were not observed to be utilised by this species at the time of inspection.</p> <p>The proposed development will require the removal of up to four planted trees from within Vegetation Zone 4 that do not have hollows. The subject land is located ~ 1.3 km south of an area mapped as an important breeding area (KBAs). Despite this, the proposal does not require the removal of potential nesting habitat or foraging trees, and therefore it is unlikely that the removal of potential foraging habitat within the subject land will disrupt the breeding cycle of an important population.</p>
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Unlikely	<p>The proposed development will involve removal of up to 0.5368 ha of degraded grassland habitat and up to four planted trees potentially utilised for foraging. This will subsequently result in a decrease in the availability of potential foraging habitat for Superb Parrot. While the proposal will reduce potential foraging habitat at the local scale, the scale of which the development will remove potential habitat is relatively small in comparison to due to the relatively large area of potential habitat retained and undisturbed within the subject land, as well as grassland and grassy woodland retained within NSW in which this species is known to occupy. It is considered unlikely that the proposal and its outlined impacts could cause the significant decline of the species.</p>
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Unlikely	<p>The subject land is moderately disturbed with multiple invasive fauna species observed and contains several invasive weed species. The proposed action is not likely to result in further establishment of invasive species that are harmful to endangered species habitat provided mitigation measures (Section 8.4) are undertaken during the construction phase and monitoring and maintenance of any weed incursions are undertaken during future use of the subject land.</p>

Introduce disease that may cause the species to decline	Unlikely	<p>Superb Parrots are susceptible to Psittacine beak and feather disease (PBFD). While PBFD is known to occur in Swift Parrots in the wild and captive birds, the prevalence and pathogenicity of the disease is currently not known.</p> <p>However, it is unlikely that the proposed development would further introduce this disease to the species population as the disease is transmitted through feather dander, faeces, and saliva, which is unlikely to be introduced in development works.</p>
Interfere substantially with the recovery of the species	Unlikely	<p>Commonwealth DCCEEW (2021b) National Recovery Plan for the Superb Parrot includes, but are not limited to the following actions:</p> <ul style="list-style-type: none"> • Identify areas of high conservation significance and habitat critical to the survival of Superb Parrot. • Protect and manage areas of 'habitat critical to the survival' not currently managed for nature conservation. • Restore existing and future Superb Parrot habitat in strategic locations close to, and within key sites and known movement corridors. • Develop agreements with priority local government and government agencies that aim to maintain and enhance Superb Parrot breeding and foraging habitat. • Incorporate Superb Parrot conservation priorities into covenanting and other private land conservation programs. <p>Within the recovery plan key considerations for environmental impact assessments notes that:</p> <p><i>'Actions should not be assessed in isolation and consideration must be given to existing and future activities that may impact the species to ensure conservation outcomes on a landscape scale are achieved.'</i></p> <p>Local records and the locality of important breeding area (KBAs) suggest that the subject land is likely utilised by Superb Parrot. Despite this, habitats proposed for removal are not considered critical to the survival of this species as outlined in the National Recovery Plan. Therefore, the removal of up to 0.5368 ha of degraded grassland and up to four trees that may provide foraging habitat is not considered likely to interfere substantially with the recovery of this species.</p>

E2.5 GREY-HEADED FLYING-FOX (*PTEROPUS POLIOCEPHALUS*)

Grey-headed Flying-fox is listed as Vulnerable under the EPBC Act, effective 31 March 2023. This species is the largest bat in Australia, generally found within 200 km of the east coast, extending from Rockhampton in Queensland to Adelaide in South Australia. The species roosts communally in large camps often located in a gully close to water under dense canopy cover. They typically inhabit subtropical and temperate rainforests, tall sclerophyll forests and woodlands, swamps, heaths, and further at times occupying urban areas and cultivated fruit crops. They are known to travel 20 – 50 km when foraging, with a home range of ~785,000 ha. Favourite food plants include flowering native trees (*Eucalyptus*, *Melaleuca* and *Banksia*), fruiting rainforest trees and vines, urban gardens, and cultivated fruit crops.

Although the species was not recorded during surveys, it has the potential to utilize the subject land for foraging. There are also numerous records within 10 km of the subject area.

Following the Significant Impact Guidelines, the proposal is unlikely to have a significant impact on Grey-headed Flying-fox as detailed in the table below.

TABLE E 14: GREY-HEADED FLYING-FOX EPBC ACT SIGNIFICANT IMPACT ASSESSMENT

Significant impact criteria	Likelihood	Justification
Lead to a long-term decrease in the size of an important population of a species	Unlikely	<p>Important populations in the form of nationally important camps have been identified, of which 75 of the 418 Grey-headed Flying-fox camps known are currently recognised as nationally important camps. One camp has been identified within Parkes at Kelly Road; however, it is not considered nationally important, and no camps occur within the subject land or immediate vicinity.</p> <p>The extent of foraging habitat remaining in the surrounding area after the proposed development would likely provide sufficient foraging resources to sustain future visitation, such that the proposal is unlikely to lead to a long-term decrease in the size of the Grey-headed Flying-fox population.</p>
Reduce the area of occupancy of an important population	Unlikely	<p>The area of occupancy for Grey-headed Flying-fox has not been defined in the government Recovery Plan; however, for the same reasons above, the proposal is not likely to reduce the area of occupancy of an important population.</p>
Fragment an existing important population into two or more populations	Unlikely	<p>Due to the species being able to travel up to 100 km in one night and being known to occupy and disperse through urban environments, disturbances associated with the proposal are not considered barriers to the dispersal of this species. As such, it is considered unlikely to fragment an existing important population into two or more populations.</p>
Adversely affect habitat critical to the survival of a species	Unlikely	<p>Habitat critical to the survival of the Grey-headed Flying-fox is considered to be vegetation communities containing important winter and spring flowering plants. These include but are not limited to Eucalyptus species, which are present within the subject area, four of which will be impacted by the proposal.</p> <p>The proposal, given the small scale of impact, is considered unlikely to affect habitat critical to the survival of a species through removal of important feed trees.</p>
Disrupt the breeding cycle of an important population	Unlikely	<p>It is unlikely that the proposal would disrupt the breeding cycle of an important population as breeding is unlikely to occur within the subject land, and no breeding colonies or camps were observed.</p>
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Unlikely	<p>It is considered unlikely that the proposal will lead to broader species decline, due to the sub-optimal quality of the habitat within the subject area and the availability of higher-quality habitat in the surrounding landscape.</p>
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Unlikely	<p>The subject area already contains a variety of weedy species. Invasive fauna species were recorded during surveys, and as such have already been introduced. Provided mitigations measures (outlined in Section Error! Reference source not found.) are followed, the proposal is not likely to increase the number of invasive species within potential habitat areas.</p>

Introduce disease that may cause the species to decline	Unlikely	No diseases are currently known as transferable from humans to the species as a result of direct activities. As such, it is considered unlikely that the proposal will result in the introduction of disease which may cause the species to decline.
Interfere substantially with the recovery of the species	Unlikely	<p>A national recovery plan for the Grey-headed Flying-fox has been produced to set out the management and research actions necessary to stop the decline of and support the recovery of the species over the next 10 years (DCCEEW, 2021a).</p> <p>The proposal is unlikely to directly or indirectly interfere with the recovery of Grey-headed Flying-fox on a national or local scale due to small-scale proposed impact and the dispersal ability of the species.</p>

E2.6 DIAMOND FIRETAIL (*STAGONOPLEURA GUTTATA*)

Diamond Firetail is listed as Vulnerable under the EPBC Act, effective 31 March 2023. The species is endemic to south-eastern Australia, its distribution extending from central Queensland to the Eyre Peninsula in South Australia. It's widely distributed within NSW, with a concentration of records published through the Northern, Central and Southern Tablelands, Riverina, and Northern, Central and South Western Slopes (DCCEEW, 2023e). It is a distinctive ground-feeding bird found in grasslands and grassy eucalyptus woodlands, riparian areas, and sometimes lightly wooded farmland. The species has been recorded in some towns and near farmhouses. The species' nests are globular structures built in either a shrubby understory or taller sheltered trees.

No evidence of the species was recorded within the study area during field surveys however, suitable foraging and some potential roosting habitat is present, and there are several records within 10 km. The presence of local records and suitable habitat suggests that the species is likely to use the study area.

Following the Significant Impact Guidelines, the proposal has some potential to have a significant impact on Diamond Firetail as detailed in the table below.

