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Piambong Wind Farm

Preliminary Biodiversity Assessment

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Glossary and list of abbreviations

Term or abbreviation	Definition
BAM	Biodiversity Assessment Methodology (DPIE, 2020)
BC Act	NSW *Biodiversity Conservation Act 2016* (NSW)
BDAR	Biodiversity Development Assessment Report
BOS	NSW Biodiversity Offsets Scheme
CEEC	Critically Endangered Ecological Community
CWOREZ	Central-West Orana Renewable Energy Zone
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DNG	Derived Native Grassland
DPIE	Department of Planning, Industry and Environment (formerly DECCW, DECC, DEC, OEH)
EEC	Endangered Ecological Community
EIS	Environmental Impact Statement
EP&A Act	NSW *Environmental Planning and Assessment Act 1979*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
ha	Hectare/s
IBRA	Interim Biogeographic Regionalisation for Australia
km	kilometres
kV	kilovolt
LLS Act	*Local Land Services Act 2013*
Locality	The Study Area and surrounds, nominally a 10 kilometre radius from the Study Area.
MNES	Matters of National Environmental Significance
m	Metre/s
NVR	Native Vegetation Regulatory
PCT	Plant Community Type
PVP	Property Vegetation Plan
Site	The land (lots) subject to the proposed development activity.
SSD	State Significant Development
Study Area	The Site and land surrounding the Site up to 1500 m
TEC	Threatened Ecological Community

1. Introduction

1.1 Background

Niche Environment and Heritage Pty Ltd (Niche) were engaged by AECOM, on behalf of Piambong Wind Farm Pty Ltd (Vestas), to undertake a Preliminary Biodiversity Assessment for the Piambong Wind Farm Project (the 'Project') near Gulgong, NSW (the 'Site') (Figure 1).

The Project will generate up to 551 megawatts (MW) and will ultimately feed into either the existing or planned transmission infrastructure associated with the Central-West Orana Renewable Energy Zone (CWO REZ).

The Project will be assessed as State Significant Development (SSD) under Part 4, Division 4.7 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) and will be accompanied by an Environmental Impact Statement (EIS). This Preliminary Biodiversity Assessment is intended to support preparation of a SSD Scoping Report and Project referral to the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW).

1.2 Project description

Piambong Wind Farm has developed a conceptual layout with up to 81 turbines within the Site boundary, with at least 500 metre (m) spacing between turbines (Figure 2). Underground cabling would connect the turbines to one or more onsite substations. The Project could connect to the NSW transmission network via a new transmission line extending approximately 4.5 km to the north of the northernmost turbine location. A battery Energy Storage (BESS) facility and Operations and Maintenance (O&M) building would also be located within the Site. Indicative locations of these items are presented in Figure 2.

Whilst construction compounds and laydown areas would be required for Project construction, these have not been considered here given the early stage of the Project and uncertainties regarding their location. Nonetheless, any compound or laydown area would be situated within lands identified as being of low biodiversity value wherever practicable.

The specific preliminary development footprint forming the basis for the impact assessment is presented and discussed in Section 5 of this report.

1.3 Location

The Site is approximately 10,000 hectares (ha) and is located approximately 15 km south-west of Gulgong and 20 km north-west of Mudgee, NSW (Figure 1), within the Mid-Western Regional Local Government Area (LGA) and the Inland Slopes Interim Biogeographic Regionalisation for Australia (IBRA) subregion.

Approximately 56% of the Site has been historically cleared for agriculture, with some areas having been cultivated and sown with exotic pasture species. Native vegetation still remains in timbered areas or areas that are less fertile or too steep and rocky to cultivate. Numerous waterbodies occur within the Site, including Black Halls Creek, Crowirs Creek, Dog Trap Creek, Gulf Creek, Leaning Oak Creek, Piambong Creek, Ruins Creek, Shawns Creek, Staircase Creek and Yarraman Creek, as well as farm dams.

1.4 Purpose of this assessment

The purpose of the assessment is to:

- Identify biodiversity issues that may pose a constraint to the Project, including:
  - Threatened Ecological Communities (TECs)

- Potential habitat for threatened species as well as other significant protected species (i.e. resident raptors)
- Potential Serious and Irreversible Impact (SAIIs) entities
- Habitat for threatened aquatic species.

- Identify likely significant impacts to Matters of National Environmental Significance (MNES)
- Inform potential avoidance and minimisation strategies that will be critical in ensuring that impacts on the environment are kept to a minimum
- Provide a broad estimate of ecosystem credit and species credit[1] requirements for the Project
- Support preparation of a SSD Scoping Report to DPE and Project referral to DCCEEW.

1.5 Legislation

The following legislation has been considered as part of this assessment:

- *Environmental Planning and Assessment Act 1979* (EP&A Act)
- *Biodiversity Conservation Act 2016* (BC Act)
- *Fisheries Management Act 1994* (FM Act)
- *Local Land Services Act 2013* (LLS Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

1.5.1 NSW *Environmental Planning and Assessment Act 1979*

The EP&A Act provides an assessment framework (in concert with the BC Act) for the consideration of impacts to threatened biodiversity.

The Project is to be assessed as SSD under Part 4, Division 4.7 of the EP&A Act. As such proponents are required to apply the Biodiversity Offsets Scheme (BOS) and Biodiversity Assessment Method (BAM) (DPIE 2020) to prepare a Biodiversity Development Assessment Report (BDAR) under the BC Act (section 3.9).

1.5.2 NSW *Biodiversity Conservation Act 2016*

Native plants and animals in NSW are protected by the BC Act, with threatened species and ecological communities listed in its Schedules. The purpose of this Act is to maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ecologically sustainable development.

The BC Act is supported by the NSW *Biodiversity Conservation Regulation 2017* (BC Reg), the BAM, offsetting rules, sensitive biodiversity mapping, credit pricing spreadsheet and other guidance documents.

Under section 7.2 of the BC Act, development is likely to significantly affect threatened species if:

a) it is likely to significantly affect threatened species or ecological communities, or their habitats, according to the test in section 7.3 of the BC Act, or
b) the development exceeds the Biodiversity Offsets Scheme (BOS) threshold if the biodiversity offsets scheme applies to the impacts of the development on biodiversity values, or
c) it is carried out in a declared area of outstanding biodiversity value.

Under Section 6 of the BC Act, impacts to native vegetation and/or threatened flora and fauna habitat may be required to be offset.

[1] Select candidate species only and on a cost per hectare basis.

As the Project is SSD, in accordance with section 7.9(2) of the BC Act, the EIS must be accompanied by a BDAR unless the Planning Agency Head (or delegate) and the Environment Agency Head (or delegate) determine that the Project is not likely to have any significant impact on biodiversity values (often referred to as a BDAR waiver).

The BDAR is to outline avoidance and mitigation measures as well as offset requirements for all vegetation clearing, regardless of whether significant impacts on threatened biodiversity are likely to occur. Project approval will require biodiversity offsets as per the requirements of the BDAR or, to a lesser degree, as agreed upon after consultation with the Minister administering the BC Act.

Section 3 of this report outlines the threatened ecological communities and species listed under the BC Act that were recorded, or considered likely to occur, within the Project Site.

1.5.3 NSW *Fisheries Management Act 1994*

The NSW *Fisheries Management Act 1994* (FM Act) sets out a framework to conserve, develop and share the fishery resources of the State for the benefit of present and future generations. Relevant objectives of the FM Act include:

- conserve fish stocks and key fish habitats
- conserve threatened species, populations and ecological communities of fish and marine vegetation
- promote ecologically sustainable development, including the conservation of biological diversity
- recognise the spiritual, social and customary significance to Aboriginal persons of fisheries resources and to protect, and promote the continuation of, Aboriginal cultural fishing.

Works which will need to be considered under the FM Act include the construction of waterway crossings at Staircase Creek, Gulf Creek, Yarraman Creek and Shawns Creek. Potential direct impacts to habitats suitable for the Purple Spotted Gudgeon (*Mogurnda adspersa*) at Yarraman Creek, such as habitat disturbance during construction and indirect impacts to water quality, will need to be assessed through targeted survey and the completion of an Assessment of Significance (7-part test) under Part 221ZV of the FM Act.

Waterway crossing methods and construction management measures should align with those detailed in the *Fisheries NSW Policy and Guidelines for Fish Habitat Conservation and Management* (Fairfull 2013) to mitigate any residual risk to aquatic habitats (sections 4.2 and 3.3.2, respectively). Consultation with fisheries is generally required, however permits under section 201, 205 or 219 of the FM Act are not required for approved SSD projects (clause 5.2.3 of the EP&A Act).

1.5.4 NSW *Local Land Services Act 2013*

The LLS Act categorises land to determine native vegetation management options for landholders. Some vegetation management requires approval, and some does not. The Native Vegetation Regulatory (NVR) Map which displays these land categories is still under development, however the transitional tool can be used to display category 2 – vulnerable regulated land, category 2 – sensitive regulated land and land that is excluded from the LLS Act. Category 1 - exempt land is currently not displayed on the NVR Map and landholders are responsible for determining the categorisation of their land in accordance with section 60F of the LLS Act for these areas. This self-assessment process could be carried out by the proponent for the Project in accordance with the Native Vegetation Regulatory Map: method statement (DPE, 2022).

Some areas of the Site are mapped on the transitional tool as Category 2 - vulnerable regulated land as they are prone to erosion if vegetation is removed. However, large areas of the Site are not mapped and may be considered category 1 exempt land.

Category 1 - exempt land is land where native vegetation can be cleared without approval from LLS, and is defined as land that:

- Was cleared of native vegetation as of 1 January 1990 or lawfully cleared after 1 January 1990
- Low conservation grasslands
- Contains only low conservation groundcover (not being grasslands)
- Contains native vegetation identified as regrowth in a Property Vegetation Plan (PVP) under the repealed *Native Vegetation Act 2003*, only where the PVP specifies a regrowth date
- Land bio-certified under the BC Act.

Lands within the Site that are likely to be eligible for Category 1 categorisation are those classed as low conservation grasslands. Areas not included on the NVR Map are subject to the transitional period. During this period grassland may be considered 'low conservation value grasslands' if it comprises only groundcover whose clearing was permitted by Section 20 of the *Native Vegetation Act 2003*. This states that the clearing of native vegetation that comprises only groundcover is permitted if:

a) The vegetation comprises less than 50% of indigenous species of vegetation, and
b) Not less than 10% of the area is covered with vegetation (whether dead or alive), and
c) Those percentages are calculated in accordance with the regulations.

Areas which are dominated by exotic species (>50% cover) and assigned category 1 – exempt land are unlikely to attract a credit obligation; however, the assignment of such lands will need to be justified in the BDAR. Impacts to threatened species may still need to be considered within these lands.

1.5.5 Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*

The purpose of the EPBC Act is to ensure that actions likely to cause a significant impact on Matters of National Environmental Significance (MNES) undergo an assessment and approval process. Under the EPBC Act, an action includes a project, undertaking, development or activity.

The EPBC Act identifies the following MNES:

- World Heritage properties
- National heritage places
- Ramsar wetlands of international significance
- Threatened species and ecological communities
- Migratory species
- Commonwealth marine areas
- The Great Barrier Reef Marine Park
- Nuclear actions (including uranium mining)
- Water resources (in relation to coal seam gas development and large coal mining development).

MNES which may be affected by this proposal are identified in Section 3 of this assessment and include:

- Threatened ecological communities, and
- Threatened species.

A self-assessment in accordance with the Commonwealth *Significant Impact Criteria 1.1: Matters of National Environmental Significance* (DoE, 2014) is generally required to determine any likely significant impacts to MNES and whether Project referral to the DCCEEW is required. Where DCCEEW consider the action 'has, will have or is likely to have a significant impact on MNES' it is deemed to be a controlled action and may not be undertaken without prior approval from the Commonwealth.

For Commonwealth listed threatened ecological communities and species that require offsetting in NSW, the Commonwealth and NSW Governments have both signed an agreement known as the NSW Assessment Bilateral Agreement (the Agreement). The Agreement aims to streamline the assessment process for major projects that require both NSW and Australian Government environmental approvals. Under the Agreement, the NSW Government assesses development applications on behalf of the Australian Government. The Australian Government remains the decision-maker for the EPBC Act approval, based upon their consideration of the assessment report prepared by DPE.

Under the Agreement, the Australian Government has endorsed the BOS and supports the use of the BAM as the underpinning methodology for calculating biodiversity credit requirements. As such, any NSW proponent (of a state significant project) who needs an EPBC Act approval can use the BOS to assess and meet their biodiversity offset requirements.

2. Methods

2.1 Study Area

The study area for the assessment included the Site and surrounding (within 1500 m) locality (Figure 2).

2.2 Desktop assessment

2.2.1 Database and literature sources

Relevant databases were reviewed prior to field survey to identify data gaps and inform survey design. Database searches for a 10 km radius around the Study Area were conducted in October 2021, May 2022 and revised in July 2023 to identify threatened biodiversity and migratory species known to occur in the locality. The following literature and databases were used for this purpose:

- The Biodiversity Assessment Methodology (BAM) (DPIE 2020) – the methodology used to undertake development and biodiversity stewardship site assessments under the BOS
- State Vegetation Type Map: Central West / Lachlan Region Version 1.4. VIS_ID 4468 (DPIE 2015)
- The BioNet Atlas (DPE 2023a) (accessed October 2021,May 2022 and July 2023)
- The NSW BioNet Vegetation Classification database as the primary source for the NSW Plant Community Type (PCT) classification (DPE 2023b)
- SPRAT Database and Protected Matters Search Tool (DCCEEW 2023) (accessed October 2021, May 2022 and July 2023)
- Fisheries spatial data portal and threatened species distribution mapping for key fish habitat and other potentially occurring threatened species (DPI 2021).

2.2.2 Threatened ecological community likelihood of occurrence

A review of the existing vegetation mapping prepared for the Central West/Lachlan region (DPIE 2015) was undertaken to determine which PCTs have been mapped within the Site. Using the online BioNet Vegetation Classification Database these PCTs were then reviewed to identify any that conformed to, or had an association with, a TEC.

2.2.3 Threatened and migratory species likelihood of occurrence

A list of subject threatened flora and fauna within the locality (10 km radius) were determined from database searches as detailed in Section 2.2.1. In addition, a list of candidate threatened species were also exported from the BAM Calculator (BAM-C) for each IBRA subregion within 20 km of the Site and added to this list. The list of potentially affected threatened species was prepared from consideration of this list.

In order to adequately determine the relevant level of assessment to apply to potentially affected species, further analysis of the likelihood of those species occurring within the Site was completed. Five categories for 'likelihood of occurrence' (Table 1) were attributed to species after consideration of criteria such as known records, presence or absence of important habitat features within the Site, results of the field surveys and professional judgement. This process was completed on an individual species basis.

Species assigned 'Known', 'High' or 'Moderate' categories, and where impacts for the species could reasonably occur from the development, will likely require targeted survey. Species assigned 'Low' or 'None' categories are those for which there is limited or no habitat present within the Site. However, species exported from the BAM-C may still require survey to confirm absence and remove their credit liability, unless it can be justified they would not rely on the Site based on lack of important habitat constraints, degraded habitat or geographic limitations. Such a justification would typically require a report prepared by a person with expertise relating to that species or ecological community.

Table 1: Likelihood of occurrence criteria

Likelihood rating	Threatened flora criteria	Threatened and migratory fauna criteria
Known	The species was observed within the Site.	The species was observed within the Site.
High	It is likely that a species inhabits or utilises habitat within the Site.	It is likely that a species inhabits or utilises habitat within the Site.
Moderate	Potential habitat for a species occurs within the Site. Adequate field survey would determine if there is a 'high' or 'low' likelihood of occurrence for the species within the Site.	Potential habitat for a species occurs within the Site and the species may occasionally utilise that habitat. Species unlikely to be wholly dependent on the habitat present within the Site.
Low	It is unlikely that the species inhabits the Site.	It is unlikely that the species inhabits the Site. If present at the Site the species would likely be a transient visitor. The Site contains only very common habitat for this species which the species would not rely on for its on-going local existence.
None	The habitat within the Site is unsuitable for the species.	The habitat within the Site is unsuitable for the species.

2.3 Field survey

2.3.1 Vegetation mapping

Three days of field survey were conducted from 22 - 24 November 2021 by Niche ecologists Yogesh Nair and Sophia Dunn. Survey consisted of rapid assessment, using rapid data points to map native vegetation and identify threatened ecological communities. Survey was predominantly conducted from a vehicle due to the large area requiring survey. Binoculars were used to identify vegetation in difficult-to-access areas or land where access agreements were not in place. Figure 3 shows the extent of field validation relative to the site boundary. Where lands were not directly surveyed, vegetation mapping was extrapolated using state vegetation mapping datasets, field observations and aerial imagery.

2.3.2 Flora survey

Searches for threatened flora were undertaken whilst conducting the vegetation mapping of the Site.

No targeted flora surveys were conducted as part of the study, though these would be undertaken once a final development footprint has been selected.

2.3.3 Fauna survey

The fauna survey incorporated two separate field campaigns carried out over 22 - 24 November and 6 - 7 December 2021. During this assessment, the Site was surveyed initially by vehicle and areas supporting native vegetation and fauna habitat were inspected in more detail on foot. Those portions of the Site that support fauna habitat or have the potential to support threatened species were mapped through a combination of aerial photograph interpretation and ground-truthing using a hand-held GPS (accurate to approximately five metres) (Nature Advisory 2021).

The techniques used to detect fauna species utilising the Site included:

- Incidental searches for mammal scats, tracks and signs (e.g. diggings, signs of feeding and nests/burrows)
- Turning over logs/rocks and other ground debris for reptiles, frogs and mammals (Figure 3)
- Daytime bird observations
- General searches for reptiles and frogs; including identification of frog calls in seasonally wet areas
- General overview searches for bat habitat including waterbodies and potential roosting sites, such as caves and dead trees with hollows
- Songmeters were deployed in trees to record the echolocation calls of bats (Figure 3)

- Trail cameras were installed in trees to survey for arboreal mammals (Figure 3)
- Habitat assessments for Purple Spotted Gudgeon (*Mogurnda adspersa*) using field datasheets provided by Niche (Figure 3)
- Incidental searches for Golden Sun Moth (*Synemon plana*) while traversing the site.

2.4 Limitations

This assessment has been developed using information provided by Piambong Wind Farm to Niche. Information provided within this preliminary assessment has been developed based on the most current information available and the field survey outlined above. This assessment should be treated as a guidance document as the final development footprint has not yet been finalised, and impacts on vegetation and threatened species habitat will change depending on the final location of the development footprint and the outcomes of more detailed field investigations.

Vegetation mapping conducted during the rapid assessment of the Site is only preliminary and relies largely on available mapping data and extrapolation of vegetation validated during the survey. It should be noted that weather conditions at the time of the preliminary survey were generally unsuitable for detection of Golden Sun Moth and further surveys will be required to confirm presence/ absence of this species.

In the event a candidate threatened species has potential habitat within the Site but has not been historically recorded within the Site, the species is assumed to be present for the purpose of the assessment given a lack of targeted survey activities.

3. Results

3.1 Desktop assessment

3.1.1 Threatened Ecological Communities

Based on a review of the State Vegetation Type Mapping undertaken for the Central West / Lachlan Region (DPIE 2015), the following TECs had been recorded within the Site and are considered to have the potential to occur:

- *Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions* listed as an Endangered Ecological Community (EEC) under the BC Act and EPBC Act (referred hereafter as Inland Grey Box Woodland)
- *Natural Temperate Grassland of the South Eastern Highlands* listed as a Critically Endangered Ecological Community (CEEC) under the EPBC Act (referred hereafter as Natural Temperate Grassland)
- *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* listed as a Critically Endangered Ecological Community under the BC Act and EPBC Act (referred hereafter as White Box Yellow Box Blakely's Red Gum Woodland).

3.1.2 Threatened species

The desktop assessment returned a total of 115 threatened species (54 flora and 61 fauna) that have the potential to occur within the Site. Of the 115 species, 35 species are ecosystem credit species and do not require further assessment under the BAM. The likelihood of occurrence (LoO) of remaining species credit and dual credit species was assessed to determine candidate species requiring further assessment under the BAM. Of these species, 19[2] flora and 22 fauna species are considered to have a moderate or high likelihood of occurrence in the Site after taking into account their habitat requirements and observations made during the field survey (Table 2). It is noted that further survey may identify that potential habitat for some of the candidate species may not occur within the final development footprint.

Twenty four of the candidate species (10 flora and 14 fauna) (Table 2) are listed under the EPBC Act and are potentially subject to Commonwealth referral requirements. The SAII species listed in Table 2 are discussed further in Section 5.4. Threatened bird species that may utilise the Site as a potential flyway or migration route are highlighted pink within Table 2.

Two threatened aquatic species have a moderate potential to occur within the Site. The Purple Spotted Gudgeon (*Mogurnda adspersa*), which is listed as Endangered under the FM Act, may occur along Yarraman Creek, and the Murray Cod, listed as Vulnerable under the EPBC Act, may occur within creeks when they are inundated.

[2] It is noted that all flora species are species credit species

Table 2: Threatened species with a moderate or high chance of occurring within the Site. Threatened bird species that may utilise the Site as a potential flyway or migration route are highlighted pink.

