Global Power Generation Australia

Preliminary Biodiversity Values Report

Paling Yards Wind Farm

22 September 2021

Project No.: 0578575

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Signature Page

21 September 2021

Preliminary Biodiversity Values Report

Paling Yards Wind Farm

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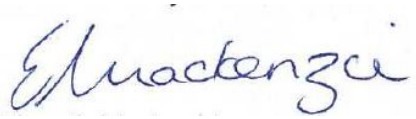

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Acronyms and Abbreviations

Name	Description
ALA	Atlas of Living Australia
AOBV	Areas of Outstanding Biodiversity Value
BAM	Biodiversity Assessment Method
Bc Act	NSW Biodiversity Conservation Act 2016
BDAR	Biodiversity Development Assessment Report
BioNet VIS	BioNet Vegetation Information System
BOS	Biodiversity Offsets Scheme
BOSET	Biodiversity Offsets Scheme Entry Threshold
BUS	Bird Utilisation Survey
CEEC	Critically Endangered Ecological Community
DoEE	Commonwealth Department of Environment and Energy
EIS	Environmental Impact Assessment
EP&A Act	Environmental Planning and Assessment Act 1979
EPBC act	Environment Protection and Biodiversity Conservation Act 1999
ERM	Environmental Resources Management
GPGA	Global Power Generation Australia Pty Ltd
IBRA	Interim Biographic Regionalisation of Australia
kV	Kilovolt
LGA	Local Government Areas
LLS Act	Local Land Services Act 2013
MNES	Matters of National Environmental Significance
MW	Megawatts
PCT	Plant Community Types
PMST	Protected Matters Search Tool
RSA	Rotor Swept Area
SAT	Spot Assessment Technique
SEPP	State Environmental Planning Policy
SER	Supplementary Ecology Report
SSD	State Significant Development
TEC	Threatened Ecological Communities
WoNS	Weeds of National Significance
WTG	Wind Turbine Generator

EXECUTIVE SUMMARY

Global Power Generation Australia Pty Ltd (GPGA or the Proponent), formerly known as Union Fenosa Wind Australia Pty Ltd, propose to construct and operate the Paling Yards Wind Farm (the project), a renewable energy development located to the south of Oberon in the Central Tablelands of New South Wales (NSW). ERM have prepared this Preliminary Biodiversity Values Report to inform the Scoping Report and preliminary project design. The most recent field survey effort in February 2021 was completed by Hunter Ecology and ERM.

The construction and operation of the Project has the potential to cause impacts to threatened species and ecological communities listed under the Biodiversity Conservation Act 2016, and these will need to be considered as part of the Environmental Impact Statement (EIS) to be prepared under Part 5 of the NSW EP&A Act. As there are recorded Biodiversity values within the Project site, application of the Biodiversity Assessment Methodology (BAM) and the preparation of a Biodiversity Development Assessment Report (BDAR) will be required.

In this instance the main potential impacts of the project (during construction and operation) that would need to be assessed include:

- Clearing of Threatened Ecological Communities (TECs);
- Loss of extant native vegetation communities and associated fauna habitat and the subsequent impacts to local population of native species, particularly threatened and migratory species;
- Increased habitat fragmentation;
- Mortality and injury of avian and microchiropteran species from turbine strike;
- Mortality and injury from vehicle strikes and vegetation clearing; and
- Mortality and injury from baratrauma.

Mitigation measures relevant to threatened species, TECs, native vegetation communities, species vulnerable to turbine strikes, hydrology and construction impacts will be addressed within the EIS. There is also a risk that weeds may be transported within and off-site. Mitigation measures to reduce the chance of the spread of weeds will be considered within the EIS.

The following steps are considered essential in ensuring an adequate assessment of biodiversity values is continued throughout future stages of the project:

- Prepare and submit a BDAR in accordance with the BAM;
- Prepare a detailed assessment of Commonwealth Matters of National Environmental Significance (MNES);
- Conduct detailed habitat mapping and native vegetation mapping for all direct impact areas (e.g. the development footprint); and
- Conduct further targeted seasonal fauna and flora surveys in October 2021 for species considered likely or potentially occurring within the project boundary in accordance with relevant federal or State survey guidelines.

1. INTRODUCTION

Global Power Generation Australia Pty Ltd (GPGA or the Proponent), formerly known as Union Fenosa Wind Australia Pty Ltd, propose to construct and operate the Paling Yards Wind Farm (the project), a renewable energy development located to the south of Oberon in the Central Tablelands of New South Wales (NSW). The project boundary and indicative layout is identified in Figure 1.1.

ERM have prepared this Preliminary Biodiversity Values Report to inform the Scoping Report and preliminary project design. ERM was previously engaged to complete an Environmental Impact Assessment (EIS) for the Proponent in January 2014 (ERM, 2014) and completed biodiversity field surveys in 2013 to inform the original EIS.

The most recent field survey effort in February 2021 was completed by Hunter Ecology and ERM.

1.1 Objectives

The objective of this assessment is to identify and describe biodiversity values within the project boundary. This assessment allows preliminary recommendations to be provided in terms of avoidance, mitigation and/or additional assessment for biodiversity values. For the purpose of this preliminary assessment, biodiversity values include:

- Native species and communities with a particular focus on those listed as migratory, vulnerable, endangered or critically endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the NSW *Biodiversity Conservation Act 2016* (BC Act);
- Fauna species susceptible to turbine strikes (e.g. raptors); and
- Important habitat components (e.g. hollow-bearing trees) and landscape features.

This report is informed by a combination of:

- Review of past biodiversity assessments at the site as reported by ERM (2014);
- Updated desktop assessment;
- Fieldwork completed during Summer 2021 (February), which included:
  - Biodiversity Assessment Method (BAM) plot surveys;
  - Targeted fauna surveys; and
  - Habitat and landscape values assessments.

The report includes:

- Identification of threatened species and threatened ecological communities, important habitat components and landscape features, and fauna species susceptible to turbine strikes; and
- A description of outcomes and recommendations to support the ongoing project design and assessment process.

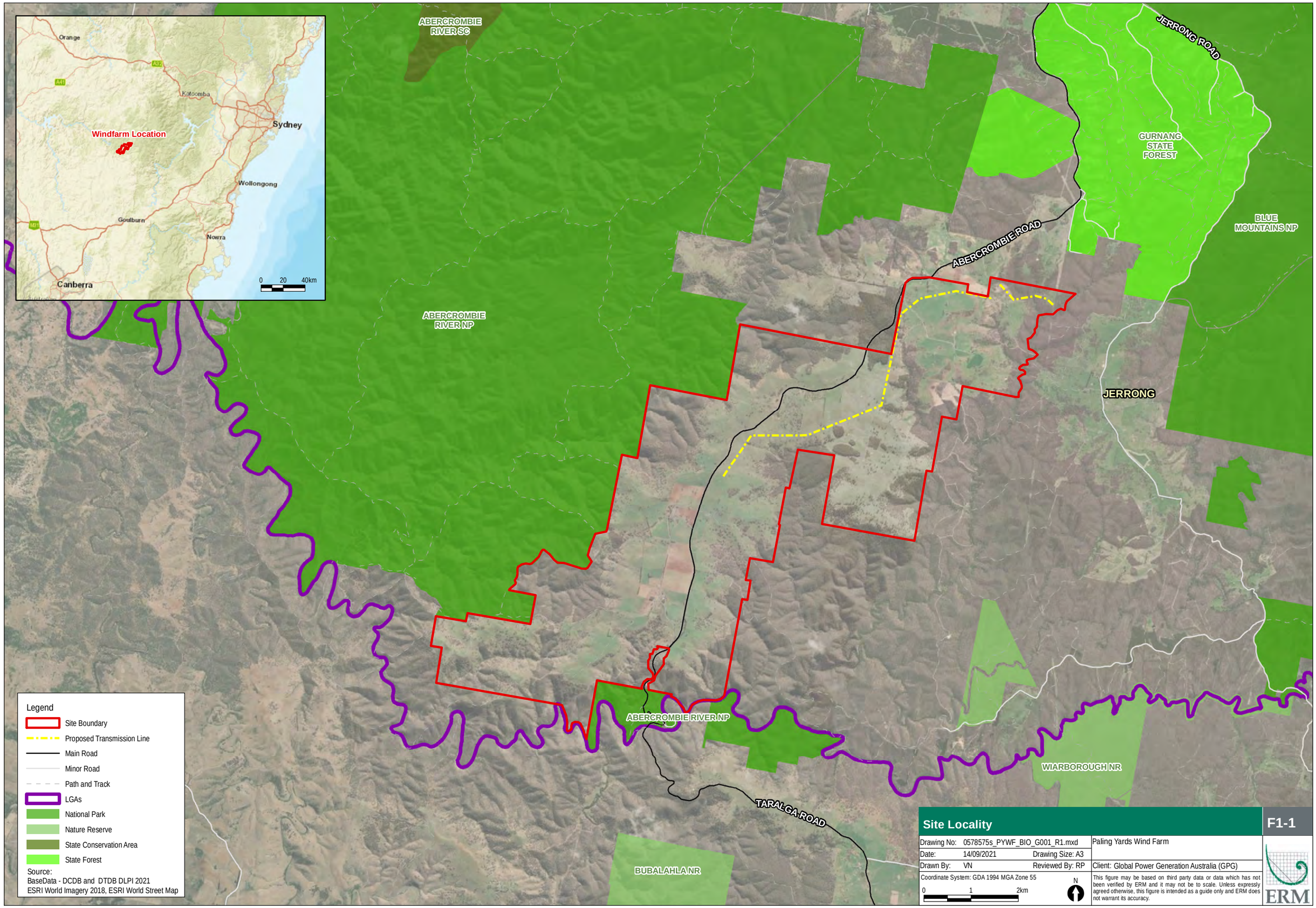
It must be noted that additional field surveys are planned to be conducted by Hunter Ecology in late 2021 and have not been included in this preliminary assessment.