TABLE E 15: DIAMOND FIRETAIL EPBC ACT SIGNIFICANT IMPACT ASSESSMENT

Significant impact criteria	Likelihood	Justification
Lead to a long-term decrease in the size of an important population of a species	Unlikely	An important population is not defined in the Australian Government, DCCEEW Advice and Listing Assessment. However, as there are currently considered to be approximately only 136,000 (68,000 – 272,000, low reliability) mature individuals left in Australia with a decline trend (Garnet & Baker, 2021), all populations are important. The subject land contains areas of moderate quality foraging and nesting habitat for Diamond Firetail, which predominantly forage on the ground, preferably in longer grass for seeds and insects (Payne, 2020). The removal of up to 0.5368 ha of degraded grassland and up to four planted trees within the subject land will reduce potential foraging habitat for the species. However, the proposed development is not likely to lead to a long-term decrease in the size of an important population of a species as habitat trees or suitable breeding habitat for the species will not be removed from within the subject land.
Reduce the area of occupancy of an important population	Unlikely	Reporting rate trends listed in the Conservation Advice, across Diamond Firetail's range indicate a continuing rapid decline in the population size of 30 - 50% over the last ten years, with a high probability of continued decline as the causes of decline have not ceased. The EOO is estimated at 1,500,000 km ² (range 1,400,000 - 1,600,000 km ²), and the AOO is estimated at 25,000 km ² (range 12,500-50,000 km ²) (Garnet & Baker, 2021). Both the EOO and AOO have contracting trends suggesting local declines. The underlying reason for the decline of the species is the clearance of native vegetation for large scale agriculture which has reduced the size and quality of important nesting and breeding habitats. The study area only contains a small amount of suboptimal foraging habitat and no suitable breeding habitat for Diamond Firetail. While the species is known to occur within close proximity of the study area, it is unlikely to support an important population of the species. As such, the removal of up to 0.5368 ha of degraded grassland is unlikely to reduce the area of occupancy of an important population of Diamond Firetail.
Fragment an existing important population into two or more populations	Unlikely	Diamond Firetail is believed to be a sedentary bird species that does not undertake migratory behaviours. The population distribution is not considered to be severely fragmented (Hodder <i>et al.</i> , 2021). The proposed development will remove 0.5368 ha of degraded grassland habitat and up to four planted trees that are not considered important for connectivity for this species. Development of the site will not reduce breeding or nesting habitat, prohibit the

		species from moving around and accessing the surrounding landscape or impede movement between existing populations.
Adversely affect habitat critical to the survival of a species	Potential	<p>Habitat critical to the survival of Diamond Firetail has been described by the Commonwealth DCCEEW (2023e) to include areas of:</p> <ul style="list-style-type: none"> • Eucalypt, acacia or casuarina woodlands, open forests and other lightly timbered habitats, • low tree density, few large logs, and little litter cover but high grass cover for foraging, roosting and breeding, • Drooping She-oak (<i>Allocasuarina verticillata</i>) within the Mt Lofty Ranges. <p>The third category does not apply to the subject land, however the first two are considered to potentially be suited to the species. The subject land contains open eucalypt woodland with low tree density; however, currently high grass cover may not be applicable to the area due to current agricultural grazing.</p> <p>This Conservation Advice notes that habitat critical to the survival of the species (i.e. eucalypt woodland) should not be cleared, fragmented, or degraded and any likely habitat should be considered as critical habitat. The removal of 0.5368 ha of potential foraging habitat in the form of degraded grasslands does not conflict with Conservation Advice, however, the clearing of up to four trees from eucalypt woodland from Vegetation Zone 4 does. Therefore, the proposal, as outlined in the Conservation Advice, has the potential to adversely affect habitat critical to the survival of the species.</p>
Disrupt the breeding cycle of an important population	Unlikely	<p>Diamond Firetail often build their nests into the base of large stick-nests of birds of prey, or amongst prickly shrubs, either native or exotic species, such as hakeas or boxthorns (Commonwealth DCCEEW, 2023e).</p> <p>During surveys no suitable nesting sites, large stick-nests of birds of prey or prickly shrubs were observed in the subject land. As the proposal will not remove or reduce the number of nesting sites present across the subject land, it is considered unlikely that the impacts of the proposed development will disrupt the breeding cycle of an important population of the species.</p>
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Unlikely	<p>The conservation advice describes historical and ongoing clearing of native vegetation as the main reason for the decline of the Diamond Firetail. The widespread degradation of remaining habitat has also led to the replacement of native perennial grasses with exotic annual grasses which further reduces food availability for the species. The proposed development will require the removal of up to 0.5368 ha of already modified and degraded grassland. It is unlikely that the removal of such habitat within the subject land's extent will lead the likely decline of the species.</p>
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Unlikely	<p>The subject land is already disturbed, with invasive fauna species observed and weed species present. The proposed development is not likely to result in further establishment of invasive species that are harmful to threatened species habitat, provided mitigation measures (Section 8.4) are undertaken during construction phase and future use of the site.</p>
Introduce disease that may cause the species to decline	Unlikely	<p>There is limited available information indicating the introduction of disease through clearing and construction works for developments that may impact Diamond Firetail. Furthermore, mitigation measures have been proposed to implement hygiene protocols, which would minimise the potential for weeds, pathogens and disease to enter the subject land. Therefore, it is unlikely that the development of the subject land would introduce diseases that may cause the species to decline.</p>
Interfere substantially with the recovery of the species	Unlikely	<p>The species was listed as vulnerable under the EPBC Act in March 2023. While a Recovery Plan is currently not available, DCCEEW highlight the requirement for an adopted plan:</p>

*“The threats facing the entity, and the recovery actions needed can most effectively be guided via an approved Recovery Plan for the species. The species is affected by serious threats, most notably habitat loss, degradation, fragmentation and removal, climate change, predation from invasive species, invasive weeds, firewood collection and competition with Noisy Miners (*Manorina melanocephala*). The entity has complex jurisdictional, land tenure and land manager situations, complex and multiple threats that vary in severity across their ranges and multiple conservation planning resources required to develop the plan, that require national, as well as local coordination with multiple stakeholders and complex recovery actions”*

The project would contribute to threats to the species through the loss of 0.5368 ha. foraging habitat, which does not align with recovery actions for this species. However, given the extent and condition of habitat to be removed, it is unlikely that it would interfere substantially with the recovery of the species.

E2.7 GOLDEN SUN MOTH (*SYNEMON PLANA*)

Golden Sun Moth is listed as Vulnerable under the EPBC Act, effective 7 December 2021. It is a medium sized, day-flying moth in the family Castniidae, which has green eyes, clubbed antennae, and no functional mouth parts. Females have a long ovipositor, which they use to lay eggs at the base of Wallaby Grass (*Rytidosperma* spp.) tussocks. The larvae develop and pupate underground at the base of tussocks. Males and females of the species exhibit different colouration, with the females having an orange hind wing, while both species have a dark and pale grey patterned forewing.

Golden Sun Moth inhabit grasslands in which their preferred Wallaby Grass is present, particularly native grasslands, open grassy woodlands, and secondary grasslands. This includes degraded habitats containing weedy species such as Chilean Needle Grass (*Nassella neesiana*), which the species has been known to feed on in its larval form (DEWHA, 2009).

This species was not recorded within the subject area and has not been recorded within 10 km of the site; however, there is some potential habitat within the subject area. The proposal seeks to clear up to 0.5368 ha of potential habitat, and as such, if this species is determined to be present, following the Significant Impact Guidelines, there is potential for the proposed development to have a significant impact.

TABLE E 16: GOLDEN SUN MOTH EPBC ACT SIGNIFICANT IMPACT ASSESSMENT

Significant impact criteria	Likelihood	Justification
Lead to a long-term decrease in the size of an important population of a species	Unlikely	The proposal seeks to clear up to 0.5368 ha of grassland containing minor occurrences of Wallaby Grasses. Although surveys did not detect the species, targeted surveys during spring or summer months are required to determine the presence of this species. However, given to minor cover in Wallaby Grasses and the available habitat in the surrounding landscape, the proposed clearing of mostly modified grassland is considered unlikely to lead to a long-term decrease in the size of a population of Golden Sun Moth.
Reduce the area of occupancy of an important population	Unlikely	The area of occupancy for Golden Sun Moth is described in government Conservation Advice as approximately 1596 km ² . While targeted surveys for this species have not been conducted, given the available habitat and its largely modified nature, this species is considered unlikely to rely on the subject land for habitat but may utilise features on a transient basis. The subject area contains very minor suboptimal habitat, of which up to 0.5368 ha will be cleared. Furthermore, the scale of clearing for the proposal is minor, and the removal of this suboptimal habitat is considered unlikely to reduce the area of occupancy of an important population.
Fragment an existing important population into two or more populations	Unlikely	Golden Sun Moth occurs in approximately 104 sites in Victoria (F Douglas, pers comm. 2020), at least 59 sites in NSW (Gibbons and Reid, 2013), and 78 sites in the ACT (ACT Government, 2017). The species is considered to be severely fragmented, with genetic differences noted across separate populations (Clarke & O'Dwyer 2000). As such, all populations of this species are considered to be important. The subject area contains suboptimal habitat for the species, containing only minor occurrences of Wallaby Grasses. Despite this, targeted surveys would be required to determine its presence within the subject land. The proposal seeks to clear up to 0.5368 ha of suboptimal habitat which is considered unlikely to fragment an existing important population into two or more populations given the retained habitat within the subject land and surrounding landscape.