Scientific name	Common name	BC Status	EPBC Status	FM Status	Biodiversity credit type	SAII
Flora						
Acacia ausfeldii	Ausfeld's Wattle	V	-	-	Species	No
Ammobium craspedioides	Yass Daisy	V	V	-	Species	No
Cullen parvum	Small Scurf-pea	E	-	-	Species	No
Dichanthium setosum	Bluegrass	V	V	-	Species	No
Diuris tricolor	Pine Donkey Orchid	V	-	-	Species	No
Euphrasia arguta	-	CE	CE	-	Species	Yes
Leucochrysum albicans var. tricolor	Hoary Sunray	E	E	-	Species	No
Monotaxis macrophylla	Large-leafed Monotaxis	E	-	-	Species	No
Persoonia marginata	Clandulla Geebung	V	V	-	Species	No
Polygala linariifolia	Native Milkwort	E	-	-	Species	No
Pomaderris queenslandica	Scant Pomaderris	E	-	-	Species	No
Prasophyllum petilum	Tarengo Leek Orchid	E	E	-	Species	No
Prasophyllum sp. Wybong	-	-	CE	-	Species	Yes
Pultenaea humilis	Dwarf Bush-pea	V	-	-	Species	No
Senecio garlandii	Woolly Ragwort	V	-	-	Species	No
Swainsona recta	Small Purple-pea	E	E	-	Species	No
Swainsona sericea	Silky Swainson-pea	V	-	-	Species	No
Thesium australe	Austral Toadflax	V	V	-	Species	No
Tylophora linearis	Tylophora linearis	V	E	-	Species	No
Aves						
Anthochaera phrygia	Regent Honeyeater	CE	CE	-	Species/Ecosystem	Yes
Aphelocephala leucopsis	Southern Whiteface	-	V	-	N/A	No
Calyptorhynchus lathami	Glossy Black-Cockatoo	-	V	-	Species/Ecosystem	No
Hieraaetus morphnoides	*Little Eagle*	*V*	-	-	*Species/Ecosystem*	*No*
Hirundapus caudacutus	*White-throated Needletail*	-	*V,M*	-	*Species/Ecosystem*	*No*
Lathamus discolor	Swift Parrot	E	CE, Ma	-	Species/Ecosystem	Yes

Scientific name	Common name	BC Status	EPBC Status	FM Status	Biodiversity credit type	SAII
Lophoictinia isura	*Square-tailed Kite*	*V*	-	-	*Species/Ecosystem*	*No*
Myiagra cyanoleuca	*Satin Flycatcher*	-	*M, Ma*	-	*N/A*	*No*
Neophema chrysostoma	*Blue-winged Parrot*	-	*V*	-	*N/A*	*No*
Ninox connivens	Barking Owl	V	-	-	Species/Ecosystem	No
Ninox strenua	Powerful Owl	V	-	-	Species/Ecosystem	No
Polytelis swainsonii	Superb Parrot	V	V	-	Species/Ecosystem	No
Tyto novaehollandiae	Masked Owl	V	-	-	Species/Ecosystem	No
Mammals						
Chalinolobus dwyeri	Large-eared Pied Bat	V	V	-	Species	Yes
Miniopterus orianae oceanensis	Large Bent-winged Bat	V	-	-	Species/Ecosystem	No
Myotis macropus	Southern Myotis	V	-	-	Species	No
Petaurus norfolcensis	Squirrel Glider	V	-	-	Species	No
Phascolarctos cinereus	Koala	E	E	-	Species/Ecosystem	No
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	-	Species/Ecosystem	No
Reptiles						
Delma impar	Striped Legless Lizard	V	V	-	Species	No
Insects						
Synemon plana	Golden Sun Moth	V	V	-	Species	Yes
Fish						
Maccullochella peelii	Murray Cod	-	V	-	N/A	N/A
Mogurnda adspersa	Purple Spotted Gudgeon	-	-	E	N/A	N/A

3.1.3 Migratory species

The desktop assessment returned a total of eleven migratory species that have potential to occur in the Site, including one migratory marine, four migratory terrestrial and six migratory wetland species (Appendix 3).

Of these species, only the White-throated Needletail (*Hirundapus caudacutus*) is considered likely to occur within the Site after taking into account its habitat requirements, known distribution and observations made during the field survey (Table 2).

Further surveys are recommended to confirm to what extent habitats within the Site are utilised by the White-throated Needletail.

3.2 Field survey

3.2.1 Native vegetation

Native vegetation within the Site occurred as both intact and derived native grassland (DNG) and aligned to nineteen PCTs in varying conditions (Table 3) (Figure 4).

Table 3: Condition and area of each PCT within the Site

PCT No.	PCT Name	TEC Listing		Condition	Constraint category	Area (ha)
		EPBC Act	BC Act			
81	*Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion*	EEC	EEC	Moderate	High	0.36
84	*River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion*	-	-	Moderate	Low	2.84
186	*Dwyers Red Gum - Black Cypress Pine - Currawang shrubby low woodland on rocky hills mainly in the NSW South Western Slopes Bioregion*	-	CEEC	DNG	Low	0.03
				Moderate	Low	113.43
266	*White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion*	CEEC	CEEC	DNG	High	41.21
				Low	High	141.37
				Moderate	High	79.72
267	*White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion*	EEC; CEEC	CEEC	DNG	High	2.70
				Moderate	High	14.04
272	*White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes*	-	-	DNG	Low	2.08
				Low	Low	2.70
				Moderate	Low	5.69
277	*Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion*	CEEC	CEEC	DNG	High	793.88
				Low	High	1.05
				Moderate	High	89.67
278	*Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion*	CEEC	CEEC	Moderate	High	6.77
279	*Blakely's Red Gum - White Cypress Pine woodland on footslopes of hills in central part of the NSW South Western Slopes Bioregion*	CEEC	CEEC	Moderate	High	1.63
281	*Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion*	CEEC	CEEC	DNG	High	16.07
				Low	High	83.07
				Moderate	High	226.84

PCT No.	PCT Name	TEC Listing		Condition	Constraint category	Area (ha)
		EPBC Act	BC Act			
283	*Apple Box - Blakely's Red Gum moist valley and footslopes grass-forb open forest of the NSW South Western Slopes Bioregion*	CEEC	CEEC	Moderate	High	0.09
287	*Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion*	-	-	Moderate	Low	356.98
331	*Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion*	-	-	Moderate	Low	0.86
347	*White Box - Blakely's Red Gum shrub/grass woodland on metamorphic hillslopes in the mid-southern part of the upper slopes sub-region of the NSW South Western Slopes Bioregion*	CEEC	CEEC	Low	High	1.82
				Moderate	High	15.50
461	*Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion*	-	-	DNG	Low	3760.22
				Low	Low	1820.46
				Moderate	Low	643.02
477	*Inland Scribbly Gum - Red Stringybark - Black Cypress Pine - Red Ironbark open forest on sandstone hills in the southern Brigalow Belt South Bioregion and northern NSW South Western Slopes Bioregion*	-	-	Moderate	Low	0.42
478	*Red Ironbark - Black Cypress Pine - stringybark +/- Narrow-leaved Wattle shrubby open forest on sandstone in the Gulgong - Mendooran region, southern Brigalow Belt South Bioregion*	-	-	Moderate	Low	0.43
511	*Queensland Bluegrass - Redleg Grass - Rats Tail Grass - spear grass - panic grass derived grassland of the Nandewar Bioregion and Brigalow Belt South Bioregion*	CEEC	CEEC	DNG	High	3.76
1330	*Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion*	CEEC	CEEC	DNG	High	143.60
				Moderate	High	384.91
Total						**8,768.15**
n/a	Non native	No	No	n/a	n/a	59.0
Total						**8,827.15**

Ten of the PCTs mapped within the Site, PCT 266, PCT 267PCT 277, PCT 278, PCT 279, PCT 281, PCT 283, PCT 347, PCT 511 and PCT 1330 (Table 3), align to the Critically Endangered White Box Yellow Box Blakely's Red Gum Woodland. All condition classes of these PCTs are considered to align with both the Commonwealth and State listings.

Two PCTs mapped within the Site (PCT 81 and PCT 267) align with the Endangered Inland Grey Box Woodland listed under the BC Act.

PCT 186 was **not** considered to align with the Critically Endangered Mallee and Mallee-Broombush dominated woodland and shrubland listed under the BC Act. The geographic distribution of this TEC occurs over 300 km from the Site and no mallee communities were observed on the site.

No other TECs are considered likely to occur within the Site.

3.2.2 Threatened flora

Suitable habitat for threatened flora species was recorded within the Site. However, no threatened flora were directly recorded during the vegetation surveys (noting the primary aim of the field survey was to validate the vegetation present and not to conduct targeted flora surveys).

3.2.3 Threatened fauna and migratory species

Ten threatened fauna species were recorded, or were indicated as occurring, in the Site during the field survey (Figure 5), including:

- Diamond Firetail (*Stagonopleura guttata*)
- Dusky Woodswallow (*Artamus cyanopterus cyanopterus*)
- Speckled Warbler (*Chthonicola sagittate*)
- Varied Sittella (*Daphoenositta chrysoptera*)
- Glossy Black-Cockatoo (*Calyptorhynchus lathami*) – indicated through the presence of crushed Casuarina cones.
- Large-eared Pied Bat (*Chalinolobus dwyeri*)
- Little Bent-winged Bat (*Miniopterus australis*)
- Large Bent-winged Bat (*Miniopterus orianae oceanensis*)
- Yellow-belllied Sheathtail-bat (*Saccolaimus flaviventris*)
- Greater Broad-nosed Bat (*Scoteanax rueppellii*).

The Glossy Black-Cockatoo and Large Bent-winged Bat (both listed under the BC Act) are dual credit species (ecosystem/species) whereby the foraging habitat is offset through ecosystem credits and the breeding habitat is offset through species credits. The Site is likely to contain breeding habitat (suitable sized hollow-bearing trees) for the Glossy Black-Cockatoo but not for Large Bent-winged Bat (this species requires caves for breeding).

The Large-eared Pied Bat, listed as Vulnerable under the EPBC Act, is a species credit species and would require offsetting through the retirement of species credits. Both breeding and foraging habitats (within 2 km of caves) would be subject to species credit requirements where present within the Site. However, no potential breeding habitat was detected during the field survey and the species' use of the Site is likely to be limited to foraging only. It is noted that the Large-eared Pied Bat was detected within the Site at one location (Figure 5). Two calls were recorded which had the characteristic frequency of the species but lacked good alternation in pulses within the call sequence to allow for a non-definitive identification of the species.

All remaining threatened species recorded are ecosystem credit species and would be offset via the offset liability associated with the PCTs.

3.3 Fauna habitat

3.3.1 Grazed paddocks

Grasslands comprise the majority of the Site. The paddocks were predominantly native grasslands, where trees have been removed in the past to make way for grazing activities i.e. the derived native grassland (DNG) condition states identified (Table 3). Dominant grass species include the native Spear Grass (*Austrostipa* sp.), Wallaby Grass (*Rytidosperma* sp.), Kangaroo Grass (*Themeda triandra*) and Tussock Grass (*Poa* sp.), as well as native forbs. Shrubs were generally absent. Weeds, including St John's Wort (*Hypericum perforatum*), Purpletop (*Verbena* sp.) and Serrated Tussock (*Nassella trichotoma*), comprised some portions of the Site. Surface and embedded rocks were common throughout this habitat type.

This habitat is generally suitable for Golden Sun Moth given the presence of native grass species including Wallaby Grass (*Rytidosperma* sp.) and Spear Grass (*Austrostipa* sp.). However, grasslands within the Site currently support high amounts of biomass resulting in reduced inter-tussock space and limited availability of bare ground, as is preferred by the species.

3.3.2 Dry woodland

Dry woodland is scattered throughout the Site. This habitat typically comprised a mixture of canopy species including White Box (*Eucalyptus albens*), Yellow Box (*Eucalyptus melliodora*), Red Stringybark (*Eucalyptus macrorhyncha*) and Black Cypress Pine (*Callitris endlicheri*). Less common tree species included Rough-barked Apple (*Angophora floribunda*), Kurrajong (*Brachychiton populneus*), Ironbark (*Eucalyptus* sp.), Blakey's Red Gum (*Eucalyptus blakelyi*), Red Box (*Eucalyptus polyanthemos*) and Allocasuarina (*Allocasuarina* sp.). The shrub layer was scattered and typically comprised Black Cypress Pine and Hop-bush (*Dodonaea* sp.). The understorey was dominated by native grasses and forbs. The ground layer typically had rocks present, leaf litter and fallen timber. Some of the trees present contained hollows, though these were predominantly located in the low-lying areas and slopes.

Overall, habitat conditions were generally fragmented and lacked old-growth trees. Past and current land uses include grazing sheep and cattle.

The dry woodland areas present within the Site are considered to be low-moderate habitat quality for native fauna.

3.3.3 Aquatic habitats

Aquatic habitat is present within the Site in the form of farm dams, ephemeral creeks and drainage lines. Some of the farm dams were well vegetated and had fringing, emergent and floating vegetation, which provides moderate quality habitat for native fauna. Several creeks intersecting the Site had varying degrees of habitat for native fauna. One of the higher quality creeks included the Yarraman Creek flowing west from the central parts of the Site. Yarraman Creek had some shading, some shrubs and emergent and fringing vegetation, and has the potential to provide habitat for the threatened Purple Spotted Gudgeon. Other creeks were more degraded and were a series of ponds and showed signs of disturbance from Feral Pig (*Sus scrofa*) activities.

4. Avoidance and minimisation strategies

Reasonable measures to avoid or minimise the clearing of native vegetation and threatened species habitat must be demonstrated by the proponent as a part of the biodiversity assessment and can assist in lowering the credit offset obligation associated with the Project. Avoidance and minimisation strategies for impacts on biodiversity identified as having a moderate to high likelihood of occurrence within the Site are detailed in Table 4.

Table 4. Avoidance and minimisation strategies for impacts on biodiversity

Matter	Avoidance and minimisation strategies
Threatened ecological communities	• Minimise clearing of PCTs conforming to a TEC. • Where clearing cannot be avoided, prioritise disturbance within existing cleared or disturbed variants of the PCT (i.e. derived native grassland and low condition). • Partial clearing methods adopted as a preference for total clearing where impacts cannot be reasonably avoided.
Threatened fauna	• Undertake targeted surveys to confirm presence/absence of candidate threatened fauna as documented in Table 2. • Disturbance within exotic dominated or disturbed areas should be prioritised where practicable. • Undertake a hollow-bearing tree survey to record the location of all potential breeding habitats for hollow-dwelling threatened fauna species including Superb Parrot and owl species. • Minimise the clearing of hollow-bearing trees wherever practicable and ensure a 100 m[3] setback to confirmed breeding hollows is maintained wherever possible. • Minimise the clearing of winter and spring foraging habitats for Grey-headed Flying-fox wherever practicable. • Identify caves, scarps, cliffs, rock overhangs and disused mines within 100 m of the development layout. ▪ Where potential breeding habitats are identified for threatened microbats, undertake targeted surveys using harp traps from mid-November to the end of January to confirm breeding individuals, in accordance with the 'species credit' threatened bats and their habitats: NSW survey guide for the Biodiversity Assessment Method (OEH 2018). ▪ Where breeding is confirmed in target microbat species, all proposed works are to be setback at least 100 m from breeding habitat. • Targeted surveys carried out for birds and bats to confirm utilisation of habitats within the Site and quantify any potential risk of turbine collision, a prescribed impact under the BC Act. • Maintain a maximum clearance between the rotor swept paths of turbines and adjacent tree canopy wherever possible to minimise bird and bat collision risks.
Threatened flora	• Undertake targeted surveys within the Project footprint to confirm presence/ absence within potential habitat for candidate threatened flora species, as documented in Table 2. Surveys should be carried out in accordance with DPIE's (2020) survey guideline: *Surveying threatened plants and their habitats: NSW survey guide for the Biodiversity Assessment Method*. • Avoid clearing within any confirmed habitats wherever practicable.
General	General measures that may assist with reducing biodiversity impacts associated with the Project include: • Quarantining and cleaning of plant and machinery prior to entry to the Site. Once present within the Site, machinery would stay at site until the proposed works are completed. Machinery should be washed down prior to leaving site.

[3] In accordance with the NSW Department of Planning, Industry and Environment's (DPE) TBDC database.

Matter	Avoidance and minimisation strategies
	• The enforcement of strict exclusion zones, particularly within areas of high biodiversity value i.e. TEC and/or high quality native vegetation • Partial clearing methods adopted as a preference for total clearing where impacts cannot be reasonably avoided. • Rapid rehabilitation of temporarily cleared areas with native plants endemic to the locality • Placing any dead wood and dead trees removed as part of the Project within a suitable location nearby to compensate for any habitat removal. • Water carts should be used to suppress dust, particularly in dry times and during high winds. • Sediment and erosion control devices strategically placed to protect the receiving water bodies, particularly those permanent flowing drainage lines.

4.1 Targeted threatened species survey

Habitat mapping and targeted surveys would be required to determine the presence/absence of threatened candidate species listed in Table 2 within potential habitat located within the Site. These species may be excluded from further consideration within the BAM-C where suitable habitat is not recorded as a part of further survey works.

Flora species listed in Table 2 may be removed as candidate species through targeted survey, provided such survey is conducted between the months of September to November to allow for identification of threatened flora with narrow survey windows in areas of moderate or better condition habitat. In addition, these species may be excluded from the BAM-C based on available habitat being too degraded for these species to occur.

Hollow-bearing trees within the Site that contain suitable hollow sizes have the potential to be used by one or more hollow-dependent species credit species. Some of the fauna listed in Table 2 may be able to be excluded based on hollow size specified in the NSW BioNet Threatened Biodiversity Profile Data Collection. Isolated paddock trees are unlikely to provide habitat for hollow-dependant species credit species, depending on their distance from a larger patch of vegetation. These trees are more likely to be utilised by mobile hollow nesting birds and bats that are ecosystem credit species (with the exception of Superb Parrot).

Areas of potential reptile habitat for Striped Legless Lizard (*Delma impar*) have been identified within the Site due to the presence of suitable surface rock and encompassing native vegetation. This species mainly occurs within areas of north facing grassland. Targeted surveys in suitable grassland habitat is considered appropriate to confirm presence or otherwise for the Striped Legless Lizard. We recommend tile grid surveys are adopted as the preferred survey method for this species.

If impacts to streams or waterbodies are anticipated, amphibian and fish surveys may be required. Many of the other amphibians listed in Appendix 1 could likely be removed from the assessment based on the absence of potential habitat within the Site.

5. Project impacts

An assessment of likely Project impacts to biodiversity is provided in Table 5. Project Impacts are categorised as direct or indirect as described in DPIE (2020), which states:

"Direct impacts are those that directly affect habitat and individuals. They include, but are not limited to, death through predation, trampling, poisoning of the animal/plant itself and the removal of suitable habitat. When applying each factor, consideration must be given to all of the likely direct impacts of the proposed activity or development.

Indirect impacts occur when project-related activities affect species, populations or ecological communities in a manner other than direct loss. Indirect impacts can include loss of individuals through starvation, exposure, predation by domestic and/or feral animals, loss of breeding opportunities, loss of shade/shelter, deleterious hydrological changes, increased soil salinity, erosion, inhibition of nitrogen fixation, weed invasion, fertiliser drift, or increased human activity within or directly adjacent to sensitive habitat areas. As with direct impacts, consideration must be given, when applying each factor, to all of the likely indirect impacts of the proposed activity or development."

Table 5: Direct and indirect impacts associated with the Project

Impact	Description	Risk
Direct impacts		
Removal or modification of native vegetation	Impacts to 401.4ha of native vegetation and suitable habitat for potentially occurring threatened species. A portion of this clearing footprint would be partial (i.e. limited to the canopy and midstorey layers) or subject to regeneration post construction.	High
Loss of threatened ecological communities	Impacts to 78.85 ha of critically endangered White Box Yellow Box Blakely's Red Gum Woodland. Impacts to 0.02 ha of Inland Grey Box Woodland.	High
Loss of individuals of a threatened species	Further survey could identify threatened flora species within the preliminary development footprint.	Moderate
Indirect impacts		
Changed hydrology	Bridges and crossings will be managed to avoid any permanent changes to watercourse and flow would be maintained.	Low (mitigated)
Sedimentation and erosion	Clearing within areas of high erosion potential would be minimised and suitable construction measures (i.e. seeding, erosion blankets, sediment basins, etc) implemented.	Low (mitigated)
Weed invasion	Construction and operational activities have the potential to increase spread of invasive species through the mobilisation and/ or introduction of weed propagules. Further survey is recommended to map problem weed areas within the Site. Suitable control measures would be implemented during and post construction to reduce and minimise the spread of weed species within the Site.	Moderate (mitigated)
Habitat disturbance from noise and increased human activity	Increased traffic and personnel within, and adjacent to, the critically endangered White Box Yellow Box Blakely's Red Gum Woodland.	Moderate (mitigated)
Edge effects	These include changes in the structure and composition of vegetation communities immediately adjacent to the clearing footprint.	Moderate

The assessment was informed by the preliminary development footprint which incorporated three clearing zones as detailed in Table 6 and shown in Figure 6. Complete loss of vegetation due to ground disturbance for the installation of infrastructure has been assumed within the Full Clearing Zone (FCZ). The Easement Clearing Zone (ECZ) and Hazard Tree Zone (HTZ) would be subject to partial clearing around project infrastructure for operational and safety reasons. A description of the vegetation attributes that would be affected within these zones is provided in Table 6.