1.2 Project Overview

The project is proposed to consist of up to 47 wind turbine generator (WTG) locations with an estimated capacity of 6 megawatts (MW) each. A maximum tip height of 240 metres is currently proposed.

The project would also include:

- Corresponding individual kiosks for the housing of transformers, switchgear and associated control systems;
- Transmission corridor of approximately 9km long and 70m wide with poles 200 – 250 m apart;
- Three (3) meteorological monitoring masts, fitted with anemometers, wind vanes, temperature gauges and other electrical equipment;
- Wind farm and substation control room and facilities building;
- Obstacle lighting to selected turbines (if deemed necessary);
- On-site electrical substation and approximately 9.0 km of overhead power line of up to 500kV;
- Underground electrical and communication cable network linking turbines to each other and the proposed on-site substation;
- Removal of native vegetation and additional vegetation planting to provide screening;
- Upgrades to existing local road infrastructure including several access points from Abercrombie Road and establishment of internal unsealed tracks for access to turbines and infrastructure; and
- Temporary batching plant to supply concrete during the construction phase.



Site Locality

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Coordinate System: GDA 1994 MGA Zone 55

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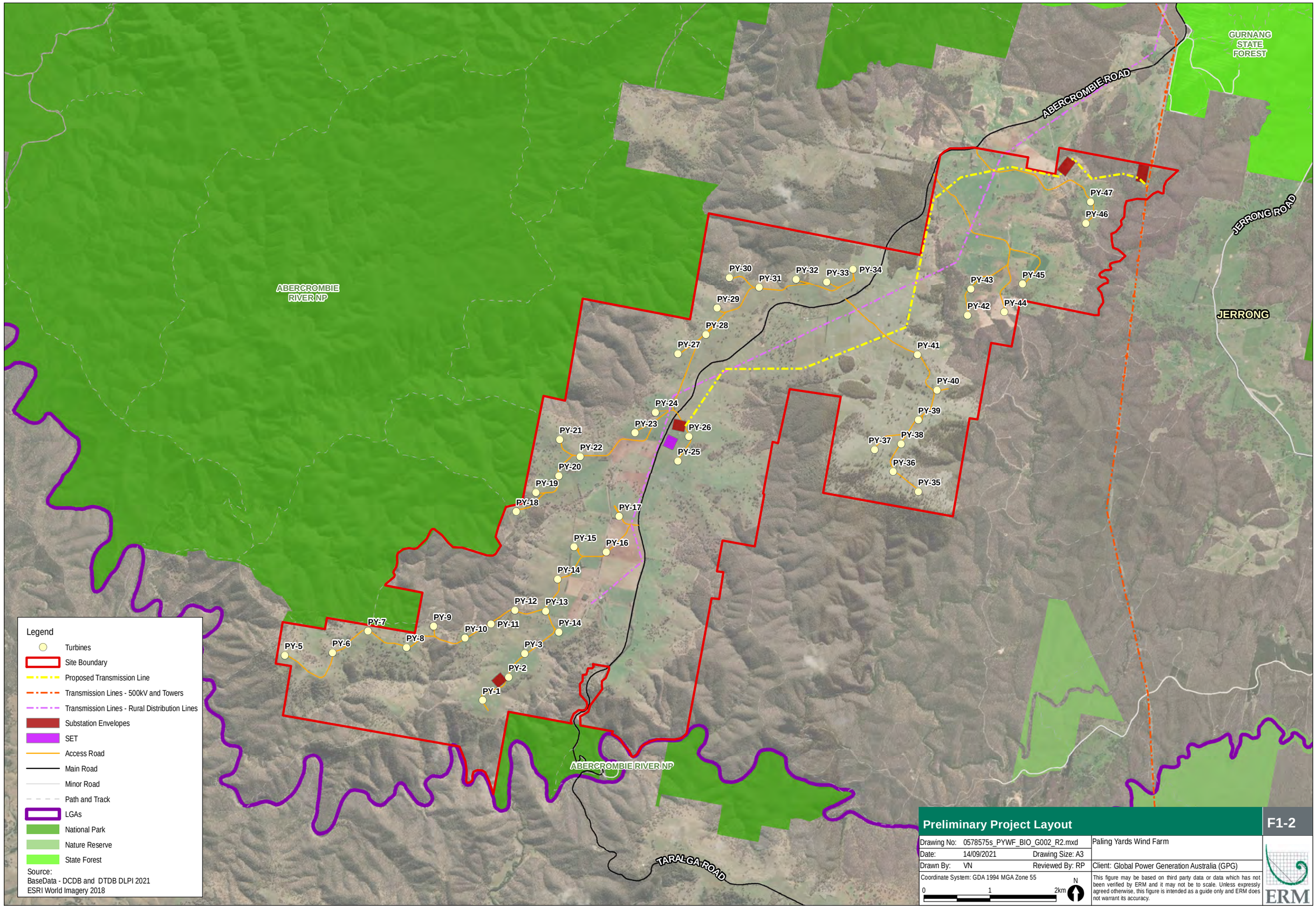
GURNANG STATE FOREST
ABERCROMBIE ROAD
JERRONG ROAD
JERRONG
ABERCROMBIE RIVER NP
ABERCROMBIE RIVER NP
TARALGA ROAD
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Transmission Lines - Rural Distribution Lines
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Main Road
Minor Road
Path and Track
LGAs
National Park
Nature Reserve
State Forest
Source:
BaseData - DCDB and DTDB DLPI 2021
ESRI World Imagery 2018
Preliminary Project Layout
F1-2
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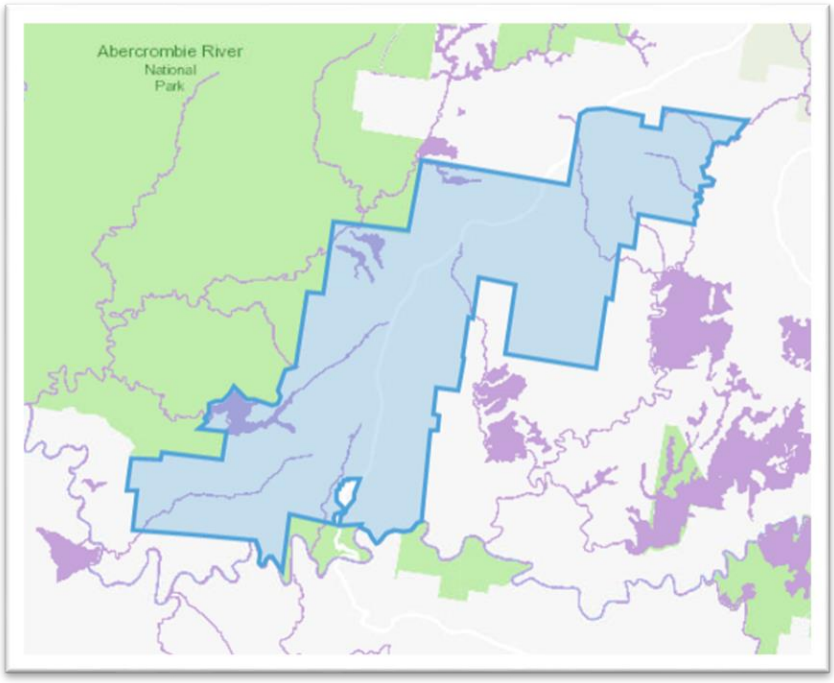
2. LEGISLATION

Table 2.1 below provides a description of the relevant legislative context. This report addresses the objectives and requirements of the legislation as it relates to the identification of biodiversity and ecological values. Impacts to these values will be addressed separately if required as part of the EIS to be prepared.