Adversely affect habitat critical to the survival of a species	Unlikely	<p>Habitat critical to the survival of Golden Sun Moth is described in the government conservation advice (DCCEEW, 2021) as areas that are necessary:</p> <ul style="list-style-type: none"> • For activities such as foraging, breeding, roosting or dispersal, • for the long-term maintenance of the species (including the maintenance essential to the survival of the species, such as pollinators), • to maintain genetic diversity and long-term evolutionary development, or • for the reintroduction of populations or recovery of the species. <p>As the proposal seeks to clear up to 0.5368 ha of mostly suboptimal modified grassland habitat that is considered not to form critical habitat for this species. It is considered unlikely that the proposal will adversely affect habitat critical to the survival of the species.</p>
Disrupt the breeding cycle of an important population	Unlikely	<p>Breeding of the Golden Sun Moth occurs in summer on warm days above 20°C. Males fly low to the ground, searching for the almost flightless females, who position themselves near tussocks and display their orange hind wings. This occurs in open, nearly treeless grassland. Males are not capable of flying long distances, and generally travel no further than 100m from areas of suitable habitat. As such, the removal of up to 0.5368 ha of mostly modified suboptimal grassland is considered unlikely to disrupt the breeding cycle of an important population of Golden Sun Moth. Furthermore, no records of this species are present in the surrounding landscape which suggests the absence of an important population within or directly surrounding the subject land.</p>
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Unlikely	<p>Golden Sun Moth has a wide known and predicted distribution range, with a large number of known sites of occurrence. Although the species is listed as Vulnerable, the true number of individuals remaining is unknown due to difficulties in surveying. No species records occur for the surrounding landscape. The removal of up to 0.5368 ha of mostly modified suboptimal grassland is considered unlikely to lead to the modification, destruction, removal, isolation or decreased availability or quality of habitat to the extent that the species is likely to decline.</p>
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Unlikely	<p>The proposal seeks to alter 0.5368 ha of mostly modified suboptimal grassland and planted vegetation which already contains a variety of weedy species. Invasive fauna species such as European Fox were recorded during surveys, and as such have already been introduced. Provided mitigation measures (outlined in Section Error! Reference source not found.) are followed, the proposal is not likely to increase the number of invasive species to the subject land.</p>
Introduce disease that may cause the species to decline	Unlikely	<p>There is limited available information indicating the introduction of disease through clearing and construction works for developments may impact the Golden Sun Moth. Furthermore, mitigation measures have been proposed to implement hygiene protocols minimising the potential for weeds and pathogens entering the subject land which are likely to significantly reduce the likelihood of disease entering the subject land. Therefore, it is unlikely that the proposal would introduce disease that may cause the species to decline.</p>
Interfere substantially with the recovery of the species	Potential	<p>The proposal seeks to clear up to 0.5368 ha of mostly modified suboptimal grassland which is considered unlikely to be utilised as habitat by this species. It may, however, offer usability to this species on a transient basis. Although the species was not observed during surveys, targeted surveys would be required to determine the presence of Golden Sun Moth. Should it be present, the clearing of habitat, although a small amount, has the potential to interfere substantially with the recovery of the species if it is found to rely on the present habitat for usage beyond a transient basis.</p>

E3 Listed migratory species

An action is likely to have a significant impact on a migratory species if there is a real chance or 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
- 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
- seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.

E3.1 FORK-TAILED SWIFT (*APUS PACIFICUS*)

Fork-tailed Swift is a non-breeding visitor to all states and territories of Australia. Within NSW, Fork-tailed Swift is recorded in all regions, with many records occurring east of the Great Divide; however, a few populations have been found to the west. The species is almost exclusively aerial, flying from less than 1 m to at least 300 m above ground, and probably much higher above well-watered open grassland and the fringes of wetlands. It lands only occasionally where it nests on mountain cliffs and cliff faces outside of Australia.

The Referral guidelines for 14 birds listed as migratory species under the EPBC Act states important habitat for Fork-tailed Swift as (DE, 2015):

“Non-breeding habitat only: monsoonal rainforest, vine thickets, wet sclerophyll forest or open Casuarina, Acacia or Eucalyptus woodlands. Frequently at edges or ecotones between habitat types. Riparian forest is favoured habitat in the Kimberley region.”

This species was not observed during studies of the subject land, but there are records within 10 km and the species may forage above the subject land. Following the Significant Impact Guidelines, it is considered unlikely that this proposal will have a serious impact on the Fork-tailed Swift.

TABLE E 17: FORK-TAILED SWIFT (MIGRATORY) EPBC ACT SIGNIFICANT IMPACT ASSESSMENT

Significant impact criteria	Likelihood	Justification
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	Unlikely	The proposed development will require the removal of up to 0.5368 ha of grassland and up to four trees from the subject land. This habitat is unlikely to be used by the Fork-tailed Swift, but the species may forage above it. As such, the proposal is considered unlikely to substantially modify, destroy, or isolate an area of important habitat for this migratory species.
Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species	Unlikely	The proposal seeks to alter 0.5368 ha of modified grassland and planted vegetation which already contains a variety of weedy species. Invasive fauna species such as European Fox were recorded during surveys, and as such have already been introduced. Provided mitigation measures (outlined in Section Error! Reference source not found.) are followed, the proposal is not likely to increase the number of invasive species to the subject land.
Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.	Unlikely	The proposed development will require the removal of up to 0.5368 ha of grassland and up to 4 trees. This habitat is not considered suitable for the species, and as such, would be unlikely to be utilised, though the species may forage above the subject area. As such, the proposal is considered unlikely to seriously disrupt an ecologically significant proportion of a population.

E3.2 WHITE-THROATED NEEDLETAIL (*HIRUNDAPUS CAUDACUTUS*)

The White-throated Needle-tail is a large swift which is generally gregarious when in Australia, often being seen in large flocks, not only with others of its own species, but also with Fork-tailed Swifts (*Apus pacificus*) and Fairy Martins (*Petrochelidon ariel*). It is listed as Vulnerable under the EPBC act as of 4 July 2019, as well as Migratory. They are a mostly aerial species, flying at heights from less than 1 m to up to 1000 m above the ground, often above wooded areas, and occasionally above farmland, where they tend to fly above partly cleared pasture, plantations or remnant vegetation. White-throated Needle-tail does not breed in Australia.

The species was not observed during survey of the subject area, although there are records within 10 km and some suitable foraging habitat is present. Following the Significant Impact Guidelines, it is considered unlikely that the proposal will have a significant impact on the White-throated Needle-tail.

TABLE E 18: WHITE-THROATED NEEDLETAIL (MIGRATORY) EPBC ACT SIGNIFICANT IMPACT ASSESSMENT

Significant impact criteria	Likelihood	Justification
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	Unlikely	The proposed development will require the removal of up to 0.5368 ha of grassland and up to four trees from the subject land. This habitat is unlikely to be used by White-throated Needle-tail, but the species may forage above it. As such, the proposal is considered unlikely to substantially modify, destroy, or isolate an area of important habitat for this migratory species.
Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species	Unlikely	The proposal seeks to alter 0.5368 ha of modified grassland and planted vegetation which already contains a variety of weedy species. Invasive fauna species such as European Fox were recorded during surveys, and as such have already been introduced. Provided mitigation measures (outlined in Section Error! Reference source not found.) are followed, the proposal is not likely to increase the number of invasive species to the subject land.
Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.	Unlikely	The proposed development will require the removal of up to 0.5368 ha of grassland and up to 4 trees. This habitat is not considered suitable for the White-throated Needle-tail, and as such, would be unlikely to be utilised, though the species may forage above the subject area. As such, the proposal is considered unlikely to seriously disrupt an ecologically significant proportion of a population.

Appendix F: Vegetation survey data

TABLE F 1: VEGETATION SURVEY DATA AND LOCATIONS

	BAM Plot					
	BAM 1	BAM 2	BAM 3	BAM 4	BAM 5	BAM 6
PCT	76	76	76	277	76	277
Condition class	Zone 1	Zone 2	Zone 2	Zone 5	Zone 3	Zone 4
MGA Zone	55	55	55	55	55	55
Easting	535516	535498	535580	536007	535239	535249
Northing	6104553	6104584	6104773	6104389	6104505	6104529
Bearing	245	10	200	349	127	10
Composition (Tree)	2	0	0	0	1	4
Composition (Shrub)	1	0	0	0	0	1
Composition (Grass)	1	5	3	1	7	5
Composition (Forbs)	2	8	4	0	1	2
Composition (Ferns)	0	0	0	0	0	0
Composition (Other)	0	0	0	0	0	0
Structure (Tree)	33	0	0	0	0.2	86
Structure (Shrub)	0.1	0	0	0	0	0.1
Structure (Grass)	0.2	5.8	2.8	0.5	7.8	2.1
Structure (Forbs)	0.2	1	0.9	0	0.1	0.2
Structure (Ferns)	0	0	0	0	0	0
Structure (Other)	0	0	0	0	0	0
Large Trees	2	0	0	0	0	0
Hollow trees	2	0	0	0	0	0
Litter Cover	89.8	56.6	51	14.6	4.8	91.8
Fallen Logs length	47	0	0	0	0	0
Tree Stem 5 - 9 cm	0	0	0	0	0	0
Tree Stem 10 -19 cm	0	0	0	0	0	Present
Tree Stem 20 - 29 cm	2	0	0	0	0	Present
Tree Stem 30 - 49 cm	0	0	0	0	0	Present
Tree Stem 50 - 79 cm	0	0	0	0	0	0
Tree Regeneration <5 cm	Present (7)	Absent	0	0	Present (2)	Present (4)
High Threat Exotic	6	0.9	1.2	20	30.4	0.4
Plot-based vegetation survey?	Yes	Yes	Yes	Yes	Yes	Yes
Vegetation integrity survey?	Yes	Yes	Yes	Yes	Yes	Yes

Appendix G: Species observed during fieldwork

Flora species observed in the subject land

This list focuses on native and wild species observed in the subject land. It may not include plants obviously planted in the area e.g., as part of a garden or landscaping. The following codes denote the status of a species:

H	High Threat Exotic (NSW)
K	Species that is associated with a Key Threatening Process
N	Native species (not listed as a threatened species)
P	Protected species (not listed as a threatened species but subject to special protections)
T	Threatened species (may be Vulnerable, Endangered or Critically Endangered)
W	Weed of National Significance
X	Other exotic species