Table 6: Clearing zones and future VI

Clearing activity/ management zone	Definition	Attributes with total loss	Attributes with partial or no loss	Estimated future VI
Full Clearing Zone (FCZ)	Lands subject to total clearing and ground disturbance, including within: • 30m of turbines • 3m of access tracks • The footprint of the BESS, O&M and substation facilities.	Total clearing of trees, shrubs and groundcovers. Future VI set to zero for all attributes related to composition, structure and function	None	0
Easement Clearing Zone (ECZ)	Lands where clearing and ongoing maintenance of tall growing vegetation would be undertaken, including within: • 30-100m of turbines • 20m of transmission lines.	Composition and structure attributes: • Trees and shrubs continually removed as part of long-term maintenance – tree and shrub growth forms set to zero. • Fern and 'Other' growth forms would remain in situ but are likely to be reduced as a result of changed environmental conditions. Function attributes: • Tree stem classes, large trees and hollow trees reduced to zero • Leaf litter and the length of fallen logs is expected to reduce significantly over time with the absence of a tree canopy.	Composition and structure attributes: • Grass and forb growth forms remain in-situ and would retain current VI condition.	30
Hazard Tree Zone (HTZ)	Lands situated between 20-30m from the proposed transmission line, where selective tree removal, trimming or lopping would be undertaken to manage any risk of damage to	Function attributes: • The Stem class for 50-79 cm and number of large trees (>50 cm DBH) reduced to zero	Composition and structure attributes: • Structure of tree growth form to be reduced. • All other growth-forms remain in-situ, including shrubs and ground growth forms which would retain current VI condition	50 for low condition and moderate condition zones; 40 for Derived Native Grasslands.

Clearing activity/ management zone	Definition	Attributes with total loss	Attributes with partial or no loss	Estimated future VI
	infrastructure in the event of tree fall.			

5.1 Direct impacts

The Project has the potential to directly impact approximately 401.4 ha of native vegetation, as well as suitable habitat for one or more threatened species (285.12 ha of derived native grassland and 116.28 ha of dry woodland). This includes 394.67 ha of vegetation within, and 6.73 ha of vegetation outside, the Site. Table 7 presents a summary of clearing impacts for each clearing zone. The condition of impacted vegetation ranges from moderate to modified/exotic grasslands. It is estimated that 291.79 ha of non-native vegetation will require disturbance.

Approximately 78.85 ha of critically endangered White Box Yellow Box Blakely's Red Gum Woodland would be subject to clearing. Of this, 26.32 ha (33%) would be fully cleared and another 52.53 ha (67%) would be subject to partial clearing (Table 7). Approximately 0.02 ha of Inland Grey Box Woodland would also be subject to full clearing. No other TECs would be impacted.

There is a moderate risk that the Project would result in the direct loss of threatened flora species, should these occur within the Site and be subject to clearing for construction and/or operation.

5.2 Indirect impacts

Potential indirect impacts associated with the Project would include changes to hydrology, sedimentation and erosion, weed invasion, edge effects and habitat disturbance from noise and increased human activity. These impacts would largely be associated with the construction phase and limited wherever practicable through the implementation of appropriate construction controls.

5.3 Prescribed Impacts

Prescribed biodiversity impacts, as per clause 6.1 of the BC Regulation, are also subject to assessment. These include:

- The impacts of development on the following habitat of threatened species or ecological communities:
  - Karst, caves, crevices, cliffs and other geological features of significance
  - Rocks
  - Human made structures
  - Non-native vegetation.
- The impacts of development on the connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range
- The impacts of development on movement of threatened species that maintains their lifecycle
- The impacts of development on water quality, water bodies and hydrological processes that sustain threatened species and threatened ecological communities (including from subsidence or upsidence resulting from underground mining or other development)
- The impacts of wind turbine strikes on protected animals
- The impacts of vehicle strikes on threatened species of animals or on animals that are part of a threatened ecological community.

Of most relevance to the Project is wind turbine strikes on threatened and protected animals. Table 2 identifies threatened bird species with a moderate to high likelihood of occurrence which may utilise the

Site as a potential flyway or migration route. Other protected animals including the following will also need to be confirmed for the Site as a part of future targeted surveys:

- resident threatened aerial species
- resident raptor species
- nomadic and migratory species that are likely to fly over the Site.

While stick nests were surveyed for during the field survey, none were observed. However, it is considered highly likely that raptors are nesting within the Site given Wedge-tailed Eagle (*Aquila audax*) pairs were recorded. One migratory species, the White-throated Needletail (*Hirundapus caudacutus*), is also likely to occur and may be impacted.

There is also the potential for the Project to have an impact on threatened species as a result of vehicle strikes (during both construction and operation) and on water bodies that are found to support threatened species e.g. Purple Spotted Gudgeon.

Targeted seasonal surveys will need to be undertaken to confirm the presence/absence of any threatened and protected (in regard to wind farm developments only) animals, following the survey methodology outlined in Section 5.3 of the BAM.

5.4 Serious and Irreversible impacts (SAIIs)

Serious and Irreversible impact candidate species with the potential to occur within the Site have been identified in Appendix 1. There are four SAII candidate species with a moderate or higher likelihood of occurrence:

- *Euphrasia arguta*
- Regent Honeyeater (*Anthochaera Phrygia*)
- Swift Parrot (*Lathamus discolor*)
- Large-eared Pied Bat (*Chalinolobus dwyeri*).

With regard to the Swift Parrot and Regent Honeyeater, it is noted that no Important Areas[4] have been mapped within the Site (DPE 2023a). Therefore the Project would not impact breeding habitat and is unlikely to trigger an SAII in regard to these species.

For an SSD application the consent authority can grant consent to a proposal which is likely to have SAIIs; however, if consent is to be granted they must take those impacts into consideration and determine whether there are any additional and appropriate measures that will minimise those impacts.

[4] In this context, Important Areas means those shown on a map approved by the DPIE that identifies areas of habitat that are considered to be important for the survival of a threatened species in the wild. Species that have areas of important habitat mapped are identified in the Threatened Biodiversity Data Collection.

Table 7: Clearing impacts and estimated ecosystem credits

PCT	Condition class	BC Act Status	EPBC Act status	% Cleared	ECZ (ha)	FCZ (ha)	HTZ (ha)	Grand Total (ha)	Estimated VI	Estimated Future VI
Within Site boundary										
0	Non-native	N/A	N/A	N/A	0.22	11.62	0.05	11.89	<15	N/A
266	Derived Native Grassland	CEEC	CEEC	94	0.29	0.58	0.00	0.87	40	ECZ-30; FCZ-0; HTZ-40
266	Low	CEEC	CEEC	94	2.49	2.11	0.00	4.59	50	ECZ-30; FCZ -0; HTZ-50
266	Moderate	CEEC	CEEC	94	1.61	0.37	0.00	1.98	70	ECZ-40; FCZ -0; HTZ-50
267	Moderate	CEEC	CEEC, EEC	94	0.00	0.02	0.00	0.02	70	ECZ-40; FCZ -0; HTZ-50
272	Moderate	N/A	N/A	64	0.00	0.09	0.00	0.09	70	ECZ-40; FCZ -0; HTZ-50
277	Derived Native Grassland	CEEC	CEEC	94	26.60	10.27	0.48	37.35	40	ECZ-30; FCZ -0; HTZ-40
277	Moderate	CEEC	CEEC	94	1.19	0.14	0.32	1.65	70	ECZ-40; FCZ -0; HTZ-50
278	Moderate	CEEC	CEEC	80	0.00	0.01	0.00	0.01	70	ECZ-40; FCZ -0; HTZ-50
281	Derived Native Grassland	CEEC	CEEC	67	2.09	0.33	0.00	2.43	40	ECZ-30; FCZ -0; HTZ-40
281	Low	CEEC	CEEC	67	0.73	0.41	0.42	1.56	50	ECZ-30; FCZ -0; HTZ-50
281	Moderate	CEEC	CEEC	67	3.09	1.72	0.00	4.81	70	ECZ-40; FCZ -0; HTZ-50
287	Moderate	N/A	N/A	67	4.56	1.76	0.00	6.32	70	ECZ-40; FCZ -0; HTZ-50
347	Moderate	CEEC	CEEC	63	0.00	0.09	0.00	0.09	70	ECZ-40; FCZ -0; HTZ-50
461	Derived Native Grassland	N/A	N/A	50	156.97	63.70	18.05	238.73	40	ECZ-30; FCZ -0; HTZ-40

PCT	Condition class	BC Act Status	EPBC Act status	% Cleared	ECZ (ha)	FCZ (ha)	HTZ (ha)	Grand Total (ha)	Estimated VI	Estimated Future VI
461	Low	N/A	N/A	50	45.24	10.45	3.16	58.85	50	ECZ-30; FCZ -0; HTZ-50
461	Moderate	N/A	N/A	50	11.82	4.34	0.98	17.14	70	ECZ-40; FCZ -0; HTZ-40
511	Moderate	CEEC	CEEC	0	0.00	0.15	0.00	0.15	70	ECZ-40; FCZ -0; HTZ-50
1330	Moderate	CEEC	CEEC	94	13.23	4.81	0.00	18.03	70	ECZ-40; FCZ -0; HTZ-50
Outside Site boundary										
0	Non-native	N/A	N/A	N/A	0.00	3.85	0.00	3.85	<15	N/A
266	Derived Native Grassland	CEEC	CEEC	94	0.00	0.01	0.00	0.01	40	ECZ-30; FCZ -0; HTZ-40
272	Derived Native Grassland	N/A	N/A	64	0.00	0.02	0.00	0.02	40	ECZ-30; FCZ -0; HTZ-40
277	Derived Native Grassland	CEEC	CEEC	94	0.00	4.52	0.00	4.52	40	ECZ-30; FCZ -0; HTZ-40
277	Low	CEEC	CEEC	94	0.00	0.11	0.00	0.11	50	ECZ-30; FCZ -0; HTZ-50
277	Moderate	CEEC	CEEC	94	0.00	0.02	0.00	0.02	70	ECZ-40; FCZ -0; HTZ-50
281	Derived Native Grassland	CEEC	CEEC	67	0.00	0.03	0.00	0.03	40	ECZ-30; FCZ -0; HTZ-40
281	Moderate	CEEC	CEEC	67	0.00	0.62	0.00	0.62	70	ECZ-40; FCZ -0; HTZ-50
287	Moderate	N/A	N/A	67	0.00	0.01	0.00	0.01	70	ECZ-40; FCZ -0; HTZ-50
461	Derived Native Grassland	N/A	N/A	50	0.01	1.15	0.00	1.17	40	ECZ-30; FCZ -0; HTZ-40
461	Low	N/A	N/A	50	0.00	0.18	0.00	0.18	50	ECZ-30; FCZ -0; HTZ-50
461	Moderate	N/A	N/A	50	0.00	0.04	0.00	0.04	70	ECZ-40; FCZ -0; HTZ-50

PCT	Condition class		BC Act Status	EPBC Act status	% Cleared	ECZ (ha)	FCZ (ha)	HTZ (ha)	Grand Total (ha)	Estimated VI	Estimated Future VI
	270.14	123.54	23.45	417.13				3513			

5.5 Aquatic impacts

The Project is likely to have a low impact on the drainage lines present within the Site, including habitat disturbance and impacts to water quality. The proposed tracks are expected to cross Staircase Creek, Gulf Creek, Yarraman Creek and Shawns Creek. As Yarraman Creek is considered to likely provide suitable habitat for the Purple Spotted Gudgeon there is the potential for this species' habitat to be directly affected.

Impacts would primarily be restricted to the construction phase and associated installation of waterway crossings. Waterway crossing methods and construction management measures should align with those detailed in the *Fisheries NSW Policy and Guidelines for Fish Habitat Conservation and Management* (Fairfull 2013) to mitigate any residual risk to aquatic habitats.

Aquatic impacts associated with the Project would need to be assessed through completion of an Assessment of Significance (7-part test) under Part 221ZV of the FM Act.

5.6 Key threatening processes

Five Key Threatening Processes (KTPs) that are listed on the BC Act and/or EPBC Act as of February 2022 (as applicable to terrestrial environments) are likely to be exacerbated by the Project (Table 8).

Table 8: Key threatening processes

Key Threatening Process	BC Act	EPBC Act equivalent	Potential to be exacerbated due to the Project
1. Bushrock removal	√	x	Moderate - to be avoided where feasible or salvaged and relocated to nearby suitable habitat.
2. Clearing of native vegetation	√	√	High - clearing of 401.4 ha of native vegetation
3. Invasion of native plant communities by exotic perennial grasses	√	(only N. Aust)	Moderate
4. Loss of hollow-bearing trees	√	x	High
5. Removal of dead wood and dead trees	√	x	Moderate

6. Matters of National Environmental Significance

6.1 Assessment of significance

Matters of National Environmental Significance (MNES) likely or known to occur within the Site include TECs, threatened and migratory species, as documented within Section 3 of this report. No other MNES are considered relevant to the Project.

6.1.1 Threatened species and ecological communities

All relevant MNES will be subject to further survey and assessment in accordance with the BAM as a part of the Project EIS. . For the purpose of the EPBC Act referral, it is assumed that the Project would have a significant impact on relevant threatened species and communities as documented within Section 3 of this report.

6.1.2 Migratory species

The site is within the known distribution of the White-throated Needletail (*Hirundapus caudacutus*) and contains potential habitat for this species within approximately 4,004.59 ha of dry woodlands (45% of the Site).

An assessment of significance was undertaken in accordance with the Commonwealth Significant Impact Criteria 1.1 (DOE 2013) to assess the potential for a significant impact to White-throated Needletail as a result of the Project. The assessment was informed by the *EPBC Act referral guidelines for 14 birds listed migratory under the EPBC* Act (DoE 2015). According to DoE (2015), an activity is likely to impact an ecologically significant proportion[6] of a White-throated Needletail population where 10 or more individuals are impacted within the population. Considering the species aerial flying behaviour and the presence of suitable habitat within the Site, the chances of more than 10 White-throated Needletail mortalities as a result of wind turbine collision over the life of the development would be considered likely where the species is confirmed to occur within the site.

The results of the assessment are presented in Attachment 2. Targeted surveys are recommended to confirm to what extent habitats within the Site are utilised or traversed by White-throated Needletail and any subsequent turbine collision risks.[5]

[5] An ecological significant proportion of a population is the proportion to which an impact will result in a serious disruption (i.e. breeding feeding, migration or resting) to the lifecycle of the species population (DoE, 2015). It is estimated based on published estimates of area occupied and recorded densities published in the Handbook of Australian, New Zealand and Antarctic Birds.

7. Offsetting

The Project is likely to require a biodiversity offset for both BC Act and EPBC Act listed threatened entities as detailed Section 5. In relation to satisfying offsets for State and Commonwealth matters, the Australian Government has formally endorsed the NSW Biodiversity Offsets Scheme (and use of the BAM [DPE, 2020a] as the methodology for calculating biodiversity credit requirements) through the EPBC Act Condition-setting Policy (DAWE, 2020), which allows the NSW Biodiversity Offsets Scheme to be applied to assess and meet biodiversity offset requirements for a project.

The biodiversity offset for each entity would be met according to the rules as detailed in Division 6.2 of the BC Regulation which sets out the offset rules under the Biodiversity Offsets Scheme. The rules include retiring like-for-like credits, funding conservation actions that directly benefit the species or community impacted, paying into the Biodiversity Conservation Fund (BCF) the value of the credits and application of variation rules, which allow for suitable offsets to be determined where it can be demonstrated that like-for-like offsets cannot be obtained (noting that the variation rules cannot be applied in relation to MNES).

8. Summary

The results of this Preliminary Biodiversity Assessment indicate:

- Ten PCTs, PCT 266, PCT 267, PCT 268, PCT 277, PCT 278, PCT 279, PCT 281, PCT 283, PCT 347, PCT 483, PCT 511 and PCT 1330, recorded and mapped within the Site align to the Critically Endangered White Box Yellow Box Blakely's Red Gum Woodland TEC. All condition classes of these PCTs are considered to align with both the Commonwealth and State listings.
- Two PCTs mapped within the Site (PCT 81 and PCT 267) align with the Endangered Inland Grey Box Woodland.
- Ten threatened fauna species were recorded during the survey:
  - Diamond Firetail (ecosystem credit species)
  - Dusky Woodswallow (ecosystem credit species)
  - Speckled Warbler (ecosystem credit species)
  - Varied Sittella (ecosystem credit species)
  - Glossy Black-Cockatoo (dual credit species – ecosystem [foraging]/species [breeding])
  - Large-eared Pied Bat (species credit species)
  - Little Bent-winged Bat (dual credit species – ecosystem [foraging]/species [breeding])
  - Large Bent-winged Bat (dual credit species – ecosystem [foraging]/species [breeding])
  - Yellow-bellied Sheathtail-bat (ecosystem credit species)
  - Greater Broad-nosed Bat (ecosystem credit species).
- No threatened flora was identified during the field survey.
- A total of 19 threatened flora species and 22 threatened fauna species have been considered as candidate species as part of this assessment. These threatened flora and fauna species are considered to have a moderate or higher likelihood of occurrence in the Site (Table 2).
- Two of the candidate species are at risk of SAII:
  - *Euphrasia arguta*
  - Large-eared Pied Bat (*Chalinolobus dwyeri*).
- Yarraman Creek provides potential habitat for the Purple Spotted Gudgeon (Endangered under the FM Act).
- No stick nests/raptor nests observed, though raptors are likely to nest within the Site given resident Wedge-tailed Eagle pairs were observed during the field survey. Given this, the Project may have prescribed impacts (wind turbine strikes) on threatened and protected species under the BC Act and EPBC Act.
- Based on the results of this assessment, it is considered likely that the Project would have a significant impact on the White Box Yellow Box Blakely's Red Gum Woodland TEC. A detailed assessment against the MNES guidelines would be presented as part of the Project EIS.
- Assessment against the Commonwealth Significant Impact Criteria 1.1 (DOE 2013) indicates the Project may result in a significant impact to White-throated Needletail as a result of potential wind turbine collision. Further surveys are recommended to confirm if habitats within the Site are utilised or traversed by the species.
- The Project has the potential to result in a significant impact to the threatened flora and species listed in Table 2 for the purpose of the EPBC Act referral. This would be revised as a part of the Project EIS following further survey and assessment carried out in accordance with the BAM.
- The Project will require referral under the EPBC Act and is likely to be considered a controlled action.

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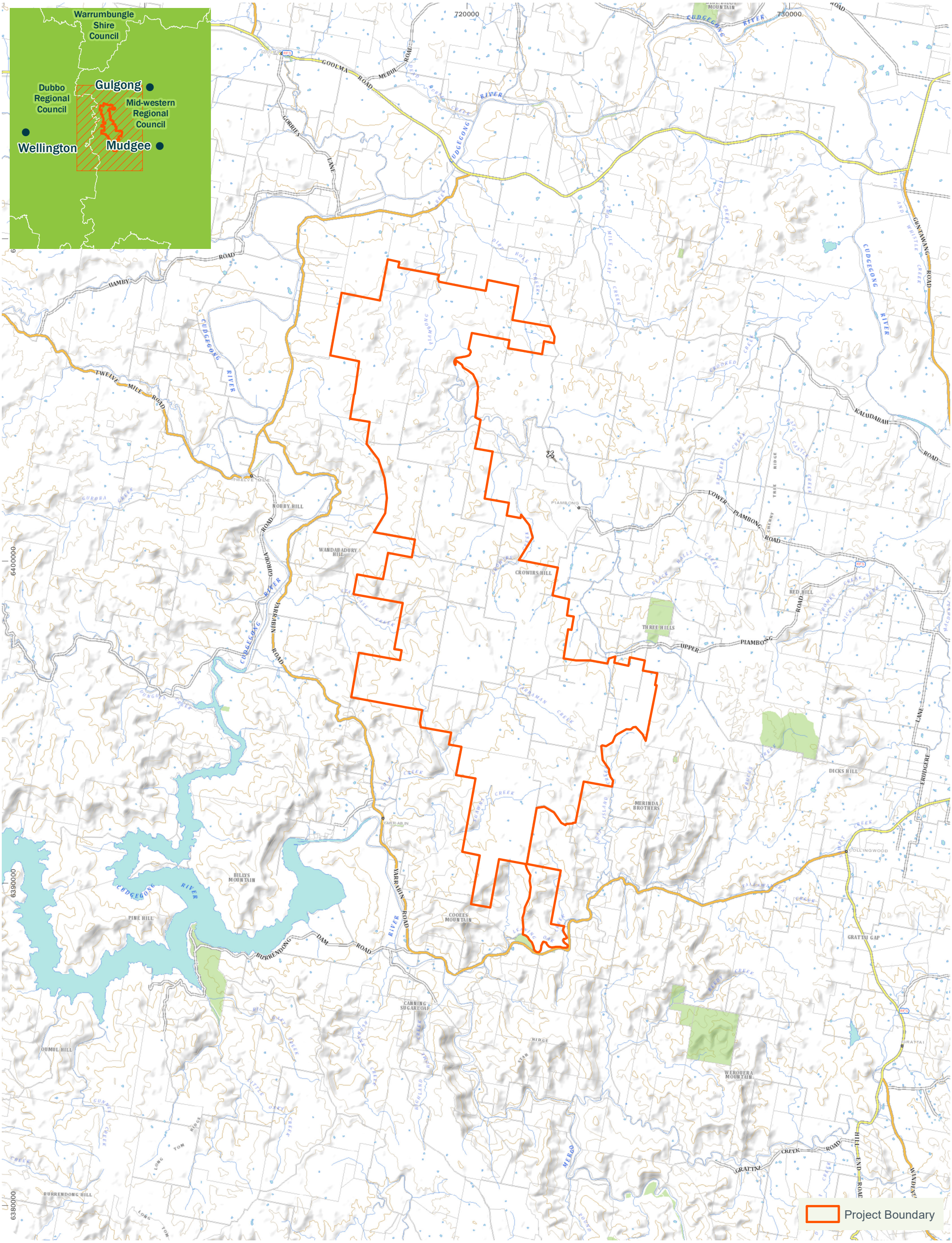
Figures