Table 2.1 Legislation applicable to this Preliminary Biodiversity Assessment

Commonwealth Legislation
Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
The EPBC Act requires approval of the Commonwealth Minister for the Environment for actions that are likely to have a significant impact on Matters of National Environmental Significance (MNES) as assessed in accordance with the EPBC Significant Impact Guidelines 1.1. The EPBC Act is administered by the Commonwealth Department of Environment and Energy (DoEE) and lists threatened species, ecological communities and other MNES. Any proposed action that is expected to have an impact on MNES must be referred to the Minister for assessment under the EPBC Act, or assessed under the existing bilateral agreement, or accredited process between the Commonwealth and the State of New South Wales (NSW). A referral for a windfarm development across the project site was submitted to the Federal Department of Environment and Heritage in February 2005. In March 2005, the Minister declared that the action is not a controlled action and approval under Part 9 of the EPBC Act was not required (EPBC Reference 2005/2018). As outlined within Section 5, the ecological desktop and field studies undertaken to date have not revealed any additional MNES that would require further assessment under the EPBC Act. The need for the project to be referred to the Australian Government Minister for the Environment will be confirmed following additional seasonal survey and assessment.
NSW Statutory Legislation and Guidelines
Biodiversity Conservation Act 2016 (BC Act)
The BC Act came into effect on 25 August 2017. The BC Act replaced the NSW *Threatened Species Conservation Act 1995*, the NSW *Nature Conservation Trust Act 2001* and parts of the NSW *National Parks and Wildlife Act 1974*. The BC Act establishes mechanisms for: The management and protection of listed threatened species of native flora and fauna (excluding fish and marine vegetation) and threatened ecological communities (TECs). ■ The listing of threatened species, TECs and key threatening processes; ■ The development and implementation of recovery and threat abatement plans; ■ The declaration of critical habitat; ■ The consideration and assessment of threatened species impacts in development assessment process; and ■ Biodiversity Offsets Scheme (BOS), including the Biodiversity Values Map and Biodiversity Assessment Method (BAM) to identify serious and irreversible impacts (SAII). The BC Act establishes a new regulatory framework for assessing and offsetting biodiversity impacts on proposed developments. Where development consent is granted, the authority may impose as a condition of consent an obligation to retire a number and type of biodiversity credits determined under the Biodiversity Assessment Method (BAM). A Biodiversity Values Map and Biodiversity Offsets Scheme Entry Threshold (BOSET) tool are available to identify the presence of mapped biodiversity values within land proposed for development as well as the clearing thresholds that would trigger application of the BAM. Areas of High Biodiversity Value are mapped within the project boundary and are associated with Abercrombie River, Black Bett Creek and Paling Yard Creek. Oaky Creek to the north is also mapped as High Biodiversity Value.



https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BOSETMap

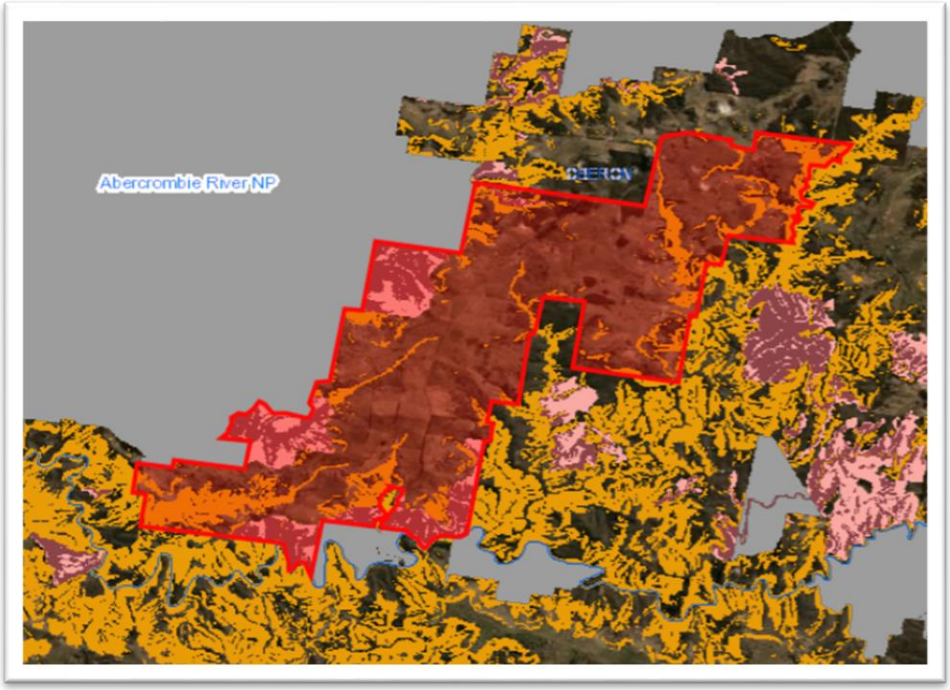
The Biodiversity Offsets Scheme applies to state significant development and state significant infrastructure projects, unless the Secretary of the Department of Planning, Industry and Environment determines that the Proposal is not likely to have a significant impact. As this is an SSD development and there are recorded biodiversity values within the project boundary, application of the BAM and the preparation of a BDAR will be required.

Local Land Services Act 2013

The Local Land Services Act 2013 (LLS Act) regulates the management of vegetation on rural land. The amendments to the LLS Act have resulted in a change to the criteria for native vegetation clearing. There are now three different land categories for clearing on rural land:

- Category 1 – 'Exempt land' which will not be subject to clearing approval;
- Category 2 – 'Regulated Land' on which clearing of native vegetation may be carried out with or without approval in accordance with an 'allowable activity' or 'code' under the LLS Act, and
- 'Excluded Land' – Land not categorised in the Regulatory Maps and to which the LLS Act does not apply.

A review of the Native Vegetation Regulatory Map (Regulatory Map) confirms that the project boundary is mapped as category 2 – sensitive regulated land and category 2 – vulnerable regulated land. This will be further explored as part of the EIS process.



https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=NVRMap

Biosecurity Act 2015

The NSW *Biosecurity Act 2015* came into effect on 1 July 2017, effectively replacing the *Noxious Weeds Act 1993*, and 13 other Acts, with a single Act. Under the Noxious Weeds Act all landowners had a responsibility to control noxious weeds on their property. Under the Biosecurity Act broadly the same responsibility will apply and will be known as a General Biosecurity Duty.

The General Biosecurity Duty states "*Any person who deals with biosecurity matter or a carrier and who knows, or ought reasonably to know, the biosecurity risk posed or likely to be posed by the biosecurity matter, carrier or dealing has a biosecurity duty to ensure that, so far as is reasonably practicable, the biosecurity risk is prevented, eliminated or minimised*." The general biosecurity duty applies to all weeds listed in Schedule 3 of the Biosecurity Act. Primary weeds have been identified in different Local Government Areas (LGA) due to the level of threat infestation they represent, some of the Weeds of National Significance (WoNS) are also listed as Primary Weeds in LGAs.

A strategic plan for each weed will be required at each site to define responsibilities and identify strategies and actions to control the weed species. These can be downloaded from: http://www.environment.gov.au/biodiversity/invasive/weeds/weeds/lists/wons.html

Fisheries Management Act 1994

The *Fisheries Management Act 1994* provides for the conservation, protection and management of fisheries, aquatic systems and habitats in NSW. Similar to the BC Act, the *Fisheries Management Act 1994* lists threatened species, populations and ecological communities of fish and marine vegetation. Consideration of likely occurrence of threatened fish in the waterways in the Proposal site will be provided within the EIS although it is noted that the Murray River and Murrumbidgee River provide potential habitat for the Flathead Galaxias and Macquarie Perch. The smaller ephemeral streams also provide potential habitat for the Southern Pygmy Perch.

Schedule 6 of the *Fisheries Management Act 1994* also lists the following key threatening process that may be relevant to this Proposal and will be addressed within the EIS:

- Degradation of native riparian vegetation along New South Wales water courses;
- Human-caused climate change; and
- Removal of large woody debris from New South Wales rivers and streams.

Any waterway crossings will need to consider an appropriately designed structure that does not obstruct fish passage and will be designed in accordance with the Policy and Guidelines for Fish Habitat Conservation and Management and the Policy and Guidelines for Fish Friendly Waterway Crossings. Notwithstanding this, it is noted that a permit under section 219 would not be required for waterway crossings as Section 5.23 of the EP&A Act excludes SSD projects from requiring "a permit under section 201, 205 or 219 of the Fisheries Management Act 1994".

SEPP (Koala Habitat Protection) 2020

The State Environmental Planning Policy (Koala Habitat Protection) 2021 was made and commenced on 17 March 2021. The Koala SEPP 2021 reinstates the policy framework of SEPP Koala Habitat Protection 2019 to 83 Local Government Areas (LGA) in NSW. This includes Oberon LGA and Koala SEPP 2019 will apply. The project would, as far as practicable, aim to be consistent with the objectives of the Koala Habitat Protection SEPP and will be addressed within any BDAR prepared to support the EIS.

3. METHODOLOGY

This Preliminary Biodiversity Values Assessment aims to identify and describe key biodiversity values within the project boundary and to provide preliminary recommendations in terms of avoidance, mitigation and/or additional assessment required.

3.1 Desktop Review

The desktop review included the following resources:

- ERM (2014a) Paling Yards Wind Farm: Supplementary Ecology Report (SER). Report prepared for Union Fenosa Wind Australia Pty Ltd;
- ERM (2014b) Paling Yards Wind Farm: Response to Submission. Report prepared for Union Fenosa Wind Australia Pty Ltd;
- NSW Threatened Biodiversity Data Collection, including the Wildlife Atlas (BioNET), Vegetation Information System (VIS) database and threatened species profiles. Accessed October 2019;
- Results of the Commonwealth Department of Environment and Energy (DoEE) Protected Matters Search Tool (PMST) identifying threatened species and communities with potential to occur within the locality (10 km buffer around the project boundary). Accessed October 2019;
- NSW SEED mapping to identify Plant Community Types (PCT), threatened species or communities known or likely to occur; Mitchell Landscapes, map of Interim Biographic Regionalisation of Australia (IBRA) version 7;
- Atlas of Living Australia (ALA) Database. Accessed February 2021; and
- Local government databases.