TABLE G 1: FLORA SPECIES OBSERVED IN THE SUBJECT LAND DURING FIELDWORK

Scientific name	Common name	Family	Status
Trees			
<i>Acacia dealbata</i>	Silver Wattle	Fabaceae (Mimosoideae)	N
<i>Acacia melanoxylon</i>	Blackwood	Fabaceae (Mimosoideae)	N
<i>Acacia salicina</i>	Willow Wattle	Fabaceae (Mimosoideae)	N
<i>Eucalyptus albens</i>	White Box	Myrtaceae	N
<i>Eucalyptus blakelyi</i>	Blakely's Red Gum	Myrtaceae	N
<i>Eucalyptus camaldulensis</i>	River Red Gum	Myrtaceae	N
<i>Eucalyptus goniocalyx</i>	Bundy	Myrtaceae	N
<i>Eucalyptus leucoxydon</i>	Yellow Gum	Myrtaceae	N
<i>Eucalyptus mannifera</i>	Brittle Gum	Myrtaceae	N
<i>Eucalyptus melliodora</i>	Yellow Box	Myrtaceae	N
<i>Eucalyptus microcarpa</i>	Western Grey Box	Myrtaceae	N
<i>Eucalyptus polyanthemos</i>	Red Box	Myrtaceae	N
<i>Eucalyptus sideroxydon</i>	Mugga Ironbark	Myrtaceae	N
<i>Olea europaea</i>	Common Olive	Oleaceae	H
<i>Salix nigra</i>	Black Willow	Salicaceae	W
Shrubs			
<i>Acacia</i> sp.	A Wattle	Fabaceae (Mimosoideae)	N
<i>Acacia buxifolia</i>	Box-leaved Wattle	Fabaceae (Mimosoideae)	N
<i>Acacia mearnsii</i>	Black Wattle	Fabaceae (Mimosoideae)	N
<i>Acacia myrtifolia</i>	Red-stemmed Wattle	Fabaceae (Mimosoideae)	N
<i>Callistemon</i> sp.	A Bottlebrush	Myrtaceae	N
<i>Dodonaea viscosa</i>	Sticky Hop-bush	Sapindaceae	N

Scientific name	Common name	Family	Status
<i>Sclerolaena birchii</i>	Galvanized Burr	Chenopodiaceae	N
Grasses and Grasslike			
<i>Austrostipa bigeniculata</i>	Tall Speargrass	Poaceae	N
<i>Austrostipa scabra</i>	Speargrass	Poaceae	N
<i>Avena</i> sp.	Oats	Poaceae	X
<i>Bothriochloa macra</i>	Red Grass	Poaceae	N
<i>Bromus catharticus</i>	Prairie Grass	Poaceae	X
<i>Bromus diandrus</i>	Great Brome	Poaceae	H
<i>Bromus hordeaceus</i>	Soft Brome	Poaceae	X
<i>Carex appressa</i>	Tall Sedge	Cyperaceae	N
<i>Chloris truncata</i>	Windmill Grass	Poaceae	N
<i>Cyperus eragrostis</i>	Umbrella Sedge	Cyperaceae	H
<i>Dactylis glomerata</i>	Cocksfoot	Poaceae	X
<i>Digitaria</i> sp.	Umbrella Grass	Poaceae	X
<i>Eleocharis acuta</i>	Common Spikerush	Cyperaceae	N
<i>Eleusine tristachya</i>	Goose Grass	Poaceae	X
<i>Elymus scaber</i>	Common Wheatgrass	Poaceae	N
<i>Eragrostis brownii</i>	Brown's Lovegrass	Poaceae	N
<i>Eragrostis cilianensis</i>	Stinkgrass	Poaceae	X
<i>Eragrostis curvula</i>	African Lovegrass	Poaceae	H
<i>Eragrostis elongata</i>	Clustered Lovegrass	Poaceae	N
<i>Hordeum leporinum</i>	Barley Grass	Poaceae	X
<i>Juncus filicaulis</i>	A Rush	Juncaceae	N
<i>Lomandra filiformis</i> subsp. <i>coriacea</i>	Wattle Matt-rush	Lomandraceae	N
<i>Lomandra multiflora</i> subsp. <i>multiflora</i>	Many-flowered Mat-rush	Lomandraceae	N
<i>Panicum capillare</i>	Witchgrass	Poaceae	X
<i>Panicum effusum</i>	Hairy Panic	Poaceae	N
<i>Paspalidium</i> sp.	Paspalidium Grass	Poaceae	N
<i>Paspalum dilatatum</i>	Paspalum	Poaceae	H
<i>Paspalum distichum</i>	Water Couch	Poaceae	N
<i>Pennisetum clandestinum</i>	Kikuyu Grass	Poaceae	H
<i>Phalaris aquatica</i>	Phalaris	Poaceae	X
<i>Rytidosperma caespitosum</i>	Ringed Wallaby Grass	Poaceae	N
<i>Rytidosperma racemosum</i>	Wallaby Grass	Poaceae	N
<i>Setaria parviflora</i>	Marsh Brittlegrass	Poaceae	X
<i>Sporobolus</i> sp.	Rat's Tail Couch	Poaceae	X
<i>Typha domingensis</i>	Narrow-leaved Cumbungi	Typhaceae	N
<i>Vulpia myuros</i>	Rat's Tail Fescue	Poaceae	X
Forbs			
<i>Alternanthera denticulata</i>	Lesser Joyweed	Amaranthaceae	N
<i>Alternanthera pungens</i>	Khaki Weed	Amaranthaceae	H
<i>Arctotheca calendula</i>	Capeweed	Asteraceae	X
<i>Amaranthus</i> sp.	Amaranth	Amaranthaceae	X

Scientific name	Common name	Family	Status
<i>Boerhavia dominii</i>	Tarvine	Nyctaginaceae	N
<i>Carthamus lanatus</i>	Saffron Thistle	Asteraceae	H
<i>Chamaesyce drummondii</i>	Caustic Weed	Euphorbiaceae	N
<i>Chenopodium album</i>	Fat Hen	Chenopodiaceae	X
<i>Chondrilla juncea</i>	Skeleton Weed	Asteraceae	X
<i>Cirsium vulgare</i>	Spear Thistle	Asteraceae	X
<i>Conyza bonariensis</i>	Flaxleaf Fleabane	Asteraceae	X
<i>Cucumis myriocarpus</i> subsp. <i>leptodermis</i>	Paddy Melon	Cucurbitaceae	X
<i>Dysphania pumilio</i>	Small Crumbweed	Chenopodiaceae	N
<i>Echium plantagineum</i>	Patterson's Curse	Boraginaceae	X
<i>Echium vulgare</i>	Viper's Bugloss	Boraginaceae	X
<i>Einadia nutans</i>	Climbing Saltbush	Chenopodiaceae	N
<i>Epilobium billardierianum</i>	Willowherb	Onagraceae	N
<i>Erodium cicutarium</i>	Common Crowfoot	Geraniaceae	X
<i>Euchiton</i> sp.	A Cudweed	Asteraceae	X
<i>Heliotropium europaeum</i>	Potato Weed	Boraginaceae	X
<i>Hypericum gramineum</i>	Small St John's Wort	Clusiaceae	N
<i>Hypericum perforatum</i>	St. John's Wort	Clusiaceae	H
<i>Hypochaeris radicata</i>	Catsear	Asteraceae	X
<i>Lactuca serriola</i>	Prickly Lettuce	Asteraceae	X
<i>Lepidium africanum</i>	Common Peppergrass	Brassicaceae	X
<i>Lythrum hyssopifolia</i>	Hyssop Loosestrife	Lythraceae	N
<i>Malva parviflora</i>	Small-flowered Mallow	Malvaceae	X
<i>Marrubium vulgare</i>	White Horehound	Lamiaceae	X
<i>Medicago</i> sp.	A Medic	Fabaceae (Faboideae)	X
<i>Mentha diemenica</i>	Slender Mint	Lamiaceae	N
<i>Modiola caroliniana</i>	Red-flowered Mallow	Malvaceae	X
<i>Nothoscordum</i> sp.	Onion Weed	Amaryllidaceae	X
<i>Oenothera stricta</i> subsp. <i>stricta</i>	Evening Primrose	Onagraceae	X
<i>Oxalis perennans</i>	Wood-sorrel	Oxalidaceae	N
<i>Oxalis</i> sp.	A Wood-sorrel	Oxalidaceae	X
<i>Persicaria decipiens</i>	Slender Knotweed	Polygonaceae	N
<i>Persicaria prostrata</i>	Creeping Knotweed	Polygonaceae	N
<i>Phyla canescens</i>	Lippia	Verbenaceae	H
<i>Plantago lanceolata</i>	Lamb's Tongues	Plantaginaceae	X
<i>Polygonum aviculare</i>	Wireweed	Polygonaceae	X
<i>Portulaca oleracea</i>	Pigweed	Portulacaceae	N
<i>Pseudognaphalium luteoalbum</i>	Jersey Cudweed	Asteraceae	N
<i>Ranunculus sceleratus</i>	Celery Buttercup	Ranunculaceae	X
<i>Romulea rosea</i> var. <i>australis</i>	Onion Grass	Iridaceae	X
<i>Rumex crispus</i>	Curled Dock	Polygonaceae	X
<i>Salvia verbenaca</i>	Vervain	Lamiaceae	X
<i>Sida corrugata</i>	Corrugated Sida	Malvaceae	N

Scientific name	Common name	Family	Status
<i>Solanum nigrum</i>	Black-berry Nightshade	Solanaceae	X
<i>Tribulus terrestris</i>	Cat-head	Zygophyllaceae	X
<i>Trifolium angustifolium</i>	Narrow-leaved Clover	Fabaceae (Faboideae)	X
<i>Vittadinia cuneata</i>	A Fuzzweed	Asteraceae	N
<i>Wahlenbergia luteola</i>	Bluebell	Campanulaceae	N
<i>Xanthium spinosum</i>	Bathurst Burr	Asteraceae	H
Others			
<i>Amyema</i> sp.	Mistletoe	Loranthaceae	N
<i>Rubus fruticosus</i> sp. agg.	Blackberry complex	Rosaceae	W

Fauna species observed in the subject land

This list includes species recorded incidentally and during targeted threatened species surveys within the subject land and provides an indication on the types of species to utilize the project area. Additional fauna species may utilise the site over time subject to variations in factors such as behaviour, season, and weather conditions.