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0 1.5 km

GDA 1994 MGA Zone 55

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Client: AECOM Australia Pty Ltd

Location Map

Piambong Wind Farm Preliminary Biodiversity Assessment

Figure 1

public/NSW_Base_Map: © Department of Customer Service 2020

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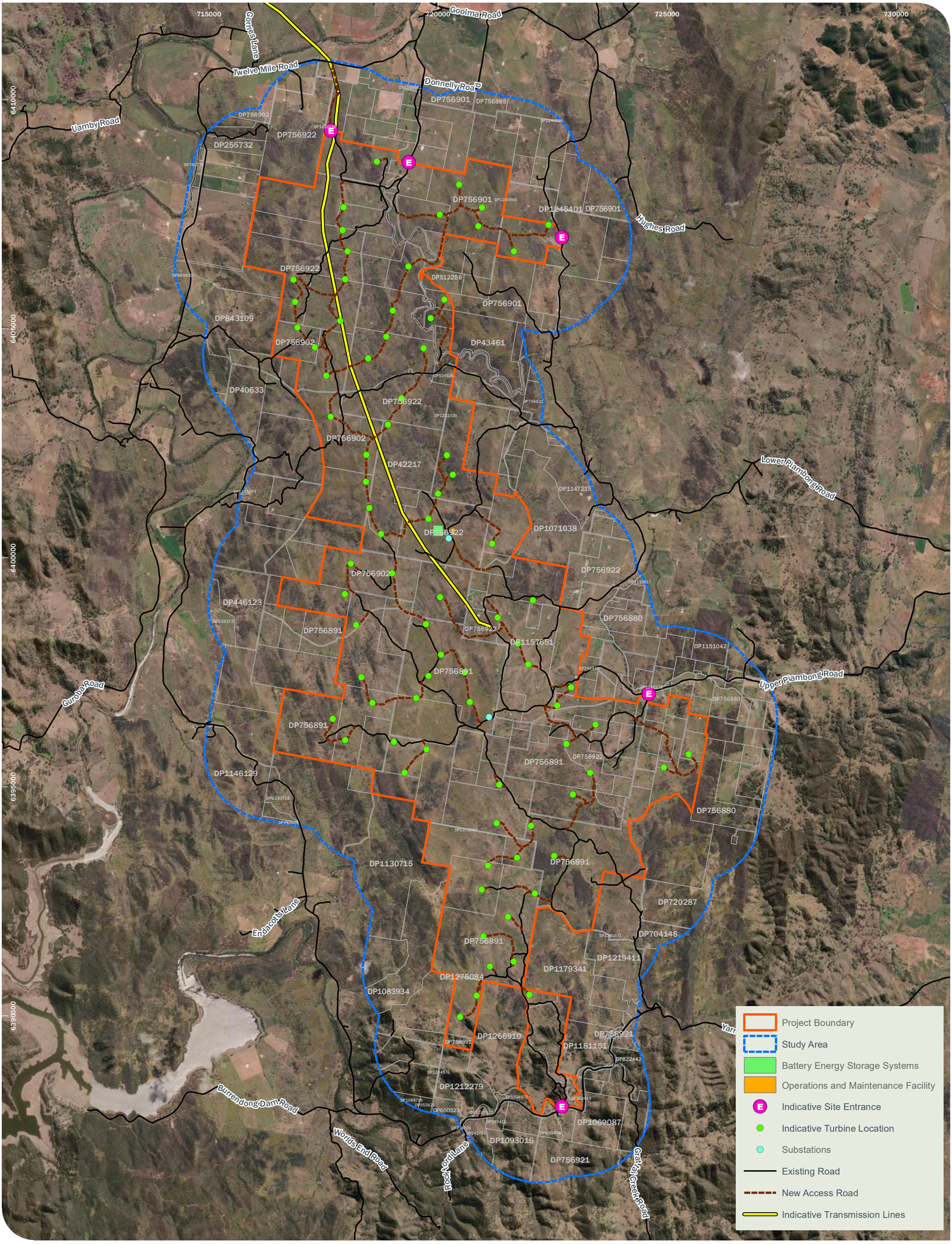

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Client: AECOM Australia Pty Ltd

Study Area

Piambong Wind Farm Preliminary Biodiversity Assessment

Figure 2

World Imagery: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

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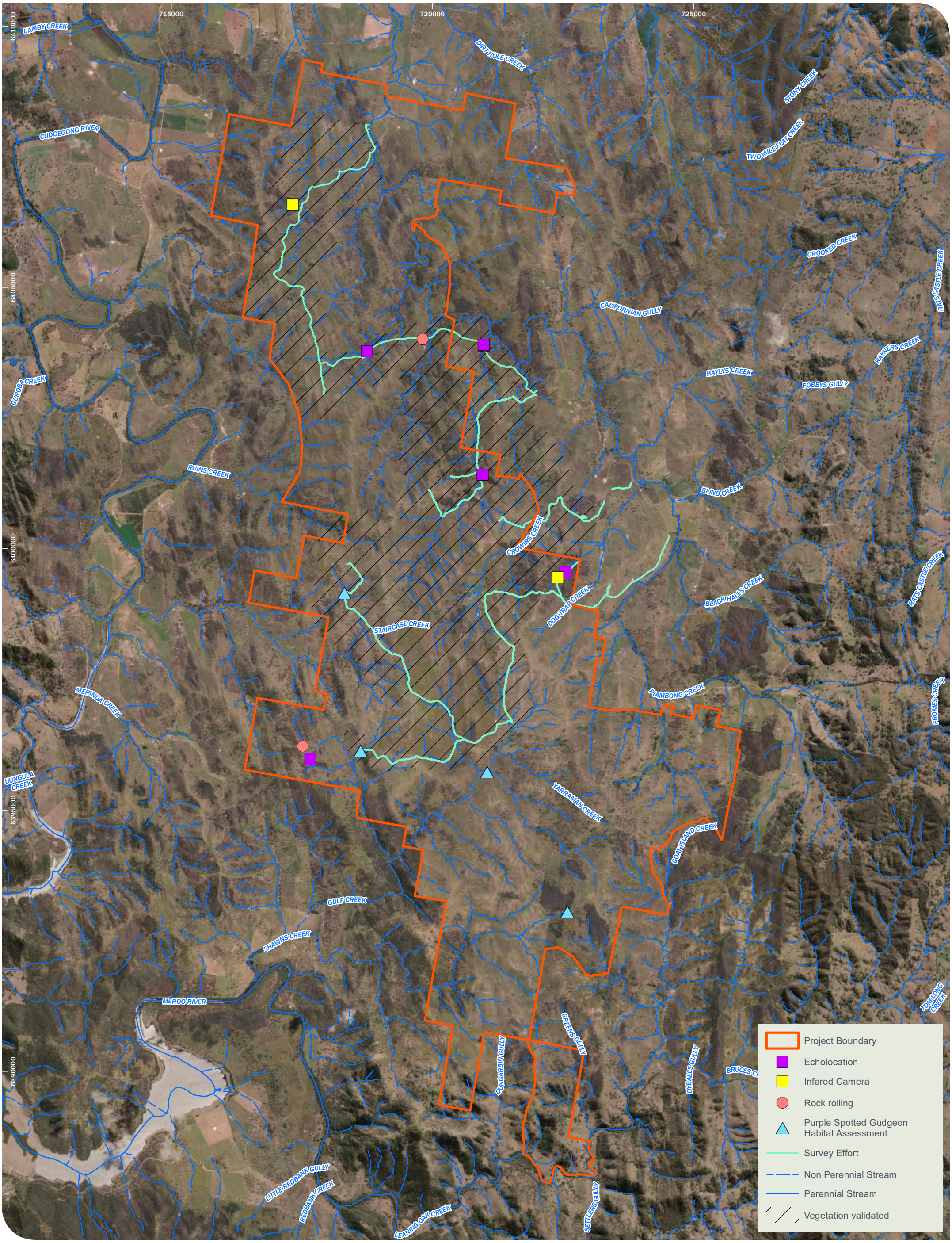

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GDA 1994 MGA Zone 55

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Niche Proj. #: 6889
Client: AECOM Australia Pty Ltd

Survey Methods

Piambong Wind Farm Preliminary Biodiversity Assessment

Figure 3

World Imagery: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

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v2.0

710000 715000 720000 725000 730000

6405000 6400000 6395000 6390000 6385000

Project Boundary

Niche Vegetation Mapping

PCT, Condition class

- 0: Not Native
- 1330: Yellow Box - Blakelys Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion, Moderate
- 186: Dwyers Red Gum - Black Cypress Pine - Currawang shrubby low woodland on rocky hills mainly in the NSW South Western Slopes Bioregion, Derived Native Grassland
- 186: Dwyers Red Gum - Black Cypress Pine - Currawang shrubby low woodland on rocky hills mainly in the NSW South Western Slopes Bioregion, Moderate
- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion, Derived Native Grassland
- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion, Low
- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion, Moderate
- 267: White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion, Derived Native Grassland
- 267: White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion, Moderate
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes, Derived Native Grassland
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes, Low
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes, Moderate
- 277: Blakelys Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion, Derived Native Grassland
- 277: Blakelys Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion, Low
- 277: Blakelys Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion, Moderate
- 278: Riparian Blakelys Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion, Moderate
- 279: Blakelys Red Gum - White Cypress Pine woodland on footslopes of hills in central part of the NSW South Western Slopes Bioregion, Moderate
- 281: Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion, Derived Native Grassland
- 281: Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion, Low
- 281: Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion, Moderate
- 283: Apple Box - Blakelys Red Gum moist valley and footslopes grass-forb open forest of the NSW South Western Slopes Bioregion, Moderate
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion, Moderate
- 331: Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion, Moderate
- 332: Tumbledown Red Gum - Black Cypress Pine - Red Stringybark woodland on rocky hills in the NSW central western slopes, Moderate
- 347: White Box - Blakelys Red Gum shrub/grass woodland on metamorphic hillslopes in the mid-southern part of the upper slopes sub-region of the NSW South Western Slopes Bioregion, Low
- 347: White Box - Blakelys Red Gum shrub/grass woodland on metamorphic hillslopes in the mid-southern part of the upper slopes sub-region of the NSW South Western Slopes Bioregion, Moderate
- 461: Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion, Derived Native Grassland
- 461: Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion, Low
- 461: Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion, Moderate
- 477: Inland Scribbly Gum - Red Stringybark - Black Cypress Pine - Red Ironbark open forest on sandstone hills in the southern Brigalow Belt South Bioregion and northern NSW South Western Slopes Bioregion, Moderate
- 478: Red Ironbark - Black Cypress Pine - stringybark +/- Narrow-leaved Wattle shrubby open forest on sandstone in the Gulgong - Mendooran region, southern Brigalow Belt South Bioregion, Moderate
- 511: Queensland Bluegrass - Redleg Grass - Rats Tail Grass - spear grass - panic grass derived grassland of the Nandewar Bioregion and Brigalow Belt South Bioregion, Derived Native Grassland
- 511: Queensland Bluegrass - Redleg Grass - Rats Tail Grass - spear grass - panic grass derived grassland of the Nandewar Bioregion and Brigalow Belt South Bioregion, Moderate
- 81: Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion, Moderate
- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion, Moderate

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GDA 1994 MGA Zone 55

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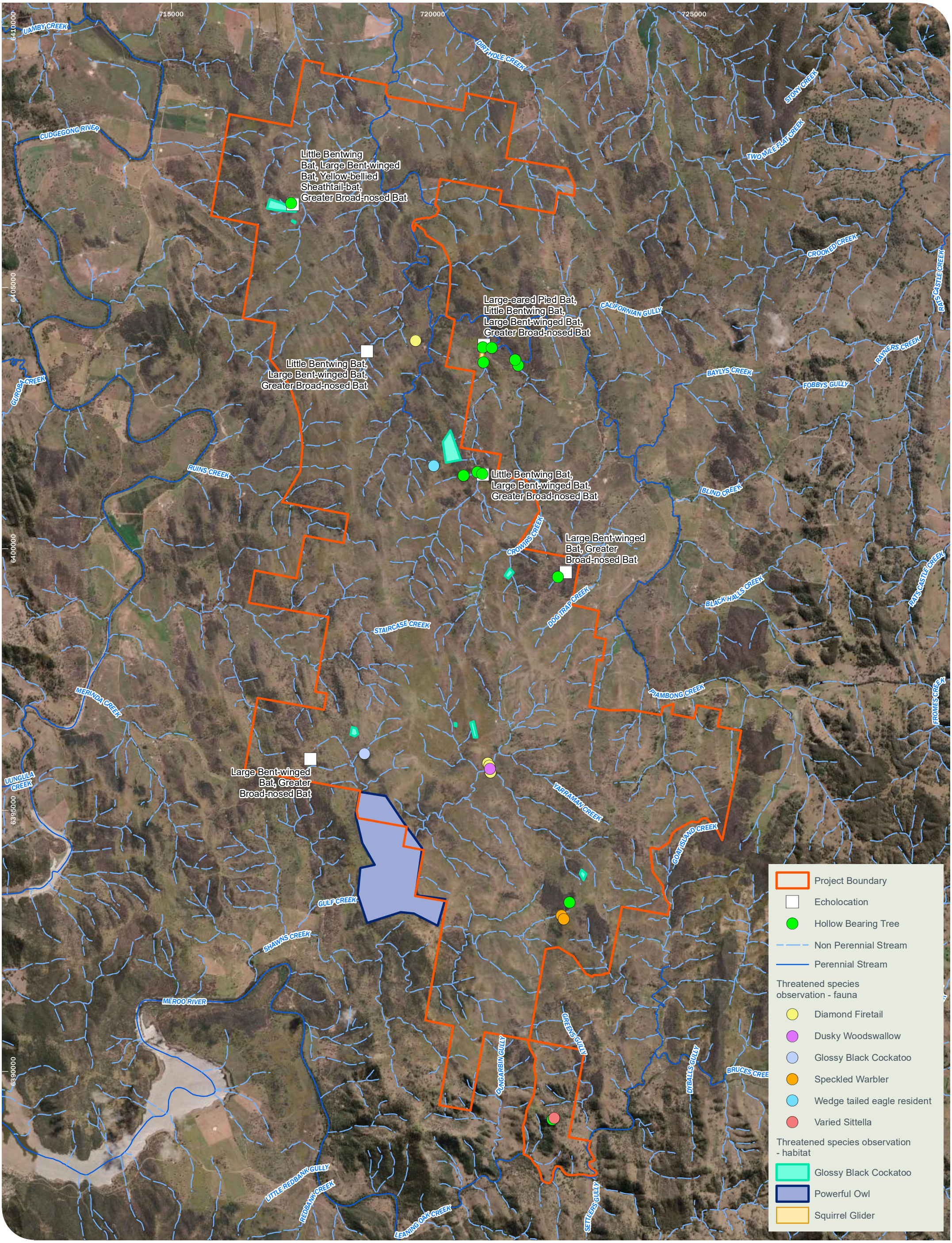
Niche Proj. #: 6889
Client: AECOM Australia Pty Ltd

Vegetation Mapping

Piambong Wind Farm Preliminary Biodiversity Assessment

Figure 4

World Imagery: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



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Niche Proj. #: 6889
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Threatened species observations and habitat

Piambong Wind Farm Preliminary Biodiversity Assessment

Figure 5

World Imagery: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

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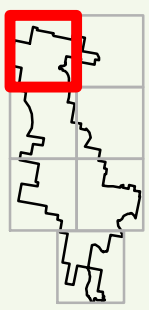

Project Boundary

Existing tracks not requiring clearing

Clearing zones

Easement Clearing Zone

Hazard Tree Zone

Full Clearing Zone

Niche Vegetation Mapping

PCT, Condition class

0: Not Native

1330: Yellow Box - Blakelys Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion, Moderate

266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion, Derived Native Grassland

266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion, Low

266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion, Moderate

272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes, Derived Native Grassland

272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes, Low

272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes, Moderate

277: Blakelys Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion, Derived Native Grassland

277: Blakelys Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion, Low

277: Blakelys Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion, Moderate

281: Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion, Derived Native Grassland

281: Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion, Low

281: Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion, Moderate

461: Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion, Derived Native Grassland

461: Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion, Low

461: Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion, Moderate

511: Queensland Bluegrass - Redleg Grass - Rats Tail Grass - spear grass - panic grass derived grassland of the Nandewar Bioregion and Brigalow Belt South Bioregion, Derived Native Grassland

511: Queensland Bluegrass - Redleg Grass - Rats Tail Grass - spear grass - panic grass derived grassland of the Nandewar Bioregion and Brigalow Belt South Bioregion, Moderate

81: Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion, Moderate

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GDA 1994 MGA Zone 55

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Client: AECOM Australia Pty Ltd

Preliminary development footprint

Piambong Wind Farm Preliminary Biodiversity Assessment

Figure 6.1

World Imagery: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

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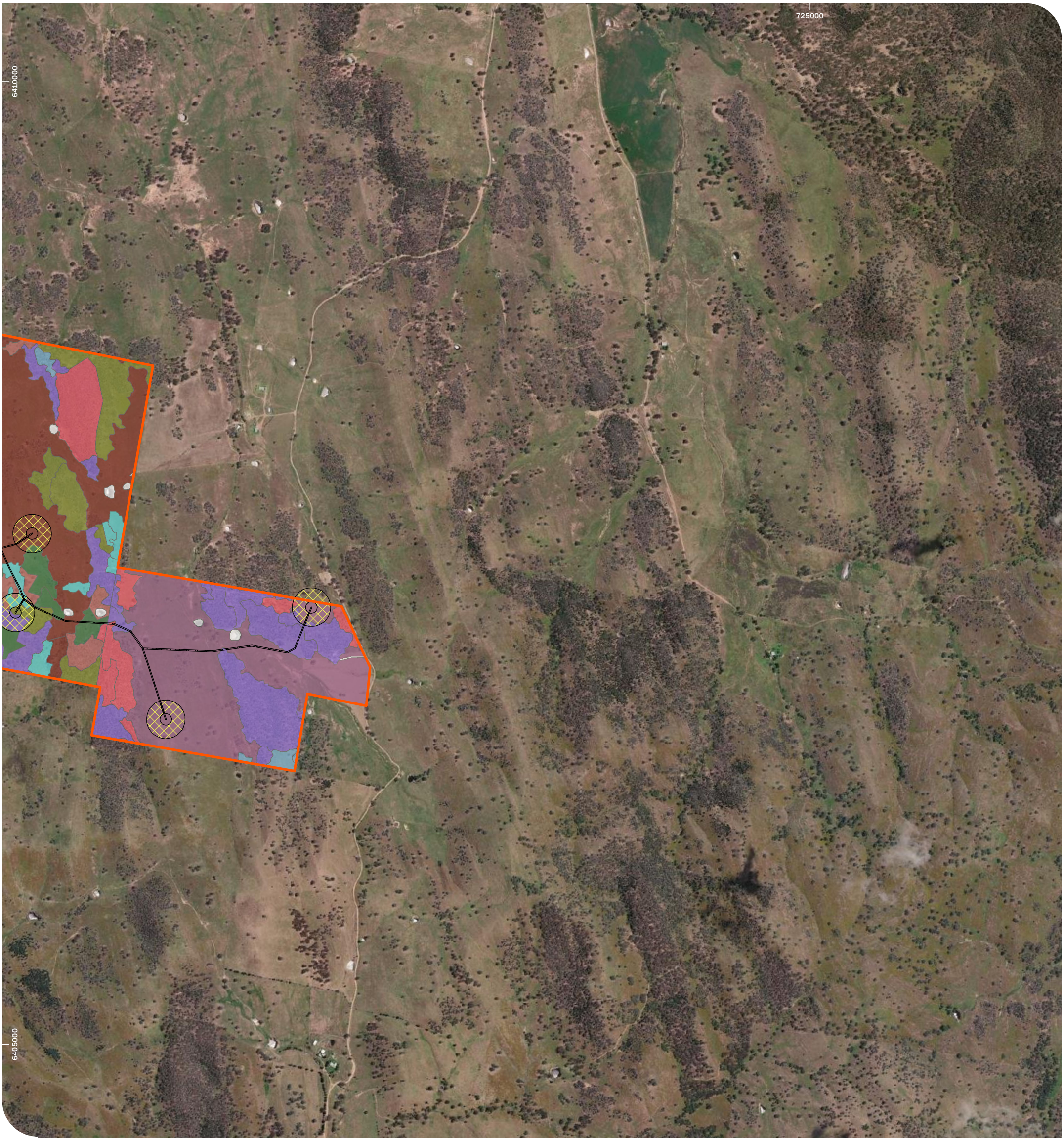

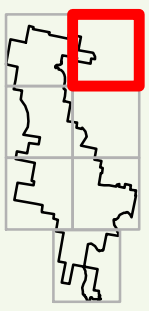

Project Boundary

Existing tracks not requiring clearing

Clearing zones

Easement Clearing Zone

Full Clearing Zone

Niche Vegetation Mapping

PCT, Condition class

0: Not Native

1330: Yellow Box - Blakelys Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion, Moderate

266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion, Derived Native Grassland

266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion, Low

266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion, Moderate

272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes, Moderate

277: Blakelys Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion, Derived Native Grassland

461: Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion, Derived Native Grassland