The results of the database searches are included in Appendix A.

3.2 Field Survey

For the purpose of the Preliminary Biodiversity Values assessment, the biodiversity study area targeted during the most recent field survey has been defined as a 100m buffer to all project infrastructure, including access tracks, wind turbines, overhead transmission line, substation and crane hard stands.

The field survey was led by Lizzie Bowman (BAAS 18112) and Bart Schiebaan (BAAS 18033) from Hunter Ecology between 2nd February and 10th February 2021, and was supported in the field by ERM ecologist Lorena Boyle.

The surveys were undertaken to verify and ground truth the findings of the desktop assessment. The survey area is indicated on Figure 3.1 and the surveys included a range of targeted and general survey methods as detailed in Table 3.1

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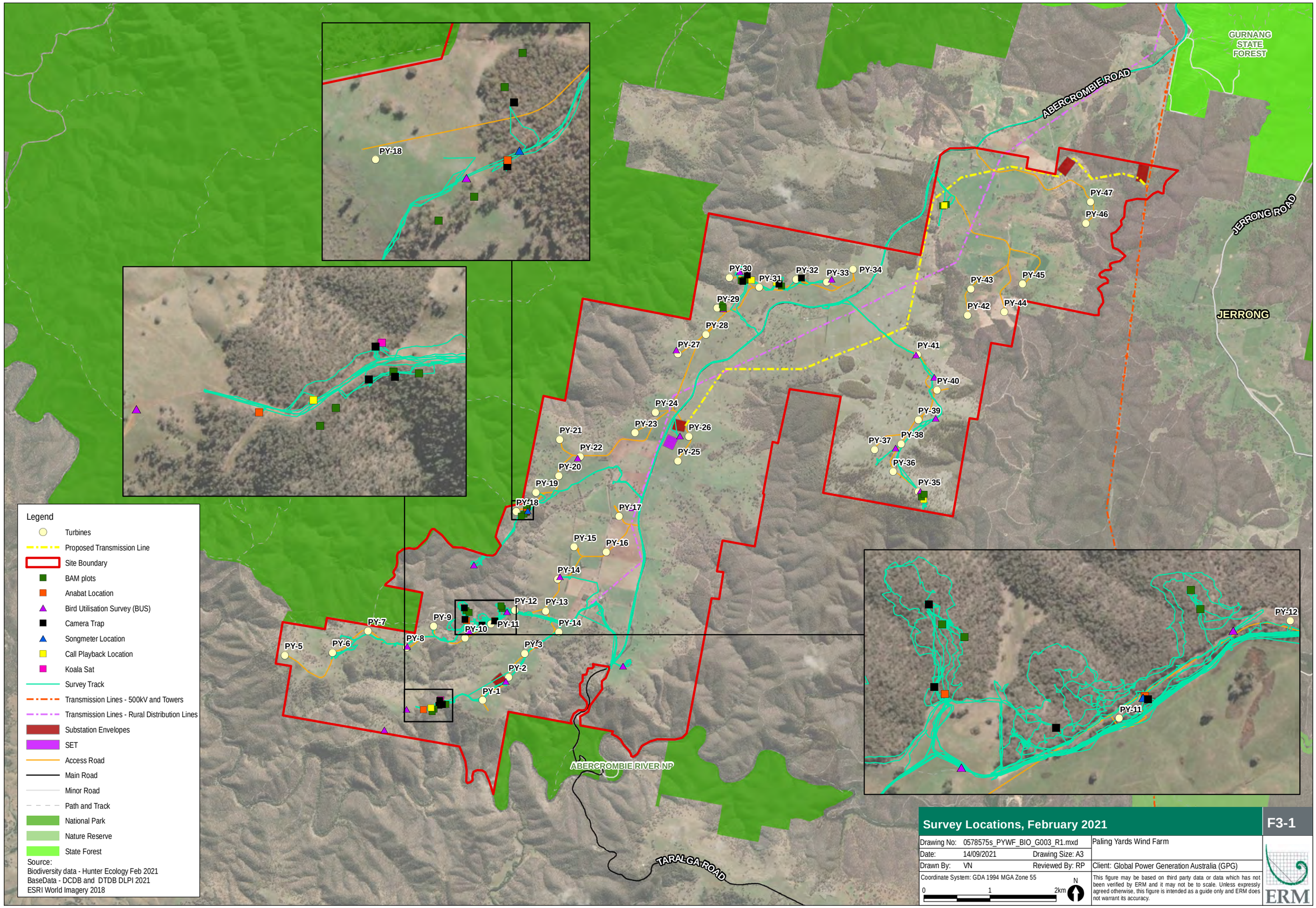

Survey Locations, February 2021

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Drawn By:	VN	Reviewed By: RP	Client: Global Power Generation Australia (GPG)

Coordinate System: GDA 1994 MGA Zone 55

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Table 3.1 Summary of February 2021 Survey Methods

Biodiversity Value	Survey Method	Summary of Survey Effort
Flora	Plot-based Floristic Surveys	A total of 15 plot-based floristic surveys were conducted in accordance with s.5.2.1.9 of the BAM. Survey plots were established around a central 50 m transect and each included: ■ A 20 m x 20 m plot sampled for the presence of flora species. The plots were carefully examined to identify all flora species present. This search continued until it was confident that all flora species within the plots were detected. ■ One 1000 m² (20 m x 50 m) plot to assess the function attributes: number of large trees, stem size class, tree regeneration and length of logs. ■ Five 1 m² sub-plots to assess average litter cover (and other groundcover components).
	Flora Survey and Community Mapping	To further support the plot based surveys, a general flora survey was also carried out in the Project site, using Cropper's (1993) 'random meander' technique. Plant Community Types (PCTs) were identified according to the NSW PCT classification as described in the NSW BioNet Vegetation Information System (BioNet VIS) using a combination of API, a review of regional vegetation mapping and ground-truthing dominant structural / floristic attributes.
Habitat and landscape features	Habitat and landscape assessments	Opportunistically undertaken over the eight day survey period. Key habitat features included relative vegetative cover, abundance of nesting/shelter/basking sites, presence of aquatic habitats, presence of foraging resources, refuge sites, dominant canopy species, connectivity and disturbances.
Birds	Bird Utilisation Surveys	20 Bird Utilisation surveys (20 minutes each) undertaken at similar points to the 2014 surveys to assist in data comparison The methods adopted for the Bird Utilisation Survey (BUS) were consistent with the requirements for a 'Level One' bird risk assessment (AusWEA 2005). This approach has been endorsed in the AusWEA Best Practice Guidelines (2007). The BUS method involved two observers stationed at a fixed survey point for 20 minutes, recording abundance of all large bird species observed within 800m and all small birds within 100m. For each observation, flight height was documented. Flight heights were classified using graded height intervals and later compared against rotor swept area (RSA) height for the proposed wind turbines, and classified as: below RSA height (< 30 m), at RSA height (30 to 250m), or above RSA height (> 250m). When a bird was recorded flying through the range at altering heights which included the RSA height, the bird was listed as being at RSA height.
	Diurnal Surveys	Opportunistically undertaken over the eight day survey period
	Targeted nocturnal surveys	Eight nocturnal surveys over eight separate evenings undertaken using spotlights and call playback. Total 24 person hours. Five-minute listening period, followed by call playback session of five minutes of intermittent calls for each of the targeted species, followed by 20-minute period of listening during which spotlighting was conducted on a 1 ha circular plot (i.e., approx. 57 m radius).

Biodiversity Value	Survey Method	Summary of Survey Effort
	Song meter	Acoustic recordings were taken using two (2) songmeters deployed at two locations within the Project site and were active for seven days and seven nights. The song meters were secured to tree trunks and directed to open space considered likely bird utilisation areas.
Reptile and Amphibian	Diurnal Surveys	Opportunistically undertaken over the seven day survey period.
Mammal	Camera Trapping	Ten camera traps set on site over seven consecutive nights. The camera traps were secured to tree trunks and directed toward bait balls secured to an adjacent tree trunk within a detectable distance (<3 m). The bait balls used were made using honey, oat and peanut butter. Camera traps were deployed in accordance with 'A Guide for the Use of Remote Camera for Wildlife Survey in Northern Australia' (Gillespie et al., 2015).
	Koala SAT Surveys	Fifteen (15) Spot Assessment Technique (SAT) surveys were undertaken across the Project site to survey for evidence of Koala presence/absence. This involved a point-based, tree sampling methodology that utilised the presence/absence of koala faecal pellets at the base of trees within a prescribed search area. Each search area included thirty trees surrounding a central point, with each tree sampled being one of live woody stem (except palms, cycads, tree ferns and grass trees) of minimum 200mm diameter at breadth height (DBH).
	Diurnal Surveys	Opportunistically undertaken over the eight day survey period
	Ultrasonic echolocation call recording	Five anabats set on site for seven consecutive nights. The Anabats were positioned approximately 2 m above ground level, secured to a tree trunk and were directed toward open areas considered likely flight paths for microcheroptera. Anabat surveys were deployed in accordance with 'Survey guidelines for Australia's threatened bats' (Reardon, 2010). **Bat call analysis for the February 2021 survey period is not yet available and has not been included in this scoping report*
	Targeted nocturnal surveys	Seven nocturnal surveys were undertaken using spotlights and call playback. Total 24 person hours. This method included walking through habitat with head torches and hand held spotlights, while looking for eye shine or fauna movement. Call playback was also utilised for targeted species including Squirrel Glider, Eastern Curlew and Koala. These methods are consistent with industry standard guidelines (Eyre et al., 2018).