K	Species that is associated with a Key Threatening Process
P	Protected species (not listed as a threatened species but subject to special protections)
T	Threatened species (may be Vulnerable, Endangered or Critically Endangered)
X	Other exotic species

TABLE G 2: FAUNA SPECIES OBSERVED DURING FIELDWORK

Scientific name	Common name	Family	Status	Observation type
Birds				
<i>Aquila audax</i>	Wedge-tailed Eagle	Accipitridae	P	Visual
<i>Dacelo novaeguineae</i>	Laughing Kookaburra	Alcedinidae	P	Call
<i>Todiramphus sanctus</i>	Sacred Kingfisher		P	Visual
<i>Anas superciliosa</i>	Pacific Black Duck	Anatidae	P	Visual
<i>Chenonetta jubata</i>	Australian Wood Duck		P	Visual
<i>Egretta novaehollandiae</i>	White-faced Heron	Ardeidae	P	Visual
<i>Gymnorhina tibicen</i>	Australian Magpie	Artamidae	P	Visual
<i>Eolophus roseicapilla</i>	Galah	Cacatuidae	P	Visual
<i>Vanellus miles</i>	Masked Lapwing	Charadriidae	P	Visual
<i>Ocyphaps lophotes</i>	Crested Pigeon	Columbidae	P	Visual
<i>Corvus coronoides</i>	Australian Raven	Corvidae	P	Call
<i>Falco berigora</i>	Brown Falcon	Falconidae	P	Visual
<i>Falco peregrinus</i>	Peregrine Falcon		P	Visual
<i>Hirundo neoxena</i>	Welcome Swallow	Hirundinidae	P	Visual
<i>Malurus cyaneus</i>	Superb Fairy-wren	Maluridae	P	Visual
<i>Anthochaera carunculata</i>	Red Wattlebird	Meliphagidae	P	Call
<i>Lichenostomus penicillatus</i>	White-plumed Honeyeater		P	Visual
<i>Grallina cyanoleuca</i>	Magpie-lark	Monarchidae	P	Call
<i>Pardalotus sp.</i>	A Pardalote	Pardalotidae	P	Visual
<i>Pelecanus conspicillatus</i>	Australian Pelican	Pelecanidae	P	Visual
<i>Psephotus haematonotus</i>	Red-rumped Parrot	Psittaculidae	P	Visual
<i>Trichoglossus moluccanus</i>	Rainbow Lorikeet		P	Visual
<i>Rhipidura leucophrys</i>	Willie Wagtail	Rhipiduridae	P	Visual
<i>Sturnus vulgaris</i>	Common Starling	Sturnidae	K	Visual
Mammals				
<i>Vulpes vulpes</i>	Fox	Canidae	K	Visual
<i>Lepus capensis</i>	Hare	Leporidae	K	Visual
<i>Oryctolagus cuniculus</i>	Rabbit		K	Burrow
<i>Macropus giganteus</i>	Eastern Grey Kangaroo	Macropodidae	P	Visual

Scientific name	Common name	Family	Status	Observation type
<i>Trichosurus vulpecula</i>	Brush-tailed Possum	Phalangeridae	P	Scat
<i>Vombatus ursinus</i>	Bare-nosed Wombat	Vombatidae	P	Scat
Frogs				
<i>Limnodynastes tasmaniensis</i>	Spotted Marsh Frog	Limnodynastidae	P	Call
<i>Crinia parinsignifera</i>	Eastern Sign-bearing Froglet	Myobatrachidae	P	Call
<i>Crinia signifera</i>	Common Eastern Froglet	Myobatrachidae	P	Call
<i>Litoria peronii</i>	Peron's Tree Frog	Hylidae	P	Visual
Reptiles				
<i>Chelodina longicollis</i>	Eastern Snake-necked Turtle	Chelidae	P	Visual
<i>Lampropholis guichenoti</i>	Pale-flecked Garden Sunskink	Scincidae	P	Visual
Invertebrates				
<i>Acrida</i> sp.	Slantface Grasshopper	Acrididae	P	Visual
<i>Oedaleus australis</i>	A Grasshopper		P	Visual
<i>Teleogryllus commodus</i>	Australian Black Field Cricket	Gryllidae	P	Visual

Appendix H: BAM Credit reports

- Credit summary report, dated 27/09/2024,
- Biodiversity credit report (Like-for-like), dated 27/09/2024,
- Candidate threatened species report, dated 27/09/2024, and
- Predicted species report, dated 27/09/2024.

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00046705/BAAS23004/24/00046706	Gregadoo Solar Farm Mod 4	14/03/2024
Assessor Name	Report Created	BAM Data version *
Simon Vinson	27/09/2024	67
Assessor Number	BAM Case Status	Date Finalised
BAAS23004	Finalised	27/09/2024
Assessment Revision	Assessment Type	
5	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 SAI	Ecosystem credits

Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion

1	277_Zone 4	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	43.1	43.1	0.01	Population size	High Sensitivity to Gain	Critically Endangered Ecological Community	Not Listed	2.50	True	1
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BAM Credit Summary Report

2	277_Zone 5	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	0.3	0.3	0.02	Population size	High Sensitivity to Gain	Critically Endangered Ecological Community	Not Listed	2.50	True	0
										Subtotal	1	

Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions											
3	76_Zone3	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	16.6	16.6	0.01	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00	1
										Subtotal	1
										Total	2

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 SAI	Species credits
<i>Austrostipa wakoolica</i> / <i>A spear-grass</i> (<i>Flora</i>)									
277_Zone4	43.1	43.1	0.01	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	1

BAM Credit Summary Report

277_Zone5	0.3	0.3	0.02	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	1
76_Zone3	16.6	16.6	0.01	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	1
								Subtotal	3
<i>Cullen parvum / Small Scurf-pea (Flora)</i>									
277_Zone4	43.1	43.1	0.01	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Endangered	Not Listed	False	1
277_Zone5	0.3	0.3	0.02	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Endangered	Not Listed	False	1
76_Zone3	16.6	16.6	0.01	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Endangered	Not Listed	False	1
								Subtotal	3

<i>Euphrasia arguta / Euphrasia arguta (Flora)</i>										
277_Zone4	43.1	43.1	0.01	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Critically Endangered	Critically Endangered	True		1
277_Zone5	0.3	0.3	0.02	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Critically Endangered	Critically Endangered	True		1
76_Zone3	16.6	16.6	0.01	Biodiversity Conservation Act listing status	Ecology or response to management is poorly known	Critically Endangered	Critically Endangered	True		1
									Subtotal	3
<i>Keyacris scurra / Key's Matchstick Grasshopper (Fauna)</i>										
277_Zone4	43.1	43.1	0.01	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Endangered	Endangered	False		1
277_Zone5	0.3	0.3	0.02	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Endangered	Endangered	False		1

BAM Credit Summary Report

76_Zone3	16.6	16.6	0.01	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Endangered	Endangered	False	1
								Subtotal	3
<i>Ninox connivens / Barking Owl (Fauna)</i>									
277_Zone4	43.1	43.1	0.01	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	1
277_Zone5	0.3	0.3	0.02	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	1
76_Zone3	16.6	16.6	0.01	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	1
								Subtotal	3
<i>Petaurus norfolcensis / Squirrel Glider (Fauna)</i>									
277_Zone4	43.1	43.1	0.01	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_Zone4	43.1	43.1	0.01	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Endangered Population	Not Listed	False		1
									Subtotal	1
<i>Phascogale tapoatafa / Brush-tailed Phascogale (Fauna)</i>										
277_Zone4	43.1	43.1	0.01	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False		1
									Subtotal	1
<i>Phascolarctos cinereus / Koala (Fauna)</i>										
277_Zone4	43.1	43.1	0.01	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False		1
									Subtotal	1
<i>Synemon plana / Golden Sun Moth (Fauna)</i>										
277_Zone4	43.1	43.1	0.01	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Vulnerable	False		1

277_Zone5	0.3	0.3	0.02	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Vulnerable	False	1
76_Zone3	16.6	16.6	0.01	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Vulnerable	False	1
								Subtotal	3
<i>Tyto novaehollandiae / Masked Owl (Fauna)</i>									
277_Zone4	43.1	43.1	0.01	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	1
277_Zone5	0.3	0.3	0.02	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	1
76_Zone3	16.6	16.6	0.01	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	1
								Subtotal	3



BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00046705/BAAS23004/24/00046706	Gregadoo Solar Farm Mod 4	14/03/2024
Assessor Name	Assessor Number	BAM Data version *
Simon Vinson	BAAS23004	67
Proponent Names	Report Created	BAM Case Status
	27/09/2024	Finalised
Assessment Revision	Assessment Type	Date Finalised
5	Major Projects	27/09/2024

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern 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

Calyptorhynchus lathami lathami / South-eastern Glossy Black-Cockatoo

Haliaeetus leucogaster / White-bellied Sea-Eagle

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Assessment Id

00046705/BAAS23004/24/00046706

Proposal Name

Gregadoo Solar Farm Mod 4

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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	0.0	0	1	1
76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Penepplain, Nandewar and Brigalow Belt South Bioregions	0.0	0	1	1

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
	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Penepplain, Nandewar and Brigalow Belt South Bioregions This includes PCT's: 76, 80, 81, 82, 101, 110, 237, 248, 3405	-	76_Zone3	No	1	Inland Slopes, Bogan-Macquarie, Bondo, Capertee Uplands, Capertee Valley, Crookwell, Hill End, Kerrabee, Lower Slopes, Murray Fans, Murrumbateman, Orange, Pilliga, Talbragar Valley and Wollemi. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.