461: Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion, Low

461: Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion, Moderate

Environment and Heritage

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m

GDA 1994 MGA Zone 55

Niche PM: Chani Wheeler
Niche Proj. #: 6889
Client: AECOM Australia Pty Ltd

Preliminary development footprint

Piambong Wind Farm Preliminary Biodiversity Assessment

Figure 6.2

World Imagery: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

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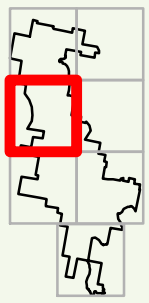

Project Boundary

Existing tracks not requiring clearing

Clearing zones

Easement Clearing Zone

Hazard Tree Zone

Full Clearing Zone

Niche Vegetation Mapping

PCT, Condition class

0: Not Native

1330: Yellow Box - Blakelys Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion, Moderate

186: Dwyers Red Gum - Black Cypress Pine - Currawang shrubby low woodland on rocky hills mainly in the NSW South Western Slopes Bioregion, Derived Native Grassland

186: Dwyers Red Gum - Black Cypress Pine - Currawang shrubby low woodland on rocky hills mainly in the NSW South Western Slopes Bioregion, Moderate

266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion, Low

277: Blakelys Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion, Derived Native Grassland

277: Blakelys Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion, Moderate

281: Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion, Derived Native Grassland

281: Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion, Low

281: Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion, Moderate

461: Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion, Derived Native Grassland

461: Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion, Low

461: Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion, Moderate

niche Environment and Heritage

0 400 m

GDA 1994 MGA Zone 55

Niche PM: Chani Wheeler
Niche Proj. #: 6889
Client: AECOM Australia Pty Ltd

Preliminary development footprint

Piambong Wind Farm Preliminary Biodiversity Assessment

Figure 6.3

World Imagery: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

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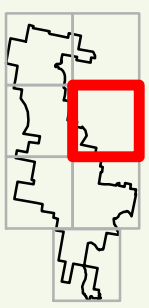

Project Boundary

Existing tracks not requiring clearing

Clearing zones

Easement Clearing Zone

Full Clearing Zone

Niche Vegetation Mapping

PCT, Condition class

0: Not Native

277: Blakelys Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion, Derived Native Grassland

281: Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion, Low

281: Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion, Moderate

461: Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion, Derived Native Grassland

461: Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion, Low

461: Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion, Moderate

niche Environment and Heritage

0 400

m

GDA 1994 MGA Zone 55

Niche PM: Chani Wheeler
Niche Proj. #: 6889
Client: AECOM Australia Pty Ltd

Preliminary development footprint

Piambong Wind Farm Preliminary Biodiversity Assessment

Figure 6.4

World Imagery: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

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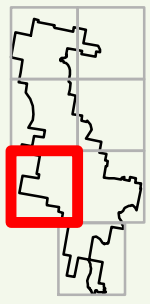

Project Boundary

Existing tracks not requiring clearing

Clearing zones

Easement Clearing Zone

Hazard Tree Zone

Full Clearing Zone

Niche Vegetation Mapping

PCT, Condition class

0: Not Native

186: Dwyers Red Gum - Black Cypress Pine - Currawang shrubby low woodland on rocky hills mainly in the NSW South Western Slopes Bioregion, Moderate

266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion, Low

266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion, Moderate

277: Blakelys Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion, Derived Native Grassland

277: Blakelys Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion, Moderate

281: Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion, Low

281: Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion, Moderate

287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion, Moderate

332: Tumbledown Red Gum - Black Cypress Pine - Red Stringybark woodland on rocky hills in the NSW central western slopes, Moderate

347: White Box - Blakelys Red Gum shrub/grass woodland on metamorphic hillslopes in the mid-southern part of the upper slopes sub-region of the NSW South Western Slopes Bioregion, Moderate

461: Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion, Derived Native Grassland

461: Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion, Low

461: Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion, Moderate

477: Inland Scribbly Gum - Red Stringybark - Black Cypress Pine - Red Ironbark open forest on sandstone hills in the southern Brigalow Belt South Bioregion and northern NSW South Western Slopes Bioregion, Moderate

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0 400 m

GDA 1994 MGA Zone 55

Niche PM: Chani Wheeler
Niche Proj. #: 6889
Client: AECOM Australia Pty Ltd

Preliminary development footprint

Piambong Wind Farm Preliminary Biodiversity Assessment

Figure 6.5

World Imagery: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

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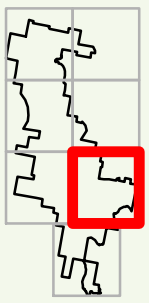

Project Boundary

Existing tracks not requiring clearing

Clearing zones

Easement Clearing Zone

Hazard Tree Zone

Full Clearing Zone

Niche Vegetation Mapping

PCT, Condition class

0: Not Native

1330: Yellow Box - Blakelys Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion, Moderate

266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion, Derived Native Grassland

266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion, Low

266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion, Moderate

267: White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion, Derived Native Grassland

267: White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion, Moderate

272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes, Derived Native Grassland

272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes, Low

272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes, Moderate

277: Blakelys Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion, Derived Native Grassland

277: Blakelys Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion, Low

277: Blakelys Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion, Moderate

281: Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion, Low

281: Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion, Moderate

283: Apple Box - Blakelys Red Gum moist valley and footslopes grass-forb open forest of the NSW South Western Slopes Bioregion, Moderate

287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion, Moderate

331: Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion, Moderate

347: White Box - Blakelys Red Gum shrub/grass woodland on metamorphic hillslopes in the mid-southern part of the upper slopes sub-region of the NSW South Western Slopes Bioregion, Low

347: White Box - Blakelys Red Gum shrub/grass woodland on metamorphic hillslopes in the mid-southern part of the upper slopes sub-region of the NSW South Western Slopes Bioregion, Moderate

461: Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion, Derived Native Grassland

461: Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion, Low

461: Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion, Moderate

477: Inland Scribbly Gum - Red Stringybark - Black Cypress Pine - Red Ironbark open forest on sandstone hills in the southern Brigalow Belt South Bioregion and northern NSW South Western Slopes Bioregion, Moderate

478: Red Ironbark - Black Cypress Pine - stringybark +/- Narrow-leaved Wattle shrubby open forest on sandstone in the Gulgong - Mendooran region, southern Brigalow Belt South Bioregion, Moderate

niche Environment and Heritage

0 400 m

GDA 1994 MGA Zone 55

Niche PM: Chani Wheeler
Niche Proj. #: 6889
Client: AECOM Australia Pty Ltd

Preliminary development footprint

Piambong Wind Farm Preliminary Biodiversity Assessment

Figure 6.6

World Imagery: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

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Project Boundary

Existing tracks not requiring clearing

Clearing zones

Easement Clearing Zone

Full Clearing Zone

Niche Vegetation Mapping

PCT, Condition class

0: Not Native

1330: Yellow Box - Blakelys Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion, Moderate

186: Dwyers Red Gum - Black Cypress Pine - Currawang shrubby low woodland on rocky hills mainly in the NSW South Western Slopes Bioregion, Moderate

277: Blakelys Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion, Moderate

278: Riparian Blakelys Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion, Moderate

279: Blakelys Red Gum - White Cypress Pine woodland on footslopes of hills in central part of the NSW South Western Slopes Bioregion, Moderate

281: Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion, Moderate

287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion, Moderate

347: White Box - Blakelys Red Gum shrub/grass woodland on metamorphic hillslopes in the mid-southern part of the upper slopes sub-region of the NSW South Western Slopes Bioregion, Moderate

461: Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion, Derived Native Grassland

461: Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion, Moderate

84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion, Moderate

niche Environment and Heritage

0 400 m

GDA 1994 MGA Zone 55

Niche PM: Chani Wheeler
Niche Proj. #: 6889
Client: AECOM Australia Pty Ltd

Preliminary development footprint

Piambong Wind Farm Preliminary Biodiversity Assessment

Figure 6.7

World Imagery: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

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Scientific name	Common name	BC Status	EPBC Status	FM Status	Survey Months	Habitat requirements/constraints	SAII	Likelihood of occurrence	Justification
Flora									
Acacia ausfeldii	Ausfeld's Wattle	V	-		August - October	Occurs within the Mudgee-Ulan-Gulgong area, as well as some records in the adjoining Brigalow Belt South, South Eastern Highlands and the Sydney Basin bioregions. Associated species include White Box, Blakely's Red Gum and *Callitris* spp, with understorey of *Cassinia* spp. and grasses. Habitat constraints are listed as foot slopes and low rises on sandstone. The species is known to flower from August to October and germination is known to be stimulated by fire.	No	High	4 individuals recorded within 10km in 2016 (DPE 2023a), and a large amount of potential habitat is mapped in the Site (in PCTs 266, 277, 281, 461).
Acacia meiantha	*Acacia meiantha*	E	E		July - October	It is found in three disjunct populations, all within the Central Tablelands and within 100km of each other. These populations include Clarence, which covers an area of approximately 1 hectare; Mullions Range, covering approximately 5 hectares; and Aarons Pass, which is confined to 2.5km of road easements.	Yes	Low	No records within 10km and no habitat (associated PCTs) mapped within the Site.
Acacia phasmoides	Phantom Wattle	V	V		September	*Acacia phasmoides* grows in shrubby woodland on sandy, granitic soil near creeks or in rocky crevices.	Yes	Low	No records within 10km, however there is a small amount of potential habitat (PCT 278) mapped in the Site.
Ammobium craspedioides	Yass Daisy	V	V		September - November	Occurs between Crookwell and Wagga Wagga, with most populations near Yass. Occurs in moist or dry forest communities, Box-Gum Woodland and secondary grasslands derived from clearing of these communities. Grows in association with a range of eucalypts (Blakely's Red Gum, Apple Box, Broad-leaved Peppermint, Long-leaved Box, Red Stringybark, Brittle Gum, Yellow Box, Red Box, Candlebark).	No	Moderate	No records within 10km, however there is a large amount of potential habitat within the associated PCTs 266, 277, 287, 1330.
Amphibromus fluitans	Floating Swamp Wallaby-grass	V	V		January - December	*Amphibromus fluitans* grows mostly in permanent swamps. The species needs wetlands which are at least moderately fertile, and which have some bare ground, conditions which are produced by seasonally-fluctuating water levels. Habitats in south-western NSW include swamp margins in mud, dam and tank beds in hard clay	No	Low	No records within 10km and no habitat (associated PCTs) mapped within the Site.

Scientific name	Common name	BC Status	EPBC Status	FM Status	Survey Months	Habitat requirements/constraints	SAII	Likelihood of occurrence	Justification
						and in semi-dry mud of lagoons with Potamogeton and Chamaeraphis species.			
Austrostipa wakoolica	-	E	E		October - December	Confined to floodplains of the Murray River tributaries of central and south western NSW, in open woodland on grey, silty clay or sandy loam soils. Habitats include the edges of a lignum swamp with box and mallee; creek banks in grey, silty clay; mallee and lignum sandy-loam flat; open Cypress Pine forest on low sandy range; and a low, rocky rise. Associated species include White Cypress Pine, Grey Box, Bimble Box, *Austrostipa eremophila*, A. *drummondii*, *Austrodanthonia eriantha* and Climbing Saltbush. Flowers from October to December.	No	Low	No records within 10km and no habitat (associated PCTs) mapped within the Site.
Bertya opponens	Coolabah Bertya	V	V		January - December	Known from three scattered sites in NSW: near Coolabah in western NSW, and two locations south of Narrabri. A fourth population near Cobar is considered possibly extinct. Occurs in a range of habitats including stony mallee ridges and cypress pine forest on red soils. Associated species at Jacks Creek SF (largest population) include Dirty Gum, White Cy+I49:I88press Pine and Red Ironbark. Flowering time is July and August.	Yes	Low	No records within 10km and no habitat (associated PCTs) mapped within the Site.
Bossiaea fragrans	-	CE	CE		January - December	Currently only known from the Abercrombie Karst Conservation Reserve, south of Bathurst on the NSW central tablelands. It is highly restricted, with only a small number of known populations. Occurs on spilite, rhyolite or slate and volcanic substrates and is often associated with Red Stringybark (*Eucalyptus macrorhyncha*) - Red Box *(Eucalyptus polyanthemos*) woodland +/- White Box (*Eucalyptus albens*).	Yes	Low	No records within 10km and no habitat (associated PCTs) mapped within the Site.
Caesia parviflora var. *minor*	Small Pale Grass-lily	E	-		January - December	In NSW occurs in Barcoongere State Forest between Grafton and Coffs Harbour. May be more widely distributed as not often identified to subspecies level. Grows in damp open places in open forest on sandstone.	No	Low	No records within 10km and no habitat (associated PCTs) mapped within the Site.
Caladenia arenaria	Sand-hill Spider Orchid	E	E		September	Caladenia arenaria occurs in woodland with sandy soil, especially that dominated by White Cypress Pine.	Yes	Low	No records within 10km and no habitat (associated PCTs) mapped within the Site.

Scientific name	Common name	BC Status	EPBC Status	FM Status	Survey Months	Habitat requirements/constraints	SAII	Likelihood of occurrence	Justification
Caladenia attenuata	Duramana Fingers	CE	CE		October - November	*Caladenia attenuata* is endemic to NSW. It has a highly restricted distribution, having been recorded from 2 localities within the Bathurst Ilford region with an area of occupancy estimated to be 8 km^2. Recent surveys have only found an unconfirmed specimen from the Ilford site.	Yes	Low	No records within 10km and no habitat (associated PCTs) mapped within the Site.
Caladenia concolor	Crimson Spider Orchid	E	V		September	Occurs in two main population near Bethungra and Burrinjuck Nature reserve. The other occurrences in NSW occur near Albury. Grows in regrowth woodland on granite ridge country that has retained a high diversity of plant species, including other orchids. Dominant associated trees are Blakely's Red Gum, Red Stringybark, Red Box and White Box; understorey includes Silver Wattle, Hop Bitter-pea, *Leucopogon virgatus*, Blueberry Lily and Tussock.	Yes	Low	No records within 10km and no habitat (associated PCTs) mapped within the Site.
Caladenia rosella	Rosella Spider Orchid	X	E		-	In Victoria, Caladenia rosella is found in woodlands and low forests of Red Box (*Eucalyptus polyanthemos*), Long-leafed Box (E. *goniocalyx*) and Red Stringybark (E. *macrorhyncha*) in well-drained, skeletal soils.	-	Low	No records within 10km and no habitat (associated PCTs) mapped within the Site.
Commersonia procumbens	-	V	V		January - December	*Commersonia procumbens* is known to grow in sandy sites, often along roadsides. Recorded in Eucalyptus dealbata and *Eucalyptus sideroxylon* communities, *Melaleuca uncinata* scrub, under mallee eucalypts with a *Calytrix tetragona* understorey, and in a recently burnt Ironbark and Callitris area. Also in *Eucalyptus fibrosa* subsp. *nubila, Eucalyptus dealbata, Eucalyptus albens* and *Callitris glaucophylla* woodlands north of Dubbo. Other associated species include *Acacia triptera, Callitris endlicheri, Eucalyptus melliodora, Allocasuarina diminuta, Philotheca salsolifolia, Xanthorrhoea species, Exocarpos cupressiformis, Leptospermum parvifolium* and *Kunzea parvifolia*.	No	Low	No records within 10km and no habitat (associated PCTs) mapped within the Site.
Cullen parvum	Small Scurf-pea	E	-		January - December	In known populations in Victoria and NSW, Cullen parvum is found in grassland, River Red Gum (*Eucalyptus camaldulensis*) Woodland or Box-Gum Woodland, sometimes on grazed land and usually on table drains or	No	Moderate	No records within 10km, however there is a moderate amount of potential habitat (associated PCTs 277) mapped within the Site.

Scientific name	Common name	BC Status	EPBC Status	FM Status	Survey Months	Habitat requirements/constraints	SAII	Likelihood of occurrence	Justification
						adjacent to drainage lines or watercourses, in areas with rainfall of between 450 and 700 mm.			
Cynanchum elegans	White-flowered Wax Plant	E	E		January - December	Occurs from Gerroa (Illawarra) to Brunswick Heads and west to Merriwa in the upper Hunter. Most common near Kempsey. Usually occurs on the edge of dry rainforest or littoral rainforest, but also occurs in Coastal Banksia Scrub, open forest and woodland, and Melaleuca scrub. Soil and geology types are not limiting. Flowering occurs between August and May, with the peak in November.	No	Low	No records within 10km, however there is a small amount of potential habitat (PCT 278) mapped in the Site.
Dichanthium setosum	Bluegrass	V	V		January - December	Occurs on the New England Tablelands, North-west Slopes and Plains and the Central-west Slopes. Associated with heavy basaltic black soils and red-brown loams with clay subsoil. Often found in moderately disturbed areas such as cleared woodland, grassy roadside remnants and highly disturbed pasture. Appears to have wide environmental tolerances.	No	Moderate	No records within 10km, however there is a large amount of potential habitat is mapped in the Site (in PCT 281, 461).
Digitaria porrecta	Finger Panic Grass	E	-		January - February	In NSW found on the North West Slopes and Plains, from near Moree south to Tambar Springs and from Tamworth to Coonabarabran. Inhabits native grasslands, woodland and open forests with grassy understorey on richer soils. Often found along roadsides and travelling stock routes where there is light grazing and occasional fire.	No	Low	No records within 10km and no habitat (associated PCTs) mapped within the Site.
Diuris tricolor	Pine Donkey Orchid	V	-		September - October	Sporadic distribution on the western slopes of NSW, from south of Narrandera to the Queensland border. The Pine Donkey Orchid grows in sclerophyll forest among grass, often with native Cypress Pine (Callitris spp.). It is found in sandy soils, either on flats or small rises. Also recorded from a red earth soil in a Bimble Box community in western NSW. Associated species include White Cypress Pine, Bimble Box, Gum Coolibah, Ironbark and Acacia shrubland.	No	Moderate	No records within 10km, however there is a large amount of potential habitat (associated PCTs 461) mapped within the Site.
Eriocaulon australasicum	Austral Pipewort	E	E		January - December	Known in NSW from widely separated populations: a very early "Murray River" collection and recent collections near Braidwood and in the Pilliga. Known from very few collections, with the type habitat described as "wet places	Yes	Low	No records within 10km and no habitat (associated PCTs) mapped within the Site.

Scientific name	Common name	BC Status	EPBC Status	FM Status	Survey Months	Habitat requirements/constraints	SAII	Likelihood of occurrence	Justification
						along the Murray towards junction of Murrumbidgee". It grows in mud in ephemeral water bodies. Adequate survey of the species is highly dependent on rainfall and should be surveyed when ephemeral wet areas are receding.			
Eucalyptus aggregata	Black Gum	V	V		January - December	Occurs on the central and southern tablelands of NSW, and in a small disjunct population in Victoria. In NSW it occurs in the South Eastern Highlands Bioregion and on the western fringe of the Sydney Basin Bioregion. Black Gum grows in the lowest parts of the landscape, on grassy woodlands on alluvial soils in moist sites along creeks on broad, cold and poorly-drained flats and hollows. Commonly occurs with Candlebark, Ribbon Gum, and White Sally with a grassy understorey of Tussock. Also occurs as isolated paddock trees in modified native, exotic pastures or travelling stock reserves.	No	Low	No records within 10km however there is a moderated amount of potential habitat (associated PCT 186) mapped within the Site.
Eucalyptus alligatrix subsp. *alligatrix*	-	V	V		January - December	Only known from a single location south-west of Rylstone; however, the species has reportedly been widely propagated and planted in the Rylstone area. Grows in dry sclerophyll woodland on shallow relatively infertile soils (grey brown loam with ironstone).	Yes	Low	No records within 10km however there is a small amount of potential habitat (associated PCT 278) mapped within the Site.
Eucalyptus cannonii	Capertee Stringybark	V	-		January - December	Mostly restricted to the central tablelands and slopes from Bathurst and Wallerawang to Mudgee, with isolated occurrences between Dunedoo and Merriwa. Broad altitudinal range (approximately 450 - 1050m asl), and appears to tolerate most situations except valley floors. Occurs in dry sclerophyll forests and woodlands with grassy/shrubby understoreys, associated with a diverse suite of eucalypts. Flowers between January to April.	No	Low	No records within 10km and no habitat (associated PCTs) mapped within the Site.
Eucalyptus pulverulenta	Silver-leafed Gum	V	V		January - December	The Silver-leafed Gum is a distinctively wattle-like, straggly mallee or small tree to about 10 m tall. This species grows in shallow soils as an understorey plant in open forest, typically dominated by Brittle Gum, Red Stringybark, Broad-leafed Peppermint, Silvertop Ash and Apple Box. The Silver-leafed Gum is found in two quite	No	Low	No records within 10km and no habitat (associated PCTs) mapped within the Site.