**It is noted that the survey effort was restricted in some areas due to property access limitations. The northern end of the Transmission Line was not surveyed during February 2021 surveys as ERM were not granted access by the landowner. This area was also not surveyed by ERM in 2014. This area includes sections that are heavily vegetated and connected to the Abercrombie River National Park. The vegetation is likely to include areas of PCT 1093 - Red Stringybark - Brittle Gum - Inland Scribbly Gum Dry Open Forest.*

3.3 Field Survey Conditions

Table 3.2 details the daily weather observations that were recorded for the Taralga Post Office weather station during the field survey, which is approximately 28 kilometres from the project.

The survey effort was paused due to weather conditions on the 7th of February. Temperatures ranged from a minimum of 8.5ºC to a maximum of 27ºC. A total of 55.4mm of rainfall was recorded during the survey period.

Table 3.2 Daily Weather Observations for Taralga Post Office Weather Station

Date	Minimum Temperature (°C)	Maximum Temperature (°C)	Rainfall (mm)
02/02/2021	12	24	31
03/02/2021	11	23	0.2
04/02/2021	12	25.5	0
05/02/2021	16	25.5	3
06/02/2021	18	27	0.2
07/02/2021	10	25.5	21
08/02/2021	11.5	21.5	0
09/02/2021	12.5	Not Available	0
10/02/2021	8.5	22	0

3.4 Likelihood of Occurrence

Consistent with the accepted approach for biodiversity assessment, a preliminary likelihood of occurrence assessment was undertaken, informed by desktop sources and the field survey results. Desktop sources identified a number of fauna and flora species listed under the EPBC Act and BC Act that have been recorded previously or are predicted to occur within a 10 kilometre buffer of the project boundary. The likelihood of occurrence approach refines the desktop generated list using site-specific and specific-species habitat information.

Desktop sources are indicative only and likelihood rankings, particularly in regard to the presence of preferred habitat, are conservative. The assessment ranks the likelihood of the species occurring within the project boundary through analysis of species distribution information and the presence of specific habitat attributes as identified through the desktop analysis and field survey.

The criteria applied are outlined in Table 3.3 . The preliminary likelihood of occurrence assessment is provided in Appendix C of this report.

Table 3.3 Likelihood of Occurrence Criteria

Factor	Preferred habitat exists	Suitable habitat exists[1]	Habitat does not exist[2]
Records within project boundary	Known	Known	Known
Records in the locality[3]	Likely	Potential	Unlikely
No records in the locality, but project boundary is within known distribution	Potential	Unlikely	Unlikely
No records in the locality, and Investigation Area is outside of distribution	Unlikely	Unlikely	Unlikely

1-Habitat may be considered suitable, but not preferred.
2-Based on sources reviewed and/or field survey results.
3-'Locality' refers to a 10 km buffer of the project boundary.

3.5 Assumptions and Limitations

The field and desktop assessments provide an overview of the biodiversity values that exist within the project boundary. Surveys were undertaken at discrete locations based on the proposed infrastructure footprint (e.g. turbine and road locations) to gain a general understanding of the types of species and habitat features that occur. Not all portions within the project boundary could be visited during the field survey, including the northern portion of the site, which was not surveyed by ERM in either 2014 or 2021. This area is contains heavily vegetated patches and may provide important habitat for both flora and fauna.

The absence of a species from a database list or observational studies does not confirm its absence within the project boundary. The lack of existing records from databases is more likely to indicate a low historic sampling effort in the region, as opposed to an absence of species. Similarly, the timing of the survey precludes the detection of a number of migratory and wader species that are typically absent from the area at that time of the year. Future biodiversity surveys in late 2021 will aim to address temporal variability with a particular focus on migratory species.

To overcome these limitations, the likelihood of occurrence is based on the precautionary approach and identifies species that have the potential to occur rather than relying on species sightings alone.

4. BIODIVERSITY VALUES

This chapter summarises the results of the field investigations used to understand and assess the potential biodiversity values present within the project boundary. Key landscape features and a summary biodiversity values within the Project site are summarised in Table 4.1 .

Table 4.1 Summary of Landscape Features and Biodiversity Values

Landscape feature	Summary notes
IBRA Bioregion IBRA Sub-region	South Eastern Highlands (SEH) Bioregion Crookwell (SEH 9) sub-region
Landuse and history of disturbance	Areas within the project boundary have been subject to extensive clearing and are now regularly grazed by livestock for agricultural industries including wool, lamb and beef cattle. However, there are vegetation patches scattered within the project boundary that maintain connectivity to the surrounding bushland including the Abercrombie Rivers National Park. These include large intact patches, and many medium to small vegetation patches and tree lines.
Vegetation	The Biodiversity Study Area was characterised by a mix of improved pasture, small remnant patches of woodland and large intact areas of open forest that connect to the adjacent Abercrombie River National Park. Based on the results of the February 2021 field survey, five Plant Community Types (PCT) have been recorded within the Biodiversity Study Area.

Plant Community Types	Area (ha)
PCT 1093 Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion	25.17
PCT 649 Apple Box - Broad-leaved Peppermint dry open forest of the South Eastern Highlands Bioregion	15.81
PCT 654 Apple Box - Yellow Box dry grassy woodland of the South Eastern Highlands Bioregion	12.84
PCT 731 Broad-leaved Peppermint - Red Stringybark grassy open forest on undulating hills, South Eastern Highlands Bioregion	8.20
PCT 951 Mountain Gum - Manna Gum open forest of the South Eastern Highlands Bioregion	3.69

Of these vegetation communities, only PCT 654 has association with the BC Act listed White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland TEC.

Further assessment and analysis within the EIS will confirm if this PCT within the Biodiversity Study Area is also consistent with the EPBC Act listed White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland TEC.

Threatened species	Threatened species recorded during previous surveys (ERM 2014): ■ Scarlet Robin (*Petroica boodang*) - BC Act Vulnerable ■ Flame Robin (*Petroica phoenicea*) - BC Act Vulnerable ■ Eastern False Pipistrelle (*Falsistrellus tasmaniensis*) - BC Act Vulnerable (possible record) ■ Greater Broad-nosed Bat (*Scoteanax rueppellii*) - BC Act Vulnerable (possible record) ■ Large Bent-wing Bat (*Miniopterus orianae oceanensis*) - BC Act Vulnerable (possible record) Threatened species recorded in February 2021: ■ Gang-gang Cockatoo (*Callocephalon fimbriatum*) – BC Act Vulnerable **Bat call analysis for the February 2021 survey period is not yet available and has not been included in this scoping report.*