BAM Biodiversity Credit Report (Like for like)

76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions						
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,	-	277_Zone4	No	1	Inland Slopes, Bogan-Macquarie, Bondo, Capertee Uplands, Capertee Valley, Crookwell, Hill End, Kerrabee, Lower Slopes, Murray Fans, Murrumbateman, Orange, Pilliga, Talbragar Valley and Wollemi. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

BAM Biodiversity Credit Report (Like for like)

	<p>433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 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</p>				
	<p>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,</p>		277_Zone5	No	<p>0 Inland Slopes, Bogan-Macquarie, Bondo, Capertee Uplands, Capertee Valley, Crookwell, Hill End, Kerrabee, Lower Slopes, Murray Fans, Murrumbateman, Orange, Pilliga, Talbragar Valley and Wollemi. or Any IBRA subregion that is within 100 kilometers of the outer edge of the</p>

BAM Biodiversity Credit Report (Like for like)

	<p>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, 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</p>				<p>impacted site.</p>
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Species Credit Summary

Species	Vegetation Zone/s	Area / Count	Credits
Austrostipa wakoolica / A spear-grass	277_Zone4, 277_Zone5, 76_Zone3	0.0	3.00
Cullen parvum / Small Scurf-pea	277_Zone4, 277_Zone5, 76_Zone3	0.0	3.00
Euphrasia arguta / Euphrasia arguta	277_Zone4, 277_Zone5, 76_Zone3	0.0	3.00
Keyacris scurra / Key's Matchstick Grasshopper	277_Zone4, 277_Zone5, 76_Zone3	0.0	3.00
Ninox connivens / Barking Owl	277_Zone4, 277_Zone5, 76_Zone3	0.0	3.00
Petaurus norfolcensis / Squirrel Glider	277_Zone4	0.0	1.00
Petaurus norfolcensis - endangered population / Squirrel Glider in the Wagga Wagga Local Government Area	277_Zone4	0.0	1.00
Phascogale tapoatafa / Brush-tailed Phascogale	277_Zone4	0.0	1.00
Phascolarctos cinereus / Koala	277_Zone4	0.0	1.00
Synemon plana / Golden Sun Moth	277_Zone4, 277_Zone5, 76_Zone3	0.0	3.00
Tyto novaehollandiae / Masked Owl	277_Zone4, 277_Zone5, 76_Zone3	0.0	3.00

Credit Retirement Options

Like-for-like credit retirement options

BAM Biodiversity Credit Report (Like for like)

Austrostipa wakoolica / A spear-grass	Spp	IBRA subregion
	Austrostipa wakoolica / A spear-grass	Any in NSW
Cullen parvum / Small Scurf-pea	Spp	IBRA subregion
	Cullen parvum / Small Scurf-pea	Any in NSW
Euphrasia arguta / Euphrasia arguta	Spp	IBRA subregion
	Euphrasia arguta / Euphrasia arguta	Any in NSW
Keyacris scurra / Key's Matchstick Grasshopper	Spp	IBRA subregion
	Keyacris scurra / Key's Matchstick Grasshopper	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

BAM Biodiversity Credit Report (Like for like)

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
Phascogale tapoatafa / Brush-tailed Phascogale	Spp	IBRA subregion
	Phascogale tapoatafa / Brush-tailed Phascogale	Any in NSW
Phascolarctos cinereus / Koala	Spp	IBRA subregion
	Phascolarctos cinereus / Koala	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

Proposal Details

Assessment Id 00046705/BAAS23004/24/00046706	Proposal Name Gregadoo Solar Farm Mod 4	BAM data last updated * 14/03/2024
Assessor Name Simon Vinson	Report Created 27/09/2024	BAM Data version * 67
Assessor Number BAAS23004	Assessment Type Major Projects	BAM Case Status Finalised
Assessment Revision 5	Date Finalised 27/09/2024	

* 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>Ammobium craspedioides</i> Yass Daisy	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input checked="" type="checkbox"/> Sep <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?
<i>Austrostipa wakoolica</i> A spear-grass	Yes (assumed present)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?
<i>Caladenia arenaria</i> Sand-hill Spider Orchid	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input checked="" type="checkbox"/> Sep <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?

BAM Candidate Species Report

<p><i>Crinia sloanei</i> Sloane's Froglet</p>	<p>No (surveyed)</p>	<p> <input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input checked="" type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec </p> <p><input type="checkbox"/> Survey month outside the specified months?</p>
<p><i>Cullen parvum</i> Small Scurf-pea</p>	<p>Yes (assumed present)</p>	<p> <input checked="" type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input checked="" type="checkbox"/> Dec </p> <p><input type="checkbox"/> Survey month outside the specified months?</p>
<p><i>Diuris tricolor</i> Pine Donkey Orchid</p>	<p>No (surveyed)</p>	<p> <input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input checked="" type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec </p> <p><input type="checkbox"/> Survey month outside the specified months?</p>
<p><i>Euphrasia arguta</i> Euphrasia arguta</p>	<p>Yes (assumed present)</p>	<p> <input checked="" type="checkbox"/> Jan <input checked="" type="checkbox"/> Feb <input checked="" type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input checked="" type="checkbox"/> Dec </p> <p><input type="checkbox"/> Survey month outside the specified months?</p>
<p><i>Hieraaetus morphnoides</i> Little Eagle</p>	<p>No (surveyed) *Survey months are outside of the months specified in Bionet.</p>	<p> <input type="checkbox"/> Jan <input type="checkbox"/> Feb <input checked="" type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input checked="" type="checkbox"/> Aug <input checked="" type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec </p> <p><input checked="" type="checkbox"/> Survey month outside the specified months?</p>
<p><i>Indigofera efoliata</i> Leafless Indigo</p>	<p>No (surveyed)</p>	<p> <input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input checked="" type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec </p> <p><input type="checkbox"/> Survey month outside the specified months?</p>

BAM Candidate Species Report

<p><i>Keyacris scurra</i> Key's Matchstick Grasshopper</p>	<p>Yes (assumed present)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input type="checkbox"/> Mar</td> <td><input type="checkbox"/> Apr</td> </tr> <tr> <td><input type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input type="checkbox"/> Sep</td> <td><input type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input type="checkbox"/> Apr	<input type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input type="checkbox"/> Sep	<input type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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<p><i>Lophoictinia isura</i> Square-tailed Kite</p>	<p>No (surveyed) *Survey months are outside of the months specified in Bionet.</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input checked="" type="checkbox"/> Mar</td> <td><input type="checkbox"/> Apr</td> </tr> <tr> <td><input type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input type="checkbox"/> Sep</td> <td><input type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input checked="" type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input checked="" type="checkbox"/> Mar	<input type="checkbox"/> Apr	<input type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input type="checkbox"/> Sep	<input type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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<p><i>Ninox connivens</i> Barking Owl</p>	<p>Yes (assumed present)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input type="checkbox"/> Mar</td> <td><input type="checkbox"/> Apr</td> </tr> <tr> <td><input type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input type="checkbox"/> Sep</td> <td><input type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input type="checkbox"/> Apr	<input type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input type="checkbox"/> Sep	<input type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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<p><i>Petaurus norfolcensis</i> Squirrel Glider</p>	<p>Yes (assumed present)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input type="checkbox"/> Mar</td> <td><input type="checkbox"/> Apr</td> </tr> <tr> <td><input type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input type="checkbox"/> Sep</td> <td><input type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input type="checkbox"/> Apr	<input type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input type="checkbox"/> Sep	<input type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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<p><i>Petaurus norfolcensis - endangered population</i> Squirrel Glider in the Wagga Wagga Local Government Area</p>	<p>Yes (assumed present)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input type="checkbox"/> Mar</td> <td><input type="checkbox"/> Apr</td> </tr> <tr> <td><input type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input type="checkbox"/> Sep</td> <td><input type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input type="checkbox"/> Apr	<input type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input type="checkbox"/> Sep	<input type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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<p><i>Phascogale tapoatafa</i> Brush-tailed Phascogale</p>	<p>Yes (assumed present)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input type="checkbox"/> Mar</td> <td><input type="checkbox"/> Apr</td> </tr> <tr> <td><input type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input type="checkbox"/> Sep</td> <td><input type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input type="checkbox"/> Apr	<input type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input type="checkbox"/> Sep	<input type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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BAM Candidate Species Report