Scientific name	Common name	BC Status	EPBC Status	FM Status	Survey Months	Habitat requirements/constraints	SAII	Likelihood of occurrence	Justification
						separate areas, the Lithgow to Bathurst area and the Monaro (Bredbo, Bombala areas).			
Eucalyptus robertsonii subsp. *hemisphaerica*	Robertson's Peppermint	V	V		January - December	Known only from the central tablelands of NSW, at small disjunct localities from north of Orange to Burraga. Locally frequent in grassy or dry sclerophyll woodland or forest, on lighter soils and often on granite. Usually found in closed grassy woodlands in locally sheltered sites. Habitats include quartzite ridges, upper slopes and a slight rise of shallow clay over volcanics. Flowers from February to March.	Yes	Low	No records within 10km and no habitat (associated PCTs) mapped within the Site.
Euphrasia arguta	-	CE	CE		January - December	Recently rediscovered near Nundle on the north-western slopes and tablelands, once known from scattered locations between Sydney, Bathurst and Walcha. Known populations occur in eucalypt forest with a mixed grass/shrub understorey, while previous records are described as occurring in open forest, grassy country and river meadows. Dense stands observed in cleared firebreak areas, suggesting it may respond well to disturbance.	Yes	Moderate	No records within 10km, however there is a large amount of potential habitat (associated PCTs 266, 277, 281, 287) mapped within the Site.
Euphrasia collina subsp. muelleri	Mueller's Eyebright	E	E		January - December	Little is known about the preferred habitat of *Euphrasia collina* subsp. *muelleri* , although there is a reference to "damp places" in an early von Mueller collection. Extant populations in Victoria occur in heathy woodland.	Yes	Low	No records within 10km and no habitat (associated PCTs) mapped within the Site.
Grevillea divaricata	-	E	-		April	Specimen notes describe *Grevillea divaricata* as occurring frequently in dry open forest lands and as possibly growing on rocky river margins.	Yes	Low	No records within 10km and no habitat (associated PCTs) mapped within the Site.
Grevillea wilkinsonii	Tumut Grevillea	CE	E		October	At the Goobarragandra River sites *Grevillea wilkinsonii* generally grows in close proximity to the water, at altitudes between 310 and 340 m. Most healthy adult plants occur in open sunny areas, and those plants found under the canopy of dense vegetation tend to be spindly and are sometimes subject to sooty mould infestations. The associated native vegetation in the Goobarragandra sites are typically remnant riverine shrub communities adjacent to open-forest, with the most common tree	Yes	Low	No records within 10km, however, a small amount of potential habitat (associated PCTs 266, 278) is mapped in the Site.

Scientific name	Common name	BC Status	EPBC Status	FM Status	Survey Months	Habitat requirements/constraints	SAII	Likelihood of occurrence	Justification
						species being Blakely's Red Gum (*Eucalyptus blakelyi*), Apple Box (E. *bridgesiana*), Yellow Box (E. *melliodora*), and Red Stringybark (E. *macrorhyncha*) and with Kurrajongs (*Brachychiton populneus*) sometimes growing in nearby paddocks. The population at Gundagai is growing on the upper slope of a steep hill on Serpentinite rock. The associated native vegetation at this site is a grassy White Box (*Eucalyptus albens*) woodland with scattered shrubs of Pink Wedding Bush (*Ricinocarpos bowmanii*) and Hop Bush (*Dodonaea viscosa*). The groundcover is dominated by Kangaroo Grass (*Themeda triandra*) and Snow Grass (*Poa sieberiana*).			
Homoranthus darwinioides	Fairy Bells	V	V		March - December	Rare in the central tablelands and western slopes, occurring from Putty to the Dubbo area. Grows in various woodland habitats with shrubby understoreys, usually in gravelly sandy soils. Landforms the species has been recorded growing on include flat sunny ridge tops with scrubby woodland, sloping ridges, gentle south-facing slopes, and a slight depression on a roadside with loamy sand.	No	Low	No records within 10km and no habitat (associated PCTs) mapped within the Site.
Indigofera efoliata	Leafless Indigo	E	E		August - October	Very rare and possibly extinct, known only from a few records near Dubbo. Recorded in Goonoo State Forest in *Eucalyptus crebra* and *Callitris glaucophylla* dry sclerophyll forest, and in *Eucalyptus microcarpa* and *Callitris glaucophylla* tall woodland. Herbarium records note the species as growing on slight rises amongst ironstone formation in stony red-brown sandy loam.	Yes	Low	No records within 10km and no habitat (associated PCTs) mapped within the Site.
Lepidium aschersonii	Spiny Peppercress	V	V		January - December	The species is not widespread, occurring in the marginal central-western slopes and north-western plains regions of NSW. Found on ridges of gilgai clays dominated by *Acacia harpophyll, Casuarina cristata, Allocasuarina luehmanii* and *Eucalyptus microcarpa*. The species grows as a component of the ground flora, in grey loamy clays. Vegetation structure varies from open to dense, with	No	Low	No records within 10km and no habitat (associated PCTs) mapped within the Site.

Scientific name	Common name	BC Status	EPBC Status	FM Status	Survey Months	Habitat requirements/constraints	SAII	Likelihood of occurrence	Justification
						sparse grassy understorey with introduced plants and occasional heavy litter.			
Leucochrysum albicans var. *tricolor*	Hoary Sunray	E	E		January - December	*Leucochrysum albicans* var. *tricolor* occurs in a wide variety of grassland, woodland and forest habitats, generally on relatively heavy soils. The species can occur in modified habitats such as semi-urban areas and roadsides, and is highly dependent on the presence of bare ground for germination.	No	Moderate	No records within 10km,however a large amount of potential habitat (associated PCTs 186 and 1330) are mapped in the Site.
Monotaxis macrophylla	Large-leafed Monotaxis	E	-		January - December	Recorded from highly disjunct populations in NSW: Deua National Park (NP), the Cobar area, the Tenterfield area, Woodenbong and Bemboka portion of South East Forests NP. Associated with a diverse range of communities in NSW, including coastal heath, arid shrubland, forests and montane heath. The occurrence of the species is associated with fire.	No	Moderate	No records within 10km, however there is a large amount of potential habitat mapped in the Site (associated PCTs 186, 277, 278).
Myriophyllum implicatum	-	CE	-		January - December	This species was previously thought to be extinct in NSW; however the plant was recently discovered in the Pilliga National Park, south of Narrabri. Recent population found in a large open partly inundated gilgai depression on cracking clay soil. Occurs in moist situations, extending away from fresh water.	Yes	Low	No records within 10km and no habitat (associated PCTs) mapped within the Site.
Myriophyllum implicatum	-	CE	-		January - December	This species was previously thought to be extinct in NSW; however the plant was recently discovered in the Pilliga National Park, south of Narrabri. Recent population found in a large open partly inundated gilgai depression on cracking clay soil. Occurs in moist situations, extending away from fresh water.	Yes	Low	No records within 10km and no habitat (associated PCTs) mapped within the Site.
Persoonia marginata	Clandulla Geebung	V	V		January - March	The Clandulla Geebung occurs between Kandos and Clarence in the western Blue Mountains. It grows in dry sclerophyll forest and woodland communities on sandstone.	No	Moderate	No records within 10km, however there is a large amount of potential habitat is mapped in the Site (associated PCTs 287).
Pilularia novae-hollandiae	Austral Pillwort	E	-		October - December	Only known extant populations in NSW are at Lake Cowal and Oolambeyan NP, but the species is obscure and may be overlooked elsewhere. Grows in shallow swamps and waterways, often among grasses and sedges. Previous	Yes	Low	No records within 10km and no habitat (associated PCTs) mapped within the Site.

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						records in Albury-Urana were from table drains beside roads, whereas the only record in the ACT was from a subalpine grassy plain.			
Polygala linariifolia	Native Milkwort	E	-		January - December	In NSW known from three locations: an isolated population west of Hungerford; north from Warialda and Copeton Dam; and on the north coast near Casino and Kyogle. Grows in sandy soils in dry eucalypt forest and woodalnd with a sparse understorey. In the Pilliga area has been recorded in Fuzzy Box woodland, White Cypress Pine - Bulloke - Ironbark woodland, Rough-barked Apple riparian forb-grass open forest, and Ironbark - Brown Bloodwood shrubby woodland.	No	Moderate	No records within 10km, however there is a large amount of potential habitat is mapped in the Site (associated PCT 277).
Pomaderris cotoneaster	Cotoneaster Pomaderris	E	E		October - November	Disjunct distribution including the Nungatta area, Tumut, the Tantawangalo area, near Tallong, the Yerranderie area, the Canyonleigh area and Ettrema Gorge. Found in wide range of habitats, including forest with deep, friable soil, amongst rock beside a creek, on rocky forested slopes and in steep gullies between sandstone cliffs.	No	Low	No records within 10km,however a small amount of potential habitat (associated PCT 266) is mapped in the Site.
Pomaderris queenslandica	Scant Pomaderris	E	-		January - December	Widespread but uncommon in northeast NSW and in Queensland. Known only from a few locations on the New England Tablelands and northwest slopes, including near Torrington and Coolatai, and from the NSW north coast. Inhabits moist eucalypt forest or sheltered woodlands with a shrubby understorey, and occasionally along creeks.	No	Moderate	No records within 10km, however there is a large amount of potential habitat is mapped in the Site (associated PCTs 277, 278).
Prasophyllum petilum	Tarengo Leek Orchid	E	E		September - December	Occurs at 4 sites in NSW (Captains Flat Cemetery, Ilford Cemetery, Steves TSR at Delegate and Tarengo TSR near Boorowa). Also, at Hall in ACT. Grows on relatively fertile soils in grassy woodland or natural grassland. Occurs in relatively moist, poorly drained areas.	No	Moderate	No records within 10km, however there is a large amount of potential habitat is mapped in the Site (associated PCTs 277, 278, 281, 1330).
Prasophyllum sp. Wybong	-	-	CE		September - October	Endemic to NSW, it is known from near Ilford, Premer, Muswellbrook, Wybong, Yeoval, Inverell, Tenterfield, Currabubula and the Pilliga area. Known to occur in open eucalypt woodland and grassland.	Yes	Moderate	No records within 10km, however there is a large amount of potential habitat is mapped in the Site (in PCT 266, 277, 281, 461).

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Pterostylis cobarensis	Greenhood Orchid	V	-		October	Recorded from Bourke, Nyngan, Cobar, Nymagee, Warren, Gilgandra, Narrabri and Coonabarabran districts. Grows in eucalypt woodlands, open mallee or Callitris shrublands on low stony ridges in skeletal sandy loam soils.	No	Low	No records within 10km and minimal amount of potential habitat (PCT 278) is mapped in the Site.
Pultenaea humilis	Dwarf Bush-pea	V	-		October - December	In NSW, *Pultenaea humilis* is currently known from three confirmed localities in the NSW South Western Slopes bioregion. *Pultenaea humilis* is found in isolated remnants of native woodland and forest communities that occur in extensively cleared agricultural landscapes. Occurs on a variety of soils ranging from sandy loams to clays	No	Moderate	No records within 10km, however there is a large amount of potential habitat is mapped in the Site (associated PCT 287).
Senecio garlandii	Woolly Ragwort	V	-		January - December	*Senecio garlandii* occurs on sheltered slopes of rocky outcrops.	No	Moderate	No records within 10km, however there is a large amount of potential habitat is mapped in the Site (associated PCTs 186, 287).
Swainsona murrayana	Slender Darling Pea	V	V		September	Found throughout NSW, it has been recorded in the Jerilderie and Deniliquin areas of the southern riverine plain, the Hay plain as far north as Willandra National Park, near Broken Hill and in various localities between Dubbo and Moree. Grows in a variety of soil and vegetation types. Plants have been found in remnant native grasslands or grassy woodlands that have been intermittently grazed or cultivated.	No	Low	No records within 10km and no habitat (associated PCTs) mapped within the Site.
Swainsona recta	Small Purple-pea	E	E		September - November	Current populations exist in the Queanbeyan and Wellington-Mudgee areas, previous populations thought extinct include Carcoar, Culcairn and Wagga Wagga. Also known from ACT and Victoria. Inhabits grassy woodlands and open-forests dominated by Blakely's Red Gum, Yellow Bloodwood, Candlebark and Long-leaved Box and in association with understorey dominants that include *Themeda australis, Poa* spp. and *Austrostipa* spp. Flowers throughout spring, with a peak in October.	No	High	12 records within 10km, last recorded 2020(DPE 2023a) additionally there is a large amount of potential habitat (associated PCTs 266, 277, 1330) mapped in the Site.
Swainsona sericea	Silky Swainson-pea	V	-		September - November	Occurs from the Northern Tablelands to the Southern Tablelands and further inland on the slopes and plains. One isolated record from far NW NSW. Its stronghold is	No	High	53 records within 10km (DPE 2023a) and a large amount of potential habitat is

Scientific name	Common name	BC Status	EPBC Status	FM Status	Survey Months	Habitat requirements/constraints	SAII	Likelihood of occurrence	Justification
						on the Monaro. Occurs in Natural Temperate Grassland and Snow Gum woodland on the Monaro, in Box-Gum Woodland in the Southern Tablelands and Southwest Slopes and is sometimes found in association with cypress pines.			mapped in the Site (in PCT 186, 266, 277, 281, 461, 1330).
Thesium australe	Austral Toadflax	V	V		January - December	Found in small, scattered populations along the east coast, northern and southern tablelands. Occurs in grassland or grassy woodland and is often found in association with Kangaroo Grass.	No	Moderate	No records within 10km, however there is a large amount of potential habitat is mapped in the Site (associated PCTs 186, 277, 1330).
Tylophora linearis	-	V	E		January - December	Majority of records occur in the central western region from Goonoo, Pillaga West, Pillaga East, Bibblewindi, Cumbil and Eura State Forests, Coolbaggie NR, Goobang NP and Beni SCA. Grows in dry scrub and open forest on low-altitude sedimentary flats.	No	Moderate	No records within 10km, however there is a large amount of potential habitat is mapped in the Site (in PCT 461).
Veronica blakelyi	-	V	-		January - December	Restricted to the western Blue Mountains, near Clarence, near Mt Horrible, on Nullo Mountain and in the Coricudgy Range. Occurs in eucalypt forest, often in moist and sheltered areas. Associated canopy species include *Eucalyptus dives*, E. *dalrympleana*, E. *rossii* and E. *pauciflora*. Flowering occurs in late spring to early summer.	No	Low	No records within 10km and no habitat (associated PCTs) mapped within the Site.
Zieria ingramii	Keith's Zieria	E	E		January - December	Known only from Goonoo SCA northeast of Dubbo. All known populations have been recorded in Eucalyptus-Callitris woodland or open forest with a shrubby to heathy understorey. Most records from gentle slopes in red-brown and yellow-brown sandy loams, often with a rocky surface.	No	Low	No records within 10km and no habitat (associated PCTs) mapped within the Site.
Zieria obcordata	Granite Zieria	E	E		September - October	Occurs at two sites near Wellington, in eucalypt woodland or shrubland dominated by species of Acacia on rocky hillsides. Also occurs in Eucalyptus and Callitris dominated woodland with an open, low shrub understorey, on moderately steep, mainly west to north-facing slopes in sandy loam amongst granite boulders.	Yes	Low	No records within 10km, however there is a moderate amount of potential habitat (associated PCT 287) mapped in the Site.
Amphibians									

Scientific name	Common name	BC Status	EPBC Status	FM Status	Survey Months	Habitat requirements/constraints	SAII	Likelihood of occurrence	Justification
Crinia sloanei	Sloane's Froglet	E	E		July - August	The majority of Sloane's Froglet records are in the Darling Riverine Plains, NSW South Western Slopes and Riverina bioregions in New South Wales. It has not been recorded recently in the northern part of its range and has only been recorded infrequently in the southern part of its range in NSW. The species is typically associated with periodically inundated areas in grassland, woodland and disturbed habitats.	No	Low	Suitable aquatic habitats are present in the Site. There are no previous records within 10km of the Site and the closest record was over 85km from the Project's boundary. Due to the lack of records within the surrounding region of the Site this species is considered unlikely to occur.
Litoria aurea	Green and Golden Bell Frog	E	V		January - December	Since 1990 there have been approximately 50 recorded locations of Green and Golden Bell Frog in NSW, most of which are small, coastal, or near coastal populations. These locations occur over the species' former range, however they are widely separated and isolated. Large populations in NSW are located around the metropolitan areas of Sydney, Shoalhaven and mid north coast (one an island population). There is only one known population on the NSW Southern Tablelands. The species inhabits marshes, dams and stream-sides, particularly those containing bullrushes (*Typha* spp.) or spikerushes (*Eleocharis* spp.). Optimal habitat includes water-bodies that are unshaded, free of predatory fish such as Plague Minnow (*Gambusia holbrooki*), have a grassy area nearby and diurnal sheltering sites available. Some sites the species has been recorded in, occur in highly disturbed areas.	No	Low	There is suitable aquatic habitat for this species in the Site. The Site is outside the species distribution range. This species is considered unlikely to occur.
Litoria booroolongensis	Booroolong Frog	E	E		October - December	"The Booroolong Frog is restricted to NSW and north-eastern Victoria, predominantly along the western-flowing streams of the Great Dividing Range. It has disappeared from much of the Northern Tablelands, however several populations have recently been recorded in the Namoi catchment. The species is rare throughout most of the remainder of its range. The species lives along permanent streams with some fringing vegetation cover such as ferns, sedges or grasses, and shelter under rocks or amongst vegetation near the ground on the stream edge. The adults have been	No	Low	This species is considered unlikely to occur due to the lack of suitable habitat and the Site being outside the species distribution.

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						recorded on or near cobble banks and other rock structures within stream margins.			
Litoria castanea	Yellow-spotted Tree Frog	CE	CE		November - December	There is a single known population of Yellow-spotted Tree Frog on the Southern Tablelands, near Yass. The species require large permanent ponds or slow flowing 'chain-of-ponds' streams with abundant emergent vegetation such as bulrushes and aquatic vegetation.	Yes	Low	Suitable habitat is present within the Site however the Site is outside the species distribution range. This species is considered unlikely to occur.
Litoria raniformis	Southern Bell Frog	E	V		January - December	Currently, the Growling Grass Frog is known to exist only in isolated populations in the Coleambally Irrigation Area, the Murrumbidgee floodplain and around Lake Victoria. A few yet unconfirmed records have also been made in the Murray Irrigation Area in recent years. The species is usually found in or around permanent or ephemeral Black Box/Lignum/Nitre Goosefoot swamps, Lignum/Typha swamps and River Red Gum swamps or billabongs along floodplains and river valleys. They are also found in irrigated rice crops, particularly where there is no available natural habitat. Breeding occurs during the warmer months and is triggered by flooding or a significant rise in water levels. The species has been known to breed anytime from early spring through to late summer/early autumn	No	Low	While there is suitable habitat in the Site including vegetated farm dams and associated creeks and drainage lines, the Site is well outside the species natural distribution range. This species is considered unlikely to occur.
Fish									
Maccullochella peelii	Murray Cod	-	V	-	-	The Murray Cod is found in a wide range of warm water habitats, from clear, rocky streams to slow-flowing turbid rivers and billabongs. Generally, they are found in waters up to 5 m deep and in sheltered areas with cover from rocks, timber or overhanging banks. The species is highly dependant on wood debris for habitat, using it to shelter from fast-flowing water.	No	Moderate	The Site is in proximity to known habitat but there are no records of this species within 10km. This species is a main-channel specialist, however may utilise the creeks in the Site when they are inundated as there is suitable rocky habitat and overhanging vegetation. This species is considered to have the potential to occur.
Mogurnda adspersa	Purple Spotted Gudgeon	-	-	E	-	Purple Spotted Gudgeon are a benthic species that can be found in a variety of habitat types such as rivers, creeks and	No	Moderate	Moderate at Yarraman Creek. Low at the other streams based on limited habitat features, connectivity and modification.

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						billabongs with slow-moving or still waters or in streams with low turbidity. Cover in the form of aquatic vegetation, overhanging vegetation from river banks, leaf litter, rocks or snags are important for the species. Most remnant populations in NSW occur in small to medium sized streams. They feed mainly on terrestrial insects and their larvae, worms, small fish, tadpoles, and some plant matter.			
Birds									
Actitis hypoleucos	Common Sandpiper	-	M, Ma		August - November	Utilises a wide range of coastal wetlands and some inland wetlands, mostly found around muddy margins or rocky shores. Forages in shallow water and on soft mud, roosts on rocks or vegetation such as mangroves. Northern hemisphere breeding.	No	Low	This species is considered unlikely to occur due to lack of suitable habitat.
Anthochaera phrygia	Regent Honeyeater	CE	CE		-	The Regent Honeyeater mainly inhabits temperate woodlands and open forests of the inland slopes of south-east Australia. Birds are also found in drier coastal woodlands and forests in some years. Once recorded between Adelaide and the central coast of Queensland, its range has contracted dramatically in the last 30 years to between north-eastern Victoria and south-eastern Queensland. There are only three known key breeding regions remaining: north-east Victoria (Chiltern-Albury), and in NSW at Capertee Valley and the Bundarra-Barraba region. In NSW the distribution is very patchy and mainly confined to the two main breeding areas and surrounding fragmented woodlands. In some years flocks converge on flowering coastal woodlands and forests. The species inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. Regent Honeyeaters inhabit woodlands that support a significantly high abundance and species richness of bird species. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes.	Yes	Moderate	Habitat in the Site is fragmented and is not considered core habitat for the species. There are no previous records within 10km of the Site though there are records in the surrounding region. The Site does have suitable foraging habitat and is within the species distribution range. However, the Site does not intersect a mapped important area for the species and is therefore considered unlikely to support breeding. As such, impacts to the species would be addressed through ecosystem credits and targeted surveys are not required.