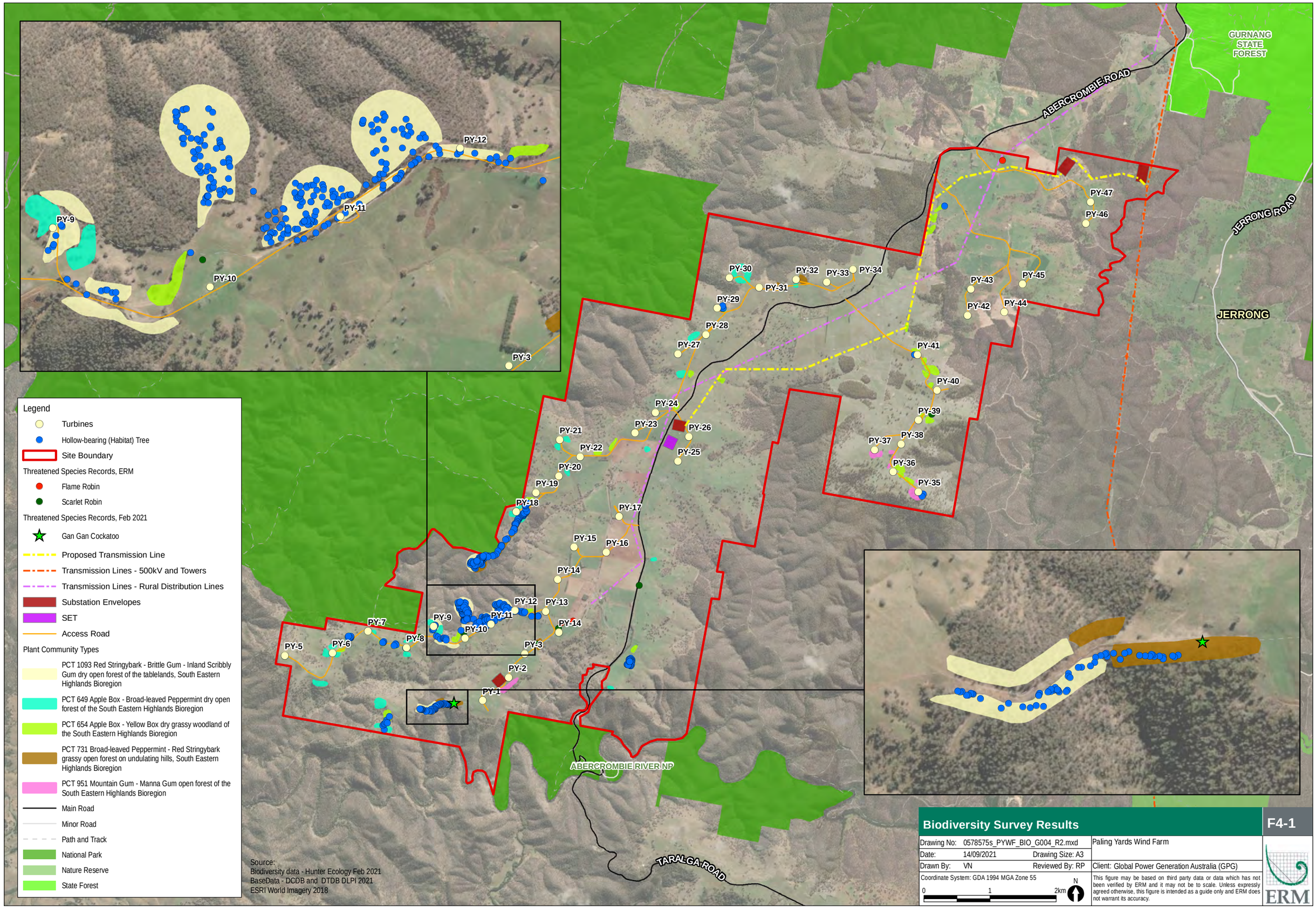
Landscape feature	Summary notes
Areas of Geological Significance	There are no karst, caves, crevices, cliffs or other areas of geological significance within the Proposal site.
Areas of Outstanding Biodiversity Value (AOBV)	There are no Areas of Outstanding Biodiversity Value (AOBV) within the Proposal site.
Aquatic habitat	In accordance with NSW Hydrography, the proposed turbine locations do no intercept any mapped watercourse, although some turbines are in close proximity to drainage features (<100 m). Farm dams are common across the agricultural landscape. It is also noted that Abercrombie River forms part of the southern boundary of the Project site and Oakey Creek the western boundary. Black Bett Creek and Paling Yard Creek also run through the centre of the Project Site. Indirect impacts and sensitive creek crossing designs will be considered as part of the EIS
Hollows and Hollow Bearing Trees	Hollow bearing trees were identified within the Biodiversity Study Area and will be mapped and classified to inform the EIS. During the field surveys, ecologists aimed to identify habitat and landscape features important for threatened and migratory fauna species. The locations of large hollows (> 20 centimetre diameter), den habitat and rocky outcrops were recorded. Woody debris was abundant throughout, which may be attributable to recent and ongoing agricultural use of the land.

4.1 Vegetation Communities

The majority of areas within the project boundary are characterised by non-native grasslands resulting from vegetation clearing and livestock grazing. A variety of Eucalyptus woodland and forest communities exist as tree lines and small, moderate and large patches. These communities are the dominant native extant vegetation communities in the project boundary. Paddock trees (Eucalyptus spp.) are common throughout the non-native grasslands.

Vegetation communities within the biodiversity survey area are outlined in Table 4.2 and Figure 4.1.

A total of 81 flora species were identified during the BAM plot surveys, with 53 being considered native species. 28 species identified are exotic, including six species identified as weeds of national significance. A full list of species recorded during the field surveys is provided in Appendix A of this report. High threat exotic and Weeds of National Significance are provided in Table 4.3.


GURNANG STATE FOREST
ABERCROMBIE ROAD
JERRONG ROAD
JERRONG
ABERCROMBIE RIVER NP
TARALGA ROAD
PY-1
PY-2
PY-3
PY-5
PY-6
PY-7
PY-8
PY-9
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PY-38
PY-39
PY-40
PY-41
PY-42
PY-43
PY-44
PY-45
PY-46
PY-47
Legend
Turbines
Hollow-bearing (Habitat) Tree
Site Boundary
Threatened Species Records, ERM
Flame Robin
Scarlet Robin
Threatened Species Records, Feb 2021
Gan Gan Cockatoo
Proposed Transmission Line
Transmission Lines - 500kV and Towers
Transmission Lines - Rural Distribution Lines
Substation Envelopes
SET
Access Road
Plant Community Types
PCT 1093 Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
PCT 649 Apple Box - Broad-leaved Peppermint dry open forest of the South Eastern Highlands Bioregion
PCT 654 Apple Box - Yellow Box dry grassy woodland of the South Eastern Highlands Bioregion
PCT 731 Broad-leaved Peppermint - Red Stringybark grassy open forest on undulating hills, South Eastern Highlands Bioregion
PCT 951 Mountain Gum - Manna Gum open forest of the South Eastern Highlands Bioregion
Main Road
Minor Road
Path and Track
National Park
Nature Reserve
State Forest
Source:
Biodiversity data - Hunter Ecology Feb 2021
BaseData - DCDB and DTDB DLPI 2021
ESRI World Imagery 2018
Biodiversity Survey Results
F4-1
Drawing No: 0578575s_PYWF_BIO_G004_R2.mxd
Paling Yards Wind Farm
Date: 14/09/2021
Drawing Size: A3
Drawn By: VN
Reviewed By: RP
Client: Global Power Generation Australia (GPG)
Coordinate System: GDA 1994 MGA Zone 55
0
1
2km
N
This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.
ERM

Table 4.2 Plant Community Types recorded during February 2021 Field Surveys

Plant Community Type Number	Plant Community Type	Area (ha)
PCT 1093	Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion	25.17
PCT 649	Apple Box - Broad-leaved Peppermint dry open forest of the South Eastern Highlands Bioregion	15.81
PCT 654	Apple Box - Yellow Box dry grassy woodland of the South Eastern Highlands Bioregion	12.84
PCT 731	Broad-leaved Peppermint - Red Stringybark grassy open forest on undulating hills, South Eastern Highlands Bioregion	8.20
PCT 951	Mountain Gum - Manna Gum open forest of the South Eastern Highlands Bioregion	3.69

Table 4.3 High Threat Exotic Species Recorded within the Biodiversity Survey Area

Scientific name	Common name	Weed of National Significance	NSW Noxious Weed
Rubus fruticosus	Blackberry	Yes	Yes
Carthamus lanatus	Woolly Distaff Thistle	No	Yes
Lycium ferocissimum	African Boxthorn	Yes	Yes
Nassella trichotoma	Serrated Tussock	Yes	Yes
Carduus nutans subsp. nutans	Nodding Thistle	No	Yes

4.2 Threatened Ecological Communities

Of the five vegetation communities identified within the biodiversity survey area, only PCT 654 has association with the BC Act listed White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland TEC. Confirmation of the status of this community within the project boundary will be provided in the EIS and BDAR.

BC Act listed White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland TEC

This BC Act listed ecological community was listed as a Critically Endangered Ecological Community (CEEC) on July 17, 2020. It is characterised by the presence or prior occurrence of White Box, Yellow Box and/or Blakely's Red Gum and a generally grassy understorey. Intact stands that contain diverse upper and mid-storeys and groundlayers are rare. Modified sites include the following:

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

EPBC Act listed White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland TEC

Further assessment and analysis within the EIS and BDAR will confirm if PCT 654 within the project boundary is also consistent with the EPBC Act listed White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland TEC. The EPBC listed ecological community is characterised by a species-rich understorey of native tussock grasses, herbs and scattered shrubs (where shrub cover comprises less than 30% cover), and a dominance or prior dominance of White Box (*Eucalyptus albens*) and/or Yellow Box (*E. melliodora*) and/or Blakely's Red Gum (*E. blakelyi*) trees.

To be considered part of the EPBC listed ecological community remnant areas must also:

- have a predominantly native understorey (i.e. more than 50% of the perennial vegetative groundlayer must comprise native species), and
- be 0.1 hectare (ha) or greater in size and contain 12 or more native understorey species (excluding grasses), including one or more identified important species; or
- be 2 ha or greater in size and have either natural regeneration of the overstorey species or an average of 20 or more mature trees per ha.

4.3 Threatened Flora

No threatened flora species have been identified within the biodiversity survey area during the various surveys between 2013 and 2021.

4.4 Threatened Fauna

A total 49 bird species, 14 mammal species, five (5) amphibian species and six (6) reptile species were recorded during the Summer Surveys (February 2021) and are listed in Appendix B.

Threatened species that are known or considered likely to occur within the project boundary are detailed in Table 4.4 and described below.

Microchiropteran Bats

Previous surveys undertaken across the Project site and reported by ERM (2014) identified (via 'possible' calls only) three threatened microchiropteran bats listed as Vulnerable under the BC Act; the Eastern False Pipistrelle, the Large Bent-wing Bat and the Greater Broad-nosed Bat. These threatened species may be susceptible to rotor strike and barotrauma. In particular, the Eastern False Pipistrelle and the Large Bent-wing Bat may forage near the rotor sweep area.

The Large Bent-wing Bat migrates annually to maternity caves, where the females breed and hibernate. Males remain dispersed throughout suitable habitat, and females emerge following the breeding period, to disperse across the landscape. The Project site is within 150km of two known maternity caves, Wee Jasper 140 km to the south west and Bungonia 85 km to the south east (Dwyer & Hamilton-Smith 1965; OEH 2021). The Eastern False Pipistrelle and the Greater Broad-nosed Bat roost mainly in tree hollows. The proportion of bats that would be at risk of rotor collision impacts in the Project site is expected to be relatively low as the species recorded are likely to be dispersed over a wide area, although this will be addressed within the EIS. Microchiropteran bats may be at risk of mortality due to the effects of barotrauma and will be addressed within the EIS.