<p><i>Phascolarctos cinereus</i> Koala</p>	<p>Yes (assumed present)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input type="checkbox"/> Mar</td> <td><input type="checkbox"/> Apr</td> </tr> <tr> <td><input type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input type="checkbox"/> Sep</td> <td><input type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input type="checkbox"/> Apr	<input type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input type="checkbox"/> Sep	<input type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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<p><i>Prasophyllum petilum</i> Tarengo Leek Orchid</p>	<p>No (surveyed)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input type="checkbox"/> Mar</td> <td><input type="checkbox"/> Apr</td> </tr> <tr> <td><input type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input checked="" type="checkbox"/> Sep</td> <td><input type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input type="checkbox"/> Apr	<input type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input checked="" type="checkbox"/> Sep	<input type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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<p><i>Prasophyllum sp. Wybong</i> Prasophyllum sp. Wybong</p>	<p>No (surveyed)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input type="checkbox"/> Mar</td> <td><input type="checkbox"/> Apr</td> </tr> <tr> <td><input type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input checked="" type="checkbox"/> Sep</td> <td><input type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input type="checkbox"/> Apr	<input type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input checked="" type="checkbox"/> Sep	<input type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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<p><i>Swainsona recta</i> Small Purple-pea</p>	<p>No (surveyed)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input type="checkbox"/> Mar</td> <td><input type="checkbox"/> Apr</td> </tr> <tr> <td><input type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input checked="" type="checkbox"/> Sep</td> <td><input type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input type="checkbox"/> Apr	<input type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input checked="" type="checkbox"/> Sep	<input type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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<p><i>Swainsona sericea</i> Silky Swainson-pea</p>	<p>No (surveyed)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input type="checkbox"/> Mar</td> <td><input type="checkbox"/> Apr</td> </tr> <tr> <td><input type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input checked="" type="checkbox"/> Sep</td> <td><input type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input type="checkbox"/> Apr	<input type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input checked="" type="checkbox"/> Sep	<input type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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<p><i>Synemon plana</i> Golden Sun Moth</p>	<p>Yes (assumed present)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input type="checkbox"/> Mar</td> <td><input type="checkbox"/> Apr</td> </tr> <tr> <td><input type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input type="checkbox"/> Sep</td> <td><input type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input type="checkbox"/> Apr	<input type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input type="checkbox"/> Sep	<input type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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BAM Candidate Species Report

<i>Tyto novaehollandiae</i> Masked Owl	Yes (assumed present)	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input type="checkbox"/> Apr
		<input type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug
		<input type="checkbox"/> Sep	<input type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
		<input type="checkbox"/> Survey month outside the specified months?			

Threatened species Manually Added

Common Name	Scientific Name
Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>
Little Eagle	<i>Hieraaetus morphnoides</i>
Square-tailed Kite	<i>Lophoictinia isura</i>
Barking Owl	<i>Ninox connivens</i>
Masked Owl	<i>Tyto novaehollandiae</i>

Threatened species assessed as not on site

Refer to BAR for detailed justification

Common name	Scientific name	Justification in the BAM-C
Ausfeld's Wattle	<i>Acacia ausfeldii</i>	Habitat constraints
Booroolong Frog	<i>Litoria booroolongensis</i>	Habitat degraded
Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>	Habitat constraints
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	Habitat constraints
Large Bent-winged Bat	<i>Miniopterus orianae oceanensis</i>	Habitat constraints
Pink Cockatoo	<i>Lophochroa leadbeateri</i>	Habitat constraints
Pink-tailed Legless Lizard	<i>Aprasia parapulchella</i>	Habitat constraints
Regent Honeyeater	<i>Anthochaera phrygia</i>	Habitat constraints
South-eastern Glossy Black-Cockatoo	<i>Calyptorhynchus lathami lathami</i>	Habitat constraints
Striped Legless Lizard	<i>Delma impar</i>	Habitat degraded Geographic limitations
Superb Parrot	<i>Polytelis swainsonii</i>	Habitat constraints
Swift Parrot	<i>Lathamus discolor</i>	Habitat constraints
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	Habitat constraints

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00046705/BAAS23004/24/00046706	Gregadoo Solar Farm Mod 4	14/03/2024
Assessor Name	Report Created	BAM Data version *
Simon Vinson	27/09/2024	67
Assessor Number	Assessment Type	BAM Case Status
BAAS23004	Major Projects	Finalised
Assessment Revision		Date Finalised
5		27/09/2024

* 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
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
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

BAM Predicted Species Report

Flame Robin	<i>Petroica phoenicea</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
Grey-crowned Babbler (eastern subspecies)	<i>Pomatostomus temporalis temporalis</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
Grey-headed Flying-fox	<i>Pteropus poliocephalus</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
Large Bent-winged Bat	<i>Miniopterus orianae oceanensis</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Little Lorikeet	<i>Glossopsitta pusilla</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
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
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

BAM Predicted Species Report

Spotted-tailed Quoll	<i>Dasyurus maculatus</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
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
White-throated Needletail	<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

Threatened species Manually Added

None added

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Common Name	Scientific Name	Plant Community Type(s)
South-eastern Glossy Black-Cockatoo	<i>Calyptorhynchus 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
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

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>Calyptorhynchus lathami lathami</i>	Habitat constraints
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	Refer to BAR

Attachment 1: Detailed design

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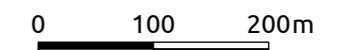
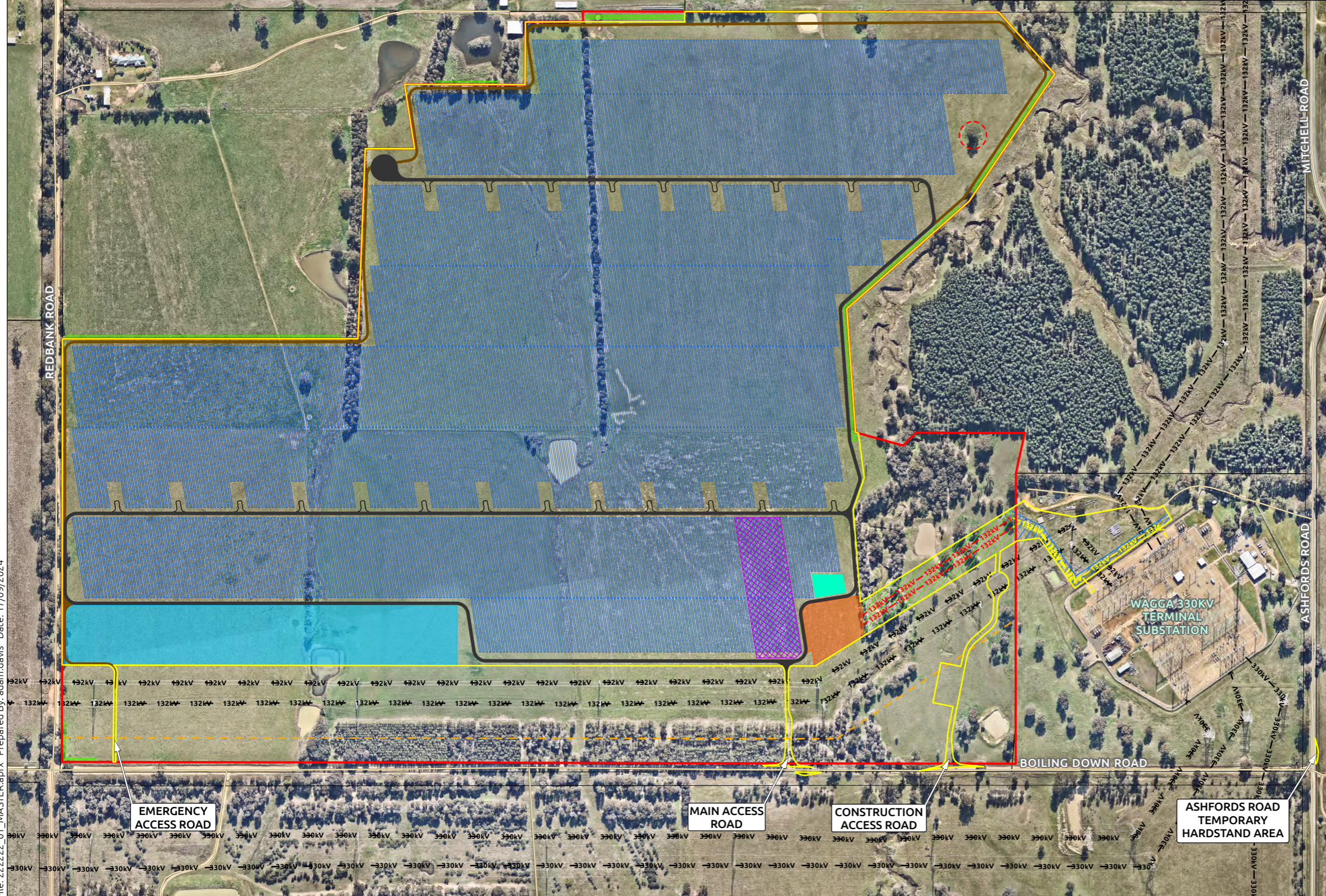
HANWHA ENERGY RETAIL AUSTRALIA Gregadoo Solar Farm