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Aphelocephala leucopsis	Southern Whiteface	-	V		-	The Southern Whiteface inhabits a wide range of open woodlands and shrublands, usually dominated by acacias or eucalypts with a grassy or shrubby understorey for foraging on ranges, foothills and lowlands, and plains throughout inland arid and temperate Australia. Hollows and crevices in trees are used for roosting and nesting.	No	Moderate	Suitable open grassy woodland habitat is present within the Site. There are no records near the Site but it is within the species' distribution range. This species is considered to have the potential to occur.
Apus pacificus	Fork-tailed Swift	-	M, Ma		-	The Fork-tailed Swift is almost exclusively aerial, flying from less than one metre to at least 300 metres above ground and probably much higher.	No	Low	Migratory species which is almost exclusively aerial and occurs above a range of habitats in every state. Suitable open grassland habitat, however due to the transient presence of this species, lack of nearby records and generalist habitat requirements, this species is considered unlikely to occur.
Ardeotis australis	Australian Bustard	E	-		January - December	Occurs in inland Australia. In NSW mainly found in the north-west corner, less often in the lower western and central west plains regions, with occasional vagrants east to the western slopes and riverine plain. Breeding confined to the north-west region. Mainly inhabits tussock and hummock grasslands, also occurs in low shrublands and low open grassy woodlands. Breeds on bare ground on low sandy ridges or stony rises in ecotones between grassland and shrubland cover. Travels long distances, presumably in response to habitat and climatic conditions.	No	Low	Suitable habitat is present on site in the form of tussock grassland. There are no previous records within 10km of the Site and the closest record was located further than 100km from the Site boundary. The Site is outside the species current distribution. This species is considered unlikely to occur.
Botaurus poiciloptilus	Australasian Bittern	E	E		-	Australasian Bitterns are widespread but uncommon over south-eastern Australia. In NSW they may be found over most of the state except for the far north-west. Favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes (*Typha spp*.) and spikerushes (*Eleocharis spp*.).	No	Low	Aquatic habitat is present in the Site in the form of farm dams, ephemeral creeks and drainage lines. The site is within the known distribution of this species. However, this species prefers permanent wetland habitat which the site lacks.
Burhinus grallarius	Bush Stone-curlew	E	-		January - December	The Bush Stone-curlew is found throughout Australia except for the central southern coast and inland, the far south-east corner, and Tasmania. Only in northern Australia is it still common however and, in the south-	No	Low	Suitable grassy woodland habitat is present on site, however it is fragmented and current conditions were not sparse grassy underlayer as it has been a wet

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						east, it is either rare or extinct throughout its former range. It inhabits open forests and woodlands with a sparse grassy ground-layer and fallen timber, its diet consists of insects and small vertebrates, such as frogs, lizards and snakes. It is largely nocturnal, being especially active on moonlit nights and nests on the ground in a scrape or small bare patch.			season and grassy areas were dense. There are no records within 10km of the Site and beyond this there were only a few very old records. This species is considered unlikely to occur.
Calidris acuminata	Sharp-tailed Sandpiper	-	M, Ma		-	The Sharp-tailed Sandpiper is widespread in most regions of NSW, especially in coastal areas, but sparse in the south-central Western Plain and east Lower Western Regions. Prefers muddy edges of shallow or brackish wetlands, with inundated or emergent sedges, saltmarsh or other low vegetation. Also found foraging in sewage ponds and flooded paddocks. Non-breeding migrant to Australia.	No	Low	Migratory species with a widespread distribution in Australia. No records within range of the Site. Marginal flooded grassland habitat may be present during flood events, however it is considered unlikely to occur due to lack of records and suitable habitat.
Calidris ferruginea	Curlew Sandpiper	E	CE		-	The Curlew Sandpiper is distributed around most of the Australian coastline (including Tasmania). It occurs along the entire coast of NSW, particularly in the Hunter Estuary, and sometimes in freshwater wetlands in the Murray-Darling Basin. Inland records are probably mainly of birds pausing for a few days during migration. The Curlew Sandpiper breeds in Siberia and migrates to Australia (as well as Africa and Asia) for the non-breeding period, arriving in Australia between August and November, and departing between March and mid-April. It generally occupies littoral and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats of sheltered coasts. It also occurs in non-tidal swamps, lakes and lagoons on the coast and sometimes inland. It forages in or at the edge of shallow water, occasionally on exposed algal mats or waterweed, or on banks of beach-cast seagrass or seaweed.	Yes	Low	This species is considered unlikely to occur due to lack of suitable habitat.
Calidris melanotos	Pectoral Sandpiper	-	M, Ma		-	Prefers shallow fresh to saline wetlands, found at coastal lagoons, estuaries, bays, swamps, inundated grasslands,	No	Low	Migratory species with a widespread distribution in Australia. No records within range of the Site. Marginal flooded grassland habitat may be present during

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						saltmarshes and artificial wetlands. Northern hemisphere breeding.			flood events, however it is considered unlikely to occur due to lack of records and suitable habitat.
Callocephalon fimbriatum	Gang-gang Cockatoo	V	-		January - December	In New South Wales, the Gang-gang Cockatoo is distributed from the south-east coast to the Hunter region, and inland to the Central Tablelands and south-west slopes. It occurs regularly in the Australian Capital Territory. It is rare at the extremities of its range, with isolated records known from as far north as Coffs Harbour and as far west as Mudgee. In spring and summer, the species is generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In autumn and winter, the species often moves to lower altitudes in drier more open eucalypt forests and woodlands, particularly box-gum and box-ironbark assemblages, or in dry forest in coastal areas and often found in urban areas.	No	Low	The Site is on the outskirts of its current distribution there are no records within 10km of the Site. While there is suitable overwinter habitat in the Site in the form of box-ironbark woodland in dry country, due to the Site being outside its current distribution the species is considered unlikely to occur.
Calyptorhynchus lathami	Glossy Black-Cockatoo	V	-		April - August	The species is 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. It inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur. Black Sheoak (*Allocasuarina littoralis*) and Forest Sheoak (A. *torulosa*) are important foods. Inland populations feed on a wide range of sheoaks, including Drooping Sheoak, *Allocasuaraina diminuta*, and A. *gymnathera*. Belah is also utilised and may be a critical food source for some populations. The species is dependent on large hollow-bearing eucalypts for nest sites.	No	High	Allocasuarina woodlands are present in the Site and have been indicated in the shapefiles provided. The Site is within the species distribution range and there are previous records within 10km of the Site. Chewed Allocasuarina cones were observed on one occasion in the central west part of the Site which would indicate the birds visit the site. This species is considered likely to occur.
Gallinago hardwickii	Latham's Snipe	-	M, Ma		-	Latham's Snipe is a non-breeding migrant to the south east of Australia including Tasmania, passing through the north and New Guinea on passage. Latham's Snipe breed in Japan and on the east Asian mainland. seen in small	No	Low	No records within 10km and no habitat (associated PCTs) mapped within the Site.

Scientific name	Common name	BC Status	EPBC Status	FM Status	Survey Months	Habitat requirements/constraints	SAII	Likelihood of occurrence	Justification
						groups or singly in freshwater wetlands on or near the coast, generally among dense cover. They are found in any vegetation around wetlands, in sedges, grasses, lignum, reeds and rushes and also in saltmarsh and creek edges on migration.			
Haliaeetus leucogaster	White-bellied Sea-Eagle	V	-		July - December	The White-bellied Sea-eagle is widespread along the New South Wales coast, and along all major inland rivers and waterways. The species habitats are characterised by the presence of large areas of open water including larger rivers, swamps, lakes, and the sea. It occurs at sites near the sea or sea-shore, such as around bays and inlets, beaches, reefs, lagoons, estuaries and mangroves; and at, or in the vicinity of freshwater swamps, lakes, reservoirs, billabongs and saltmarsh. The terrestrial habitats the species has been recorded in, include coastal dunes, tidal flats, grassland, heathland, woodland, and forest (including rainforest).	No	Low	This species is considered unlikely to occur due to the lack of suitable habitat.
Hamirostra melanosternon	Black-breasted Buzzard	V	-		September - November	The Black-breasted Buzzard is found sparsely in areas of less than 500mm rainfall, from north-western NSW and north-eastern South Australia to the east coast at about Rockhampton, then across northern Australia south almost to Perth, avoiding only the Western Australian deserts. The species lives in a range of inland habitats, especially along timbered watercourses which is the preferred breeding habitat. Also hunts over grasslands and sparsely timbered woodlands.	No	Low	This species occurs in arid areas of NSW. The Site is outside its natural distribution. This species is considered unlikely to occur.
Hieraaetus morphnoides	Little Eagle	V	-		August - October	The Little Eagle is found throughout the Australian mainland excepting the most densely forested parts of the Dividing Range escarpment. It occurs as a single population throughout NSW. The species occupies open eucalypt forest, woodland or open woodland. Sheoak or Acacia woodlands and riparian woodlands of interior NSW are also used. It nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter.	No	High	Suitable habitat is present on site including open woodland habitat. The species was not recorded in the Site during the current field work though was recorded in the surrounding region. This species is considered likely to occur.

Scientific name	Common name	BC Status	EPBC Status	FM Status	Survey Months	Habitat requirements/constraints	SAII	Likelihood of occurrence	Justification
Hirundapus caudacutus	White-throated Needletail	-	V		-	Migratory and usually seen in eastern Australia from October to April. Breeds in forests in south-eastern Siberia, Mongolia, the Korean Peninsula and northern Japan June-August. Most often seen in eastern Australia before storms, low pressure troughs and approaching cold fronts and occasionally bushfire. These conditions are often used by insects to swarm (eg termites and ants) or tend to lift insects away from the surface which favours sighting of White-throated Needletails as they feed. More common in coastal areas, less so inland.	No	Moderate	There are no records within 10 km of the site, but the site is within the known distribution for this species and contains suitable habitat. This species is migratory and highly mobile, however there is potential for this species to occur within the site.
Lathamus discolor	Swift Parrot	E	CE, Ma		-	The Swift Parrot breeds in Tasmania during spring and summer, migrating in the autumn and winter months to south-eastern Australia from Victoria and the eastern parts of South Australia to south-east Queensland. In NSW mostly occurs on the coast and south west slopes. On the mainland the species occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Their favoured feed trees include winter flowering species such as Swamp Mahogany Eucalyptus robusta, Spotted Gum (*Corymbia maculate*), Red Bloodwood (C. *gummifera*), Forest Red Gum (E. *tereticornis*), Mugga Ironbark (E. *sideroxylon*), and White Box (E. *albens*).	Yes	Moderate	Suitable Box-Ironbark habitat in the Site. Habitats were fragmented. The Site is within its current distribution. This species may occur in the Site on occasions during the nonbreeding season from February to October and is considered as potentialy occurring.
Leipoa ocellata	Malleefowl	E	V, M		-	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.	No	Low	Ironbark habitat in the Site. This is considered to be low quality habitat for this species. The species tends to favour higher rainfall areas with mallee communities. There are no previous records within 10km of the Site. This species has three previous records within 20km of the Site, all records are at least 10 years old. This species is considered unlikely to occur due to the lack of suitable habitat and no recent records in the surrounding area.

Scientific name	Common name	BC Status	EPBC Status	FM Status	Survey Months	Habitat requirements/constraints	SAII	Likelihood of occurrence	Justification
Limosa limosa	Black-tailed Godwit	V	-		-	In NSW the Black-tailed Godwit most is frequently recorded at Kooragang Island (Hunter River estuary), with occasional records elsewhere along the coast, and inland. Records in western NSW indicate that a regular inland passage is used by the species, as it may occur around any of the large lakes in the western areas during summer, when the muddy shores are exposed. The species has been recorded within the Murray-Darling Basin, on the western slopes of the Northern Tablelands and in the far north-western corner of the state. The species is usually found in sheltered bays, estuaries and lagoons with large intertidal mudflats and/or sandflats. Further inland, it can also be found on mudflats and in water less than 10 cm deep, around muddy lakes and swamps.	No	Low	This species is considered unlikely to occur due to the lack of suitable habitat.
Lophochroa leadbeateri	Major Mitchell's Cockatoo	V	-		September - December	In NSW Major Mitchell's Cockatoo is found across the arid and semi-arid inland and is regularly as far east as about Bourke and Griffith, and sporadically further east than that. The species inhabits a wide range of treed and treeless inland habitats, always within easy reach of water. It feeds mostly on the ground, especially on the seeds of native and exotic melons and on the seeds of species of saltbush, wattles and cypress pines.	No	Low	This species occurs in dry arid areas of NSW. The Site is outside the species current distribution range and is considered unlikely to occur.
Lophoictinia isura	Square-tailed Kite	V	-		September - January	The Square-tailed Kite ranges along coastal and subcoastal areas from south-western to northern Australia, Queensland, NSW and Victoria. 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. The species is found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses. In arid north-western NSW, it has been observed in stony country with a ground cover of	No	Moderate	Suitable dry woodland habitat occurs within the Site. There are scattered records in the surrounding region. This species may occasionally occur in the Site and has potential to occur.

Scientific name	Common name	BC Status	EPBC Status	FM Status	Survey Months	Habitat requirements/constraints	SAII	Likelihood of occurrence	Justification
						chenopods and grasses, open acacia scrub and patches of low open eucalypt woodland.			
Motacilla flava	Yellow Wagtail	-	M, Ma		-	Northern hemisphere breeding. Widely distributed throughout mainland Australia. This species occupies a range of damp or wet habitats with low vegetation, from damp meadows, marshes, waterside pastures, sewage farms and bogs to damp steppe and grassy tundra.	No	Low	Extremely uncommon non-breeding migrant to Australia. No records nearby. Marginal habitat is present in the form of well-watered open grasslands. This species is considered unlikely to occur.
Myiagra cyanoleuca	Satin Flycatcher	-	M, Ma		-	The Satin Flycatcher is found along the east coast of Australia from far northern Queensland to Tasmania, including south-eastern South Australia. Found in tall forests, preferring wetter habitats such as heavily forested gullies, but not rainforests.	No	Moderate	Suitable Eucalypt grassy woodland habitat in proximity to riparian zones in the Site. Several records in proximity to the Site. This species may occur in the Site during the non-breeding season.
Neophema chrysostoma	Blue-winged Parrot	-	V		-	The Blue-winged Parrot occurs in grasslands and grassy woodlands of coastal, sub-coastal and inland areas and semi-arid zones, including disturbed environments. They forage amongst native and introduced grasses, herbs and shrubs for seeds. Non-breeding migrant to NSW from autumn to early spring.	No	Moderate	Suitable grassland and grassy woodland habitat is present on site. The Site is within its current non-breeding season distribution but there are no previous records within range of the Site. The species is considered to have the potential to occur.
Ninox connivens	Barking Owl	V	-		May - December	The Barking Owl is found throughout continental Australia except for the central arid regions. The owls sometimes extend their home range into urban areas, hunting birds in garden trees and insects attracted to streetlights. Extensive wildfires in 2019-20 reduced habitat quality further, burnt many old, hollow-bearing trees needed as refuge by prey species and reduced the viability of some regional owl populations. The species inhabit 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 NSW) due to the higher density of prey found on these fertile riparian soils. The species typically roost in shaded portions of tree canopies,	No	High	Suitable habitat occurs in the open woodland areas in the Site. The Barking Owl is found throughout eastern NSW and the Site is within the natural distribution range. This species is considered likely to occur in the Site.

Scientific name	Common name	BC Status	EPBC Status	FM Status	Survey Months	Habitat requirements/constraints	SAII	Likelihood of occurrence	Justification
						including tall midstorey trees with dense foliage such as Acacia and Casuarina species.			
Ninox strenua	Powerful Owl	V	-		May - August	The Powerful Owl is endemic to eastern and south-eastern Australia, mainly on the coastal side of the Great Dividing Range from Mackay to south-western Victoria. In NSW, it is widely distributed throughout the eastern forests from the coast inland to tablelands, with scattered records on the western slopes and plains suggesting occupancy prior to land clearing. Now at low densities throughout most of its eastern range, rare along the Murray River and former inland populations may never recover. The Powerful Owl inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest. The Powerful Owl requires large tracts of forest or woodland habitat but can occur in fragmented landscapes as well. The species breeds and hunts in open or closed sclerophyll forest or woodlands and occasionally hunts in open habitats. It roosts by day in dense vegetation comprising species such as Turpentine (*Syncarpia glomulifera)*, Black She-oak (*Allocasuarina littoralis*), Blackwood (*Acacia melanoxylon*), Rough-barked Apple (*Angophora floribunda*), Cherry Ballart (*Exocarpus cupressiformis*) and a number of eucalypt species.	No	High	Suitable habitat for the Powerful Owl is very limited in the Site. Only occurring in a small area in the west and central parts of the Site and adjacent areas outside the Site. This has been indicated in the shapefiles provided. This species is only considered likely to occur in a very small section of the Site.
Numenius madagascariensis	Far Eastern curlew	-	CE, M, Ma		-	Within Australia, the Eastern Curlew has a primarily coastal distribution. Eastern Curlews are rarely recorded inland. In NSW the species occurs across the entire coast but is mainly found in estuaries such as the Hunter River, Port Stephens, Clarence River, Richmond River and ICOLLs of the south coast. It generally occupies coastal lakes, inlets, bays and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats and sometimes saltmarsh of sheltered coasts.	No	Low	This species is considered unlikely to occur due to the lack of suitable habitat.
Petroica rodinogaster	Pink Robin	V	-		January - December	The Pink Robin is found in Tasmania and the uplands of eastern Victoria and far south-eastern NSW, almost as far north as Bombala. On the mainland, the species disperses	No	Low	This species is considered unlikely to occur due to the lack of suitable habitat

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						north and west and into more open habitats in winter, regularly as far north as the ACT area, and sometimes being found as far north as the central coast of NSW. The species inhabit rainforest and tall, open eucalypt forest, particularly in densely vegetated gullies.			and no previous records in the surrounding area.
Polytelis swainsonii	Superb Parrot	V	V		September - November	The Superb Parrot is 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. Birds breeding in this region are mainly absent during winter, when they migrate north to the region of the upper Namoi and Gwydir Rivers. The other main breeding sites are in the Riverina along the corridors of the Murray, Edward and Murrumbidgee Rivers where birds are present all year round. The species inhabit Box-Gum, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest.	No	Moderate	There is suitable woodland habitat in the Site which is in the known distribution of the species. This species is likely to be a visitor to the Site during the nonbreeding season from January - August.
Pycnoptilus floccosus	Pilotbird	-	V		-	Terrestrial species which lives on the ground of dense forests with heavy undergrowth, with Upland Pilotbirds found in the Snowy Mountains in New South Wales and Lowland Pilotbirds in forests from the Blue Mountains west of Newcastle and wet forests of eastern Australia. They build dome-shaped nests on or near the ground.	No	Low	The Site is on the outskirts of its current distribution and there are no records in proximity to the Site. Only marginal habitat is present, therefore this species is considered unlikely to occur.
Rhipidura rufifrons	Rufous Fantail	-	M, Ma		-	Found along the east coast of Australia from far northern Queensland to Tasmania, including south-eastern South Australia. Inhabits tall forests, preferring wetter habitats such as heavily forested gullies, but not rainforests.	No	Low	The Site is on the outskirts of its current distribution and there are no records in proximity to the Site. Only marginal habitat occurs within the Site, therefore this species is considered unlikely to occur.
Tyto novaehollandi	Masked Owl	V	-		May -August	The Masked Owl occurs 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. There is no seasonal variation in its distribution. This species lives in dry eucalypt forests and woodlands from sea level to 1100 m	No	Moderate	There is suitable dry woodland habitat in the Site. Previous records in the surrounding region are from intact forest systems. Due to the low quality of habitat present in the Site the species is considered to have the potential to occur.