Woodland Birds

Both the Scarlet and Flame Robins are known to occupy more open habitats in winter including pasture and their prevalence within the Project site is likely to occur on a seasonal basis, with woodland and forested areas likely to be occupied during the breeding season (ERM 2014). Potential impacts to these species such as habitat fragmentation and displacement will be addressed within the EIS. Neither of these species would be at risk of turbine strike.

Gang-Gang Cockatoo was recorded within the Project site during the most recent February 2021 survey. In spring and summer, this species is generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In autumn and winter, they often move 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 (DPIE online Threatened Species Profile, OEH 2021b). Potential impacts to this species such as habitat fragmentation and displacement will be addressed within the EIS. The Gang-gang Cockatoo is unlikely to be at risk of turbine strike.

Table 4.4 Threatened and Migratory Species Likely or Known to Occur within the Project Site

Scientific Name	Common Name	BC Act	EPBC Act	Likelihood of occurrence	Vulnerability to impact
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V	-	Likely	■ Loss of native vegetation ■ Habitat fragmentation and isolation of patches of remnant woodland and open forest
Callocephalon fimbriatum	Gang-gang Cockatoo	V	-	Known[1]	■ Loss of native vegetation ■ Mortality and injury from turbine strike
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	V	-	Likely	■ Loss of native vegetation ■ Fragmentation of native habitat ■ Loss of understory, hollow bearing trees, and ground litter
Daphoenositta chrysoptera	Varied Sittella	V	-	Likely	■ Loss of native vegetation ■ Increased habitat fragmentation ■ Mortality and injury from vehicle strikes and vegetation clearing ■ Noise, light and vibration impacts ■ Edge effects
Eucalyptus aggregata	Black Gum	V	V	Likely	■ Clearing ■ Lack of recruitment
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V	-	Likely	■ Loss of native vegetation ■ Increased habitat fragmentation ■ Mortality and injury from turbine strikes ■ Mortality and injury from vehicle strikes and vegetation clearing
Glossopsitta pusilla	Little Lorikeet	V	-	Likely	■ Loss of native vegetation ■ Loss of old hollow bearing trees
Hieraaetus morphnoide	Little Eagle	V	-	Likely	■ Loss of native vegetation ■ Increased habitat fragmentation ■ Mortality and injury from turbine strikes ■ Mortality and injury from vehicle strikes and vegetation clearing
Hirundapus caudacutus	White-throated Needletail	-	V,Mi	Likely	■ Habitat loss ■ Mortality and injury from turbine strikes

Scientific Name	Common Name	BC Act	EPBC Act	Likelihood of occurrence	Vulnerability to impact
Miniopterus orianae oceanensis	Large Bent-winged Bat	V	-	Likely	■ Loss of native habitat ■ Mortality and injury from turbine strikes ■ Mortality and injury from vehicles strikes
Ninox strenua	Powerful Owl	V	-	Likely	■ Loss of native vegetation ■ Increased habitat fragmentation ■ Mortality and injury from vehicle strikes and vegetation clearing ■ Noise, light and vibration impacts ■ Edge effects
Petrocia phoenicea	Flame Robin	V	-	Known[1]	■ Loss of native vegetation ■ Increased habitat fragmentation ■ Mortality and injury from vehicle strikes and vegetation clearing ■ Noise, light and vibration impacts ■ Edge effects
Petroica boodang	Scarlet Robin	V	-	Known[1]	■ Loss of native vegetation ■ Increased habitat fragmentation ■ Mortality and injury from vehicle strikes and vegetation clearing ■ Noise, light and vibration impacts ■ Edge effects
Phascolarctos cinereus	Koala	V	V	Likely	■ Loss of native vegetation ■ Increased habitat fragmentation ■ Mortality and injury from vehicle strikes and vegetation clearing ■ Edge effects
Scoteanas rueppellii	Greater Broad-nosed Bat	V	-	Likely	■ Disturbance to roosting sites and loss of breeding site (hollow bearing trees) ■ Loss of native vegetation for foraging habitat
Varanus rosenbergi	Rosenberg's Goanna	V	-	Likely	■ Loss of native vegetation ■ Habitat fragmentation ■ Removal of habitat features such as fallen timber ■ Mortality and injury from turbine strikes

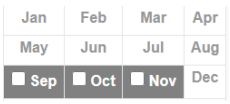
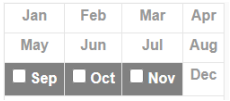
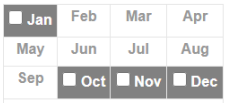
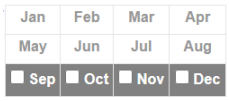
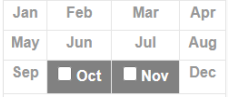
4.5 Candidate Species

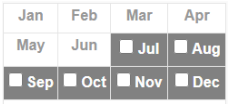
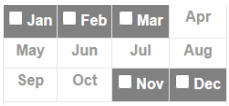
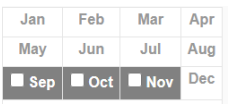
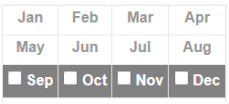
In accordance with the requirements of Section 5.2 of the BAM, the BDAR will identify the habitat suitability for threatened species within the project boundary (refer to Appendix C for a preliminary likelihood of occurrence). Species that meet all the relevant criteria will be automatically populated in the BAM-C to be assessed either for ecosystem credits or species credits. No further assessment is required for those species that are unlikely to occur or where the project site is considered as unsuitable habitat.

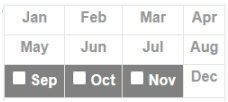
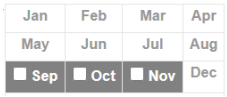
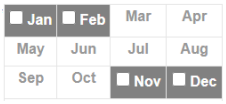
- **ecosystem credit species** are considered likely to have suitable habitat on the subject land and must be assessed for impacts, including measures taken to avoid, minimise and mitigate impacts. These species are referred to as 'predicted species' in the BAM-C and the assessor must calculate ecosystem credits to offset any residual impacts
- **species credit species** are likely to have suitable habitat on the subject land. They are referred to as 'candidate species' in the BAM-C and will require further assessment.

A preliminary list of candidate species and their seasonal survey requirements is provided in Table 4.5.

Table 4.5 Preliminary List of Candidate Species that will require assessment under the BAM

Scientific Name	Common Name	Survey Months
Ammobium craspedioides	Yass Daisy	
Anthochaera phrygia	Regent Honeyeater (breeding)	
Aprasia parapulchella	Pink-tailed Legless Lizard	
Caladenia tessellata	Thick Lip Spider Orchid	
Callocephalon fimbriatum	Gang-gang Cockatoo (breeding)	
Calyptorhynchus lathami	*Glossy Black-Cockatoo (Breeding)*	
Cercartetus nanus	Eastern Pygmy-possum	
Delma impar	*Striped Legless Lizard*	
Diuris aequalis	*Buttercup Doubletail*	
Eucalyptus pulverulenta	*Silver-leafed Gum*	
Eucalyptus robertsonii subsp. hemisphaerica	Robertson's Peppermint	

Scientific Name	Common Name	Survey Months
Haliaeetus leucogaster	White-bellied Sea-Eagle (breeding)	
Hieraaetus morphnoides	Little Eagle (breeding)	
Lepidium hyssopifolium	Aromatic Peppercress	
Litoria aurea	Green and Golden Bell Frog	
Litoria booroolongensis	Booroolong Frog	
Litoria castanea	Yellow-spotted Tree Frog	
Miniopterus orianae oceanensis	Large Bent-winged Bat (breeding)	
Myotis macropus	*Southern Myotis*	
Ninox connivens	*Barking Owl (breeding)*	
Ninox strenua	Powerful Owl (breeding)	
Phascolarctos cinereus	Koala (breeding)	
Petaurus norfolcensis	Squirrel Glider	
Polytelis swainsonii	Superb Parrot (breeding)	
Prasophyllum petilum	*Tarengo Leek Orchid*	

Scientific Name	Common Name	Survey Months
Pteropus poliocephalus	Grey-headed Flying-fox (breeding)	
Swainsona recta	*Small Purple-pea*	
Swainsona sericea	*Silky Swainson-pea*	
Synemon plana	*Golden Sun Moth*	
Thesium australe	*Austral Toadflax*	
Tympanocryptis pinguicolla	*Grassland Earless Dragon*	

4.6 Preliminary Bird Utilisation Results

Prescribed impacts related to wind farm development apply not only to threatened species but also any resident raptor species and nomadic or migratory species whose flight paths are likely to cross the subject land (Paragraph 6.7.1.5 of the BAM).

During the field surveys, 123 birds were recorded from 20 surveys. There were 19 bird species identified with the most abundant being the Australian Magpie, Sulphur-crested Cockatoo and Wedge-tailed Eagle. The majority of birds were observed flying short distances between trees.

Seven (7) species were observed to utilise the rotor sweep height (RSH) of between 30 to 250 m. All species are native, with zero (0) being considered threatened within NSW, or under the EPBC Act. These species were:

- Wedge-tailed Eagle (*Aquila audax*)
- Sulphur-crested Cockatoo (*Cacatua galerita*)
- Australian Kestrel (*Falco cenchroides*)
- Fairy Martin (*Petrochelidon ariel*)
- Galah (*Eolophus roseicapilla*)
- Australian Hobby (*Falco longipennis*)
- Australian Magpie (*Cracticus tibicen*)

Operational wind farms pose a collision risk to birds and bats where rotor strike can cause injury or death. Fatalities and injuries are usually caused by a collision with the moving blades (blade strike), or with the turbine infrastructure. The EIS and BDAR will assess potential collision risks to both birds and bats.

5. MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

Based on the results of the desktop assessment and the field surveys undertaken between 2013 and 2021, a preliminary assessment of Matters of National Environmental Significance (MNES) within the Project site has been provided in Table 5.1.

Table 5.1 Preliminary assessment of Matters of National Environmental Significance (MNES)

MNES	Relevance to the Project Boundary
World Heritage Properties	The northern portion of the Project is located approximately 2km west of the Greater Blue Mountains Area. The Greater Blue Mountains World Heritage Area was inscribed on the World Heritage List in 2000. It is 1 million hectares (10,000 km^2) of national park and wilderness dominated by temperate eucalypt forest. The area supports exceptional biodiversity including a number of rare plants. It's also highly valued for its Aboriginal heritage and its outstanding geological features. The EIS will assess indirect and cumulative impacts to the world heritage area.
National heritage properties	
Wetlands of international importance	There are no wetlands of international importance within the Project site. The closest records (as identified within the Protected Matters Search Tool (PMST)) are: ■ Banrock station wetland ■ Hattah-kulkyne Lakes ■ Riverland ■ The Coorong, and Lakes Alexandrina and Albert Wetland
Threatened species and ecological communities	No EPBC listed threatened species have been recorded within the Project site. Further assessment and analysis within the BDAR will confirm if this PCT 654 within the Project Site is also consistent with the EPBC Act listed White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland TEC.
Migratory species	Known to occur: ■ No migratory species have been recorded within the Project site. Likely to occur: ■ Fork-tailed swift (*Apus pacificus*) ■ White-throated Needletail (*Hirundapus caudacutus*) ■ Black-faced Monarch (*Monarcha melanopsis*) ■ Yellow Wagtail (*Motacilla flava*) ■ Satin Flycatcher (*Myiagra cyanoleuca*) ■ Rufous Fantail (*Rhipidura rufifrons*)
Commonwealth marine area	Not identified within the project boundary or within 50 km radius
The Great Barrier Reef Marine Park	Not identified within the project boundary or within 50 km radius
Nuclear actions	Not Applicable
Water resources	Abercrombie River

A referral for a windfarm development across the Project site was submitted to the Federal Department of Environment and Heritage in February 2005. In March 2005, the Minister declared that the action is not a controlled action and approval under Part 9 of the EPBC Act was not required (EPBC Reference 2005/2018).

The ecological desktop and field studies undertaken to date have not revealed any additional MNES that would require further assessment under the EPBC Act. The need for the Project to be referred to the Australian Government Minister for the Environment will be confirmed following additional seasonal survey and assessment.

Further assessment and analysis within the BDAR will also confirm if the patches of PCT 654 within the project boundary are consistent with the EPBC Act listed White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland TEC. The EPBC listing has specific condition criteria that will need to be assessed, specifically if these patches have >50% native ground cover.

6. PRELIMINARY IMPACT ASSESSMENT

The construction and operation of the Project has the potential to cause impacts to threatened species and TECs listed under the BC Act, and these will need to be considered as part of the EIS to be prepared under Part 5 of the NSW EP&A Act. As there are recorded Biodiversity values within the Project site, application of the BAM and the preparation of a BDAR will be required.

Candidate species will be selected for further assessment by considering how they and their habitat might be affected by the project. A preliminary list has been presented in Table 4.5. In this instance the main potential impacts of the project (during construction and operation) that would need to be assessed include:

- Clearing of TECs;
- Loss of extant native vegetation communities and associated fauna habitat and the subsequent impacts to local population of native species, particularly threatened and migratory species;
- Increased habitat fragmentation;
- Mortality and injury of avian and microchiropteran species from turbine strike;
- Mortality and injury from vehicle strikes and vegetation clearing; and
- Mortality and injury from baratrauma.

Mitigation measures relevant to threatened species, TECs, native vegetation communities, species vulnerable to turbine strikes, hydrology and construction impacts will be addressed within the EIS. There is also a risk that weeds may be transported within and off-site. Mitigation measures to reduce the chance of the spread of weeds will be considered within the EIS.

6.1 Recommendations and Next Steps

The desktop assessment and field surveys undertaken to date have highlighted a range of known and potential biodiversity constraints. To effectively avoid and minimise impacts associated with the project, the following management recommendations are suggested:

- Commit to a nil net loss of TECs within the project boundary;
- Minimise loss of existing native vegetation; and
- Aim to minimise habitat loss for threatened species within the project boundary.

The following steps are considered essential in ensuring an adequate assessment of biodiversity values is continued throughout future stages of the project:

- Prepare and submit a BDAR in accordance with the BAM;
- Prepare a detailed assessment of MNES;
- Conduct detailed habitat mapping and native vegetation mapping for all direct impact areas (e.g. the development footprint); and
- Conduct further targeted seasonal fauna and flora surveys in October 2021 for species considered likely or potentially occurring within the project boundary in accordance with relevant federal or State survey guidelines.

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APPENDIX A FLORA AND FAUNA SPECIES OBSERVED, FEBRUARY 2021

FAUNA SPECIES OBSERVED DURING FIELD SURVEYS, FEBRUARY 2021

Scientific Name	Common Name	EPBC Act	BC Act
Birds			
Gerygone olivacea	White-throated Gerygone	-	-
Acanthiza chrysorrhoa	Yellow-rumped Thornbill	-	-
Aquila audux	Wedge-tailed Eagle	-	-
Aegotheles cristatus	Owlet Nightjar	-	-
Dacelo novaeguineae	Laughing Kookaburra	-	-
Egretta novaehollandiae	White-faced Heron	-	-
Chenonetta jubata	Australian Wood Duck	-	-
Anus castanae	Chestnut Teal	-	-
Anas superciliosa	Pacific Black Duck	-	-
Cracticus torquatus	Grey Butcherbird	-	-
Cracticus tibicen	Australian Magpie	-	-
Strepera graculina	Pied Currawong	-	-
Callocephalon fimbriatum	Gang-gang Cockatoo	-	V
Zanda funerea	Yellow-tailed Black Cockatoo	-	-
Cacatua galerita	Sulphur-crested Cockatoo	-	-
Eolophus roseicapilla	Galah	-	-
Coracina novaehollandiae	Black-faced Cuckoo-shrike	-	-
Vanellus miles	Masked Lapwing	-	-
Cormobates leucophaea	White-throated Treecreeper	-	-
Ocyphaps lophotes	Crested Pigeon	-	-
Phaps chalcoptera	Common Bronzewing	-	-
Corcorax melanorhamphos	White-winged Chough	-	-
Corvus coronoides	Australian Raven	-	-
Neochmia temporalis	Red-browed Finch	-	-
Falco cenchroides	Australian Kestrel	-	-
Falco longipennis	Australian Hobby	-	-
Falco berigora	Brown Falcon	-	-
*Carduelis carduelis**	European Goldfinch*	-	-
Malurus cyaneus	Superb Fairy-wren	-	-
Anthochaera carunculata	Red Wattlebird	-	-
Manorina melanocephala	Noisy Miner	-	-
Nesoptilotis leucotis	White-eared Honeyeater	-	-
Caligavis chrysops	Yellow-faced Honeyeater	-	-
Grallina cyanoleuca	Magpie-lark	-	-
Anthus novaeseelandiae	Australasian Pipit	-	-
Dicaeum hirundinaceum	Mistletoebird	-	-

Scientific Name	Common Name	EPBC Act	BC Act
Pachycephala rufiventris	Rufous Whistler	-	-
Pardalotus striatus	Striated pardalote	-	-
Pardalotus punctatus	Spotted pardalote	-	-
Eopsaltria australis	Eastern Yellow Robin	-	-
Platycercus eximius	Eastern Rosella	-	-
Platycerus elegans	Crimson Rosella	-	-
Alisterus scapularis	King Parrot	-	-
Gallinula tenebrosa	Dusky Moorhen	-	-
*Fulica atra**	Eurasian Coot*	-	-
Rhipidura albiscapa	Grey Fantail	-	-
Rhipidura leucophrys	Willie Wagtail	-	-
Ninox boobook	Boobook Owl	-	-
Zosterops lateralis	Silvereye	-	-
Mammals			
*Ovis aries**	Sheep*	-	-
*Canis familiaris**	Dog*	-	-
*Vulpes vulpes**	Fox	-	-
*Dama Dama**	Fallow Deer*	-	-
Sminthopsis murina	Common Dunnart	-	-
*Lepus europaeus**	Hare*	-	-
*Oryctolagus cuniculus**	Rabbit*	-	-
Macropus