Bakers Lane Temporary Hardstand Area

Legend

- Host Lot
- Development Footprint
- Indicative Visual Screening
- Indicative Internal Road
- Indicative Service Road
- Indicative O&M Building
- Indicative Construction Compound/Laydown Area
- Indicative Asset Protection Zone
- Indicative Substation
- Indicative Array Layout
- Indicative BESS and Substation
- Indicative Overhead Connection Easement
- Indicative Underground Connection Easement
- Indicative Solar Farm 132kV Overhead Transmission Line
- Indicative Solar Farm 132kV Underground Transmission Line
- Transgrid 132kV Transmission Lines
- Transgrid 330kV Transmission Lines
- Transgrid 132kV Easement
- Cadastre
- Road



Attachment 2: EPBC PMST report

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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: 20-Aug-2024

[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:	43
Listed Migratory Species:	9

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:	273
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:	None
Regional Forest Agreements:	1
Nationally Important Wetlands:	None
EPBC Act Referrals:	11
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 (<i>Eucalyptus microcarpa</i>) 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 buffer area only
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 [[Resource Information](#)]

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	Species or species habitat 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 known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to 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 known to 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 may 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
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat may occur within area	In feature area
Lophochroa leadbeateri leadbeateri Major Mitchell's Cockatoo (eastern), Eastern Major Mitchell's Cockatoo, Pink Cockatoo (eastern) [82926]	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 known 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
FISH			
Bidyanus bidyanus Silver Perch, Bidyan [76155]	Endangered	Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
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 feature area
Maccullochella macquariensis Trout Cod [26171]	Endangered	Species or species habitat known to occur within area	In buffer area only
Maccullochella peelii Murray Cod [66633]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Macquaria australasica Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area	In feature area
FROG			
Crinia sloanei Sloane's Froglet [59151]	Endangered	Species or species habitat may 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
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

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area	In feature area
PLANT			
Austrostipa wakoolica [66623]	Endangered	Species or species habitat may occur within area	In buffer area only
Brachyscome muelleroides Mueller Daisy [15572]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Caladenia arenaria Sand-hill Spider-orchid [9275]	Endangered	Species or species habitat may occur within area	In feature area
Caladenia concolor Crimson Spider-orchid, Maroon Spider-orchid [5505]	Vulnerable	Species or species habitat may occur within area	In feature area
Lepidium aschersonii Spiny Peppercross [10976]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Lepidium monoplocoides Winged Pepper-cress [9190]	Endangered	Species or species habitat may occur within area	In buffer area only
Prasophyllum petilum Tarengo Leek Orchid [55144]	Endangered	Species or species habitat may occur within area	In feature area
Swainsona murrayana Slender Darling-pea, Slender Swainson, Murray Swainson-pea [6765]	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

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			
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
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to 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 known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to 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 may 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
Commonwealth Bank of Australia		
Commonwealth Land - Commonwealth Bank of Australia [14932]	NSW	In buffer area only
Commonwealth Land - Commonwealth Bank of Australia [14772]	NSW	In buffer area only
Commonwealth Land - Commonwealth Bank of Australia [14796]	NSW	In buffer area only
Commonwealth Land - Commonwealth Bank of Australia [14775]	NSW	In buffer area only
Communications, Information Technology and the Arts - Australian Broadcasting Corporation		
Commonwealth Land - Australian Broadcasting Corporation [14954]	NSW	In buffer area only
Communications, Information Technology and the Arts - Telstra Corporation Limited		
Commonwealth Land - Australian Telecommunications Commission [14945]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [14946]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [14738]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [14727]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [14911]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [14959]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [14953]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [14955]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [14753]	NSW	In buffer area only
Defence		
Commonwealth Land - Defence Service Homes Corporation [14947]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [14916]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [14917]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - Defence Service Homes Corporation [14920]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [14921]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [14910]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [14919]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [14949]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [14915]	NSW	In buffer area only
Defence - BLAMEY BARRACKS - KAPOOKA [11193]	NSW	In buffer area only
Defence - BLAMEY BARRACKS - KAPOOKA [11183]	NSW	In buffer area only
Defence - RAAF BASE WAGGA [11215]	NSW	In buffer area only
Defence - RAAF BASE WAGGA [11218]	NSW	In buffer area only
Defence - RAAF BASE WAGGA [11214]	NSW	In buffer area only
Defence - RAAF BASE WAGGA [11213]	NSW	In buffer area only
Defence - RAAF BASE WAGGA [11217]	NSW	In buffer area only
Defence - RAAF BASE WAGGA [11216]	NSW	In buffer area only
Defence - WAGGA ARES DEPOT ; BLAMEY BKS -WAGGA WAGGA TRG DEP [11207]	NSW	In buffer area only
Defence - WAGGA ARES DEPOT ; BLAMEY BKS -WAGGA WAGGA TRG DEP [11206]	NSW	In buffer area only
Defence - WAGGA ARES DEPOT ; BLAMEY BKS -WAGGA WAGGA TRG DEP [11208]	NSW	In buffer area only
Defence - WAGGA - WATER BORE SITE AP1 [11230]	NSW	In buffer area only
Defence - WAGGA - WATER BORE SITE AP2 [11232]	NSW	In buffer area only
Defence - WAGGA - WATER BORE SITE AP3 [11231]	NSW	In buffer area only
Defence - Defence Housing Authority		
Commonwealth Land - Defence Housing Authority [14936]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14937]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14934]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14935]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14938]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - Defence Housing Authority [14939]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14766]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14767]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14785]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14765]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16126]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16127]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16128]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14941]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14823]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14822]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14831]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14942]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14836]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14835]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14944]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14830]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14837]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14930]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14933]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14834]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14931]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14820]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16248]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14737]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14736]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16249]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - Defence Housing Authority [14724]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14748]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16251]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14797]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16250]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16350]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14877]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14832]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14833]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14838]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14839]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14749]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14746]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14747]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14744]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14739]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14745]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14742]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14743]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14740]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14730]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14741]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14771]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14913]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14818]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14889]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14888]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - Defence Housing Authority [14770]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14733]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14732]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14731]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14779]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14778]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14912]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14773]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14787]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14726]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14928]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14852]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14786]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14725]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14958]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14868]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14783]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14859]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14869]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14929]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14821]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14940]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14853]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14722]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14850]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14851]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14863]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - Defence Housing Authority [14927]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14903]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14924]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14780]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14861]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14925]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14862]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14841]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14879]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14923]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14878]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14871]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14870]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14926]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14873]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14872]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14875]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14874]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14840]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14876]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14860]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14908]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14866]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14865]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14864]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15719]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14768]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - Defence Housing Authority [14847]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14846]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14845]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14904]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14844]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16129]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14788]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14849]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14848]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14901]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14902]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14907]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14900]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14905]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14842]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14906]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14843]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14781]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14769]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14829]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14760]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14761]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14762]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14828]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14789]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14909]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14867]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - Defence Housing Authority [16345]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16344]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14893]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14892]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16347]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16346]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14896]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14897]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14890]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14891]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14800]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14802]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14803]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16348]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14886]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16349]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16343]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14764]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14826]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14763]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14827]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14798]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14857]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14799]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14855]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14854]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14856]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - Defence Housing Authority [14792]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14793]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14790]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14791]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16501]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16500]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14794]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14899]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14795]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14898]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14729]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14728]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14894]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14881]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14895]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14880]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14883]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14882]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14723]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14858]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14815]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14784]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15720]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14948]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14776]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14777]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14774]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - Defence Housing Authority [14825]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14824]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14952]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16130]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14956]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14957]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14950]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14951]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14819]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14814]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16131]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14885]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14813]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14812]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14811]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14810]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14817]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14816]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14758]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14887]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14756]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14759]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14801]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14806]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14804]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14805]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14808]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - Defence Housing Authority [14809]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14754]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14755]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14757]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14750]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14751]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14752]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [14943]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [14914]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [14922]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [14782]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [14918]	NSW	In buffer area only

Unknown

Commonwealth Land - [14735]	NSW	In buffer area only
Commonwealth Land - [14734]	NSW	In buffer area only
Commonwealth Land - [14884]	NSW	In buffer area only

Listed Marine Species

[[Resource Information](#)]

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

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to 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 may 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
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

Scientific Name	Threatened Category	Presence Text	Buffer Status
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

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 buffer area only

EPBC Act Referrals [\[Resource Information \]](#)

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Blamey Barracks Kapooka Redevelopment Project	2023/09649		Referral Decision	In buffer area only
EnergyConnect NSW - Eastern Section	2020/8766		Post-Approval	In feature area
Controlled action				
Olympic Highway Realignment & Construct Road-Over-Rail Bridge, Wagga Wagga NSW	2013/6956	Controlled Action	Post-Approval	In buffer area only
Not controlled action				
Access road to Gumly Gumly Quarry	2007/3813	Not Controlled Action	Completed	In buffer area only
Albury to Illabo Section of Inland Rail	2020/8670	Not Controlled Action	Completed	In feature area
Gregadoo Solar Farm 19-590	2020/8643	Not Controlled Action	Completed	In feature area

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
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
Red Hill Road extension	2005/2311	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Referral decision				
New transmission infrastructure, HumeLink	2021/9121	Referral Decision	Referral Publication	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 are 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

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

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

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
- 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

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Please feel free to provide feedback via the [Contact us](#) page.

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