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						an often hunts along the edges of forests, including roadsides. Roosts and breeds in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting.			
Rhipidura rufifrons	Rufous Fantail	-	M		-	Found along the east coast of Australia from far northern Queensland to Tasmania, including south-eastern South Australia. Inhabits tall forests, preferring wetter habitats such as heavily forested gullies, but not rainforests.	No	Low	There is a lack of suitable habitat and no previous records in the surrounding area. This species may pass through the site very occasionally.
Rostratula australis	Australian Painted Snipe	E	E, MA		-	In NSW, this species has been recorded at the Paroo wetlands, Lake Cowell, Macquarie Marshes and Hexham Swamp. Most common in the Murray-Darling Basin. Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. Nests on the ground amongst tall vegetation, such as grasses, tussocks or reeds.	No	Low	This species is considered unlikely to occur due to the lack of suitable habitat.
Invertebrates									
Paralucia spinifera	Purple Copper Butterfly, Bathurst Copper Butterfly	E	V		September - December	The Bathurst Copper Butterfly occurs on the Central Tablelands of NSW in an area approximately bounded by Oberon, Hartley and Bathurst. The butterfly is found at 35 locations, all within the Greater Lithgow, Bathurst Regional and Oberon local government areas. The species occurs above 850 m elevation, at sites with a south-west to north-west aspect, usually where direct sunlight reaches the habitat, and with extremes of cold such as regular winter snowfalls or heavy frosts. The species is commonly found in open woodland or open forest with a sparse understorey that is dominated by the shrub, Blackthorn *Bursaria spinosa* subsp. *lasiophylla*.	No	Low	There is no suitable habitat in the Site and the Site is outside the species distribution range. This species is considered unlikely to occur.
Synemon plana	Golden Sun Moth	V	V		October - December	The Golden Sun Moth's 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. The species occurs in Natural Temperate Grasslands and grassy Box-	Yes	Moderate	There is native grasslands throughout the Site. Grassland habitats were dominated by Spear Grass and also Wallaby Grass, Kangaroo Grass and Poa Tussock Grass. There are no previous records of this species in the surrounding region. Given the lack of any records in the surrounding

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						Gum Woodlands in which groundlayer is dominated by wallaby grasses *Austrodanthonia* spp.			areas this species is considered unlikely to occur.
Mammals									
Aepyprymnus rufescens	Rufous Bettong	V	-		January - December	The range of the Rufous Bettong has been reduced to a patchy distribution from Cooktown, Queensland, to north-eastern NSW as far south as Mt Royal National Park. In NSW it has largely vanished from inland areas but there are sporadic, unconfirmed records from the Pilliga and Torrington districts. Inhabits a variety of forests from tall, moist eucalypt forest to open woodland, with a tussock grass understorey. A dense cover of tall native grasses is the preferred shelter. Sleeps during the day in cone-shaped nests constructed of grass in a shallow depression at the base of a tussock or fallen log. At night feeds on grasses, herbs, seeds, flowers, roots, tubers, fungi and occasionally insects.	No	Low	Habitat on site is fragmented, no previous records within 10km of the Site or in the surrounding region. Due to there being no records in the surrounding region this species is considered unlikely to occur.
Cercartetus nanus	Eastern Pygmy-possum	V	-		January - December	The Eastern Pygmy-possum is found in south-eastern Australia, from southern Queensland to eastern South Australia and in Tasmania. In NSW it extends from the coast inland as far as the Pilliga, Dubbo, Parkes and Wagga Wagga on the western slopes. The species is found in a broad range of habitats from rainforest through sclerophyll (including Box-Ironbark) forest and woodland to heath, but in most areas woodlands and heath appear to be preferred, except in north-eastern NSW where they are most frequently encountered in rainforest. It feeds largely on nectar and pollen collected from banksias, eucalypts and bottlebrushes and is an important pollinator of heathland plants such as banksias; soft fruits are eaten when flowers are unavailable.	No	Low	Suitable habitat is present on site though it is considered to be low quality habitat for this species. There are no previous records within 10km of the Site and only four records in the Dubbo CMA region. Previous records were from intact forests and were not connected to the Site. Due to the poor quality habitat in the Site and no records within 50km of the Site boundary, this species is considered unlikely to occur.
Chalinolobus dwyeri	Large-eared Pied Bat	V	V		January - December	The Large-eared Pied Bat is found mainly in areas with extensive cliffs and caves, from Rockhampton in Queensland south to Bungonia in the NSW Southern Highlands. It is generally rare with a very patchy distribution in NSW. There are scattered records from the	Yes	Known	Foraging habitat present in the Site in the form of dry open forests. Also, Fairy Martin nesting in the Site. There were no limestone caves or cliff crevices in the Site. There were no previous records of

Scientific name	Common name	BC Status	EPBC Status	FM Status	Survey Months	Habitat requirements/constraints	SAII	Likelihood of occurrence	Justification
						New England Tablelands and North West Slopes. The species roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (*Petrochelidon ariel*), frequenting low to mid-elevation dry open forest and woodland close to these features. Females have been recorded raising young in maternity roosts (c. 20-40 females) from November through to January in roof domes in sandstone caves and overhangs. It is found in well-timbered areas containing gullies.			this species in the surrounding region (Dubbo CMA). This species was recorded calling within the Site and therefore is known to occur.
Miniopterus orianae oceanensis	Large Bent-winged Bat	V	-		-	Large Bentwing-bats occur along the east and north-west coasts of Australia. The species use caves as the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures.	No	Known	While no cave systems were recorded during the current field work, suitable foraging habitat was observed in the Site at woodlands and over farm dams and along water courses. This species was recorded in the Site.
Myotis macropus	Southern Myotis	V	-		January - December	The Southern Myotis is mainly coastal but may occur inland along large river systems. Usually associated with permanent waterways at low elevations in flat/undulating country, usually in vegetated areas. Forages over streams and watercourses feeding on fish and insects from the water surface. Roosts in a variety of habitats including caves, mine shafts, hollow-bearing trees, stormwater channels, buildings, under bridges and in dense foliage, typically in close proximity to water.	No	Moderate	There is limited habitat at the Site in aquatic areas and woodlands. This species may occasionally occur at the Site and has potential to occur.
Petauroides volans	Greater Glider	E	E		January - December	The greater glider is restricted to eastern Australia, occurring from the Windsor Tableland in north Queensland through to central Victoria (Wombat State Forest), with an elevational range from sea level to 1200 m above sea level. It prefers taller montane, moist eucalypt forest with relatively old trees and abundant hollows.	No	Low	This species is considered unlikely to occur due to the lack of suitable habitat and Site located outside the species distribution range.
Petaurus norfolcensis	Squirrel Glider	V	-		January - December	The Squirrel Glider is widely though sparsely distributed in eastern Australia, from northern Queensland to western Victoria. The species inhabits mature or old	No	Moderate	Ironbark habitat in the Site. For the most part woodlands lacked hollows though some areas did contain hollows. Previous

Scientific name	Common name	BC Status	EPBC Status	FM Status	Survey Months	Habitat requirements/constraints	SAII	Likelihood of occurrence	Justification
						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.			records are scattered throughout the surrounding region. Due to the presence of suitable habitat and previous records in the surrounding region this species is considered to have potential to occur.
Petrogale penicillata	Brush-tailed Rock-wallaby	E	V		January - December	In NSW the Brush-tailed Rock-wallaby occurs from the Queensland border in the north to the Shoalhaven in the south, with the population in the Warrumbungle Ranges being the western limit. The species occupy rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges, often facing north. It typically shelters or basks during the day in rock crevices, caves and overhangs and are most active at night when foraging.	Yes	Low	This species is considered unlikely to occur due to the lack of suitable habitat.
Phascogale tapoatafa	Brush-tailed Phascogale	V	-		January - December	The Brush-tailed Phascogale has a patchy distribution around the coast of Australia. In NSW it is mainly found east of the Great Dividing Range although there are occasional records west of the divide. The species prefer dry sclerophyll open forest with sparse groundcover of herbs, grasses, shrubs or leaf litter.	No	Low	Suitable Box-Ironbark habitat was present in the Site. There were few hollow bearing trees across the Site, almost absent on ridges, more abundant in old growth trees on slopes and low-lying areas. There were no previous records in the surrounding region of the Site. Due to the lack or records in the surrounding area this species is considered unlikely to occur.
Phascolarctos cinereus	Koala	E	E		-	The Koala has a fragmented distribution throughout eastern Australia from north-east Queensland to the Eyre Peninsula in South Australia. In New South Wales, 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. The species inhabit eucalypt woodlands and forests, and feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species.	No	Moderate	There are 4 Koala records within 10km, most recently in 2019 (DPE 2023a). There are no primary food trees in the Site though there are secondary food trees including Blakley's Red Gum, Yellow Box, White Box and Tumbledown Gum. There are limited previous records in the surrounding area. Due to the presence of secondary food trees within the Site and nearby records, the Koala is considered to have the potential to occur..

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Pteropus poliocephalus	Grey-headed Flying-fox	V	V		-	Grey-headed Flying-foxes are generally found within 200 km of the eastern coast of Australia, from Rockhampton in Queensland to Adelaide in South Australia. In times of natural resource shortages, they may be found in unusual locations. The species occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy.	No	High	There are 2 Grey-headed Flying-Foxes records within 10km, most recently in 2016 (DPE 2023), and there is suitable foraging habitat in the Site. There are known roosting colonies at Mudgee and Wellington where both Grey-headed Flying-Fox and Little Red Flying-Fox have been recorded in numbers from 2,5009,999 individuals. The Grey-headed Flying-Fox may be abundant in the Site during mass flowering events of Eucalyptus species. This species is considered likely to occur.
Vespadelus troughtoni	Eastern Cave Bat	V	-		January - December	The Eastern Cave Bat is found in a broad band on both sides of the Great Dividing Range from Cape York to Kempsey, with records from the New England Tablelands and the upper north coast of NSW. The western limit appears to be the Warrumbungle Range, and there is a single record from southern NSW, east of the ACT. The Eastern Cave Bat is a cave-roosting species that is usually found in dry open forest and woodland, near cliffs or rocky overhangs; has been recorded roosting in disused mine workings, occasionally in colonies of up to 500 individuals. This species is occasionally found along cliff-lines in wet eucalypt forest and rainforest. They forage over a small area, but are capable of flying 500 m over clear paddocks.	Yes	Low	This species is considered unlikely to occur in the Site due to lack of suitable habitat.
Reptiles									
Aprasia parapulchella	Pink-tailed Legless Lizard	V	V		September - November	The Pink-tailed Legless Lizard is 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. This species is also found in the Australian Capital Territory. It's found to inhabit sloping, open	No	Low	There is suitable habitat for this species in the Site in the form of rocky habitats. There are rocky habitats scattered across the Site along ridges, slopes and low-lying areas. Rock rolling was undertaken opportunistically while traversing across the site. No reptiles were observed in

Scientific name	Common name	BC Status	EPBC Status	FM Status	Survey Months	Habitat requirements/constraints	SAII	Likelihood of occurrence	Justification
						woodland areas with predominantly native grassy ground-layers, particularly those dominated by Kangaroo Grass (Themeda australis), The sites are typically well-drained, with rocky outcrops or scattered, partially-buried rocks. They are commonly found beneath small, partially-embedded rocks and appear to spend considerable time in burrows below these rocks; the burrows have been constructed by and are often still inhabited by small black ants and termites.			these areas which suggests that reptile biodiversity is low at the site despite suitable habitat being present. Some areas of rocky habitats have been altered from the original condition by the removal of overstorey trees. There were no previous records within 10km or within the Dubbo CMA. Given there are no previous records and the altered state of the suitable habitat in the Site this species is considered unlikely to occur.
Delma impar	Striped Legless Lizard	V	V		September - December	The Striped Legless Lizard 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. Individuals are found mainly in Natural Temperate Grassland but has also been captured in grasslands that have a high exotic component. They are also found in secondary grassland near Natural Temperate Grassland and occasionally in open Box-Gum Woodland.	No	High	Suitable habitat is present in areas of native grassland. Native grasslands were found throughout the Site. There were only two areas of improved pasture dominated by non-native species observed during the current field work. This species is considered likely to occur.
Hoplocephalus bitorquatus	Pale-headed Snake	V	-		January - December	In NSW the Pale-headed Snake has historically been recorded from as far west as Mungindi and Quambone on the Darling Riverine Plains, across the north west slopes, and from the north coast from Queensland to Sydney. A small number of historical records are known for the New England Tablelands from Glenn Innes and Tenterfield; however, the majority of records appear to be from sites of relatively lower elevation. Although the Pale-headed snake distribution is very cryptic, it now appears to have contracted to a patchy and fragmented distribution. The species is found mainly in dry eucalypt forests and woodlands, cypress forest and occasionally in rainforest or moist eucalypt forest.	No	Low	Suitable dry eucalyptus habitat present in the Site. No previous records close to the Site and only one previous record within the Dubbo CMA that was located in an intact forest almost 200km from the Site boundary. Due to the low quality of habitat present and the lack of recent and regular records in the surrounding region this species is considered unlikely to occur.

Scientific name	Common name	BC Status	EPBC Status	FM Status	Survey Months	Habitat requirements/constraints	SAII	Likelihood of occurrence	Justification
Hoplocephalus bungaroides	Broad-headed Snake	E	V		-	The Broad-headed Snake is largely confined to Triassic and Permian sandstones, including the Hawkesbury, Narrabeen and Shoalhaven groups, within the coast and ranges in an area within approximately 250 km of Sydney. The species shelters in rock crevices and under flat sandstone rocks on exposed cliff edges during autumn, winter and spring.	Yes (Breeding)	Low	No suitable habitat present in the Site. Unlikely to occur.
Tympanocryptis mccartneyi	Bathurst Grassland Earless Dragon	CE	CE		-	Distribution restricted to naturally treeless native tussock grasslands on granite- and basalt-derived alluvial plains and rises around Bathurst in the Central Tablelands of New South Wales based on only three known records. Their biology and habitat requirements are poorly understand, and the species is presumed extinct.	No	Low	Only known to occur between Bathurst and the Blue Mountains and considered possibly extinct. No records within 10 km. Suitable open grassy woodland habitat with rocky crevices occurs within the Site. Due to the highly limited distribution and lack of records nearby, this species is considered unlikely to occur.

Note: Habitat descriptions taken from the relevant profiles on the DPIE Threatened Species website and/or DCCEEW SPRAT database unless otherwise stated. CE – Critically Endangered, E – Endangered, V – Vulnerable, X – Extinct, M – Migratory, Ma – Marine

Migratory Species

Migratory species relevant to the Project are limited to the White-throated Needletail (*Hirundapus caudacutus*). An assessment of likely significant impacts to this species is presented here in accordance with the significant impact criteria for migratory species.

It should be noted that White-throated Needletail has not been recorded within the Study Area and presence of the species is assumed for the purpose of the assessment given a lack of targeted survey activities.

White-throated Needletail (*Hirundapus caudacutus*) (Vulnerable)	
Distribution Migratory and usually seen in eastern Australia from October to April. Breeds in forests in south-eastern Siberia, Mongolia, the Korean Peninsula and northern Japan June-August. Most often seen in eastern Australia before storms, low pressure troughs and approaching cold fronts and occasionally bushfire. These conditions are often used by insects to swarm (eg termites and ants) or tend to lift insects away from the surface which favours sighting of White-throated Needletails as they feed. More common in coastal areas, less so inland. **Habitat requirements** In Australia, the White-throated Needletail is almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground. Because they are aerial, it has been stated that conventional habitat descriptions are inapplicable, but there are, nevertheless, certain preferences exhibited by the species. Although they occur over most types of habitat, they are recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland. They also commonly occur over heathland, but less often over treeless areas, such as grassland or swamps. When flying above farmland, they are more often recorded above partly cleared pasture, plantations or remnant vegetation at the edge of paddocks. In coastal areas, they are sometimes seen flying over sandy beaches or mudflats, and often around coastal cliffs and other areas with prominent updraughts, such as ridges and sand-dunes. They are sometimes recorded above islands well out to sea. **Survey/records within the Site and surrounds and impact summary** While targeted surveys were not conducted as part of the study, no White-throated Needletail individuals were detected during the survey. Further, there are no records of this species within the Study Area or 10 km of it, or within the Dubbo CMA. Field surveys determined that there is potential foraging habitat for the White-throated Needletail within and above the site's various woodland PCTs (excluding the derived native grasslands condition), which make up approximately 3,993.66 ha (45%) of the site (Figure 4). Construction impacts (i.e. removal of vegetation) are not likely to pose a significant risk to this species since the development footprint is largely concentrated in areas that are already predominately cleared. Furthermore, the White-throated Needletail is a highly mobile species capable of foraging over very large ranges, as such the removal of vegetation for the Project would have little impact on foraging for this species. Despite the above, Project operations may pose a significant risk to the species as a result of turbine collision risk. Based on the review of conservation advice for the species, collision with structures such as overhead wires, windows and lighthouses are considered one of the few threats to this species (DCCEEW, 2023). Wind turbines associated with the project may pose an ongoing threat to this species, where it is confirmed to forage within or traverse the site on a regular or seasonal basis.	
Assessment of significance *An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will:*	
Criteria	**Address of Criteria**
substantially modify (including by fragmenting, altering fire	Important habitat for this species includes: "a range of habitats, more often over wooded areas, where it is almost exclusively aerial. Large tracts of native vegetation, particularly forest, may be a key habitat requirement for species. Found to roost in tree hollows in tall trees on ridge-tops, on bark or rock faces. Appears to have traditional roost sites" (DoE 2015).

White-throated Needletail (*Hirundapus caudacutus*) (Vulnerable)	
regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species	Historically, the site and surrounding areas have been extensively cleared for agricultural purposes. Whilst the Project footprint prioritises existing cleared lands, approximately 109.46 ha of dry woodland offering potential habitat for White-throated Needletail would be impacted. Vegetation disturbance would largely occur during construction as a result of site clearing activities. Given the early stage of the Project design, the extent of temporary versus permanent clearing impacts cannot be established. However, all areas disturbed temporarily are expected to be regenerated post-works. Regardless, clearing activities are likely to result in further fragmentation and degradation of woodland habitats within the Site. Given this, the Project is likely to substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for this 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	The Study Area is likely subject to existing threats from pest plants and animals as a result of historical and ongoing land uses. Weeds recorded during the field survey are noted in Section 3.2.1 of this report. Pig activity was observed during field surveys. Other pest animals likely to be present on the site include Wild Dog, Goat, Feral Cats, Feral Deer, European Rabbit and Red Fox. Where appropriate construction controls are implemented, it is unlikely the Project would result in any new weed or pest introduction or increase the spread of existing threats within the site.
seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.	Collision with structures such as overhead wires, windows and lighthouses are considered one of the few threats to this species. Wind turbines associated with the Project may pose an ongoing threat to this species, where it is confirmed to forage within or traverse the site on a regular or seasonal basis. The White-throated Needletail is generally gregarious when in Australia, sometimes occurring in large flocks, comprising hundreds or thousands of birds, though they are occasionally seen solitary. The ecologically significant proportion of a population that is considered nationally important for birds that aggregate in flocks is 0.1% which is approximately 10 individuals. Considering the location of suitable habitats within the site, their proximity to proposed turbines and the aerial flying behaviour of the species, the chances of over 10 White-throated Needletail mortalities as a result of wind turbine collision over the life of the development would be considered likely. As such, the Project has potential to seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of White-throated Needletail. Targeted surveys are recommended to confirm to what extent habitats within the Site are utilised or traversed by the species to inform any collision risks and appropriate mitigation measures.
Conclusion: The Project is considered likely to have a significant impact on the White-throated Needletail.	

Appendix 3 – EPBC Act Protected Matters Search Tool Results

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: 31-Jul-2023

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:	4
Listed Threatened Species:	48
Listed Migratory Species:	11

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:	3
Commonwealth Heritage Places:	None
Listed Marine Species:	18
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:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	7
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	800 - 900km upstream from Ramsar site	In feature area
Riverland	700 - 800km upstream from Ramsar site	In feature area
The coorong, and lakes alexandrina and albert wetland	900 - 1000km upstream from Ramsar site	In feature area
The macquarie marshes	200 - 300km upstream from Ramsar site	In feature area

Listed Threatened Ecological Communities			[Resource Information]
For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps. Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.			
Community Name	Threatened Category	Presence Text	Buffer Status
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Endangered	Community likely to occur within area	In feature area
Natural Temperate Grassland of the South Eastern Highlands	Critically Endangered	Community may 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 known to occur within area	In feature area
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area	In feature area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat likely to occur within area	In feature area
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
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Lophochroa leadbeateri leadbeateri Major Mitchell's Cockatoo (eastern), Eastern Major Mitchell's Cockatoo [82926]	Endangered	Species or species habitat may occur within area	In buffer area only
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat likely to occur within area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	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
Pycnoptilus floccosus Pilotbird [525]	Vulnerable	Species or species habitat may 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			
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 may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
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
MAMMAL			
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely 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 likely to occur within area	In feature area
Petauroides volans Greater Glider (southern and central) [254]	Endangered	Species or species habitat may occur within area	In buffer area only
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 known to occur within area	In feature area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat may occur within area	In feature area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
PLANT			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Dichanthium setosum bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Euphrasia arguta [4325]	Critically Endangered	Species or species habitat may occur within area	In feature area
Homoranthus darwinioides [12974]	Vulnerable	Species or species habitat may occur within area	In feature area
Lepidium aschersonii Spiny Peppercress [10976]	Vulnerable	Species or species habitat may occur within area	In feature area
Leucochrysum albicans subsp. tricolor Hoary Sunray, Grassland Paper-daisy [89104]	Endangered	Species or species habitat may occur within area	In buffer area only
Ozothamnus tesselatus [56203]	Vulnerable	Species or species habitat may occur within area	In feature area
Prasophyllum petilum Tarengo Leek Orchid [55144]	Endangered	Species or species habitat may occur within area	In feature area
Prasophyllum sp. Wybong (C.Phelps ORG 5269) a leek-orchid [81964]	Critically 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 feature area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Vincetoxicum forsteri listed as Tylophora linearis [92384]	Endangered	Species or species habitat may occur within area	In feature area
Zieria obcordata Granite Zieria [3240]	Endangered	Species or species habitat may occur within area	In buffer area only
REPTILE			
Aprasia parapulchella Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Delma impar Striped Legless Lizard, Striped Snake-lizard [1649]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Tympanocryptis mccartneyi Bathurst Grassland Earless Dragon [90478]	Critically Endangered	Species or species habitat may occur within area	In buffer area only

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known 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 likely to occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area	In feature area
[Numenius madagascariensis](#) Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	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 Trading Bank of Australia		
Commonwealth Land - Commonwealth Trading Bank of Australia [13261]	NSW	In buffer area only
Commonwealth Land - Commonwealth Trading Bank of Australia [13262]	NSW	In buffer area only
Communications, Information Technology and the Arts - Telstra Corporation Limited		
Commonwealth Land - Australian Telecommunications Commission [13263]	NSW	In buffer area only

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		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 known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat likely to occur within area overfly marine area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat may 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

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Burrendong Wind Farm	2021/8916	Controlled Action	Assessment Approach	In feature area
Narrabri to Wellington gas transmission pipeline	2011/5913	Controlled Action	Completed	In buffer area only
Open cut coal mine & associated infrastructure	2011/6158	Controlled Action	Post-Approval	In buffer area only
Uungula Wind Farm, Goolma, NSW	2013/7026	Controlled Action	Post-Approval	In feature area
Wollar to Wellington 330kV Transmission Line Project	2005/2202	Controlled Action	Post-Approval	In buffer area only
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
Not controlled action (particular manner)				
Aerial baiting for wild dog control	2006/2713	Not Controlled Action (Particular Manner)	Post-Approval	In feature area

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data 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

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-Department of Environment and Primary Industries, Victoria
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-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
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-Geoscience Australia
-CSIRO
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-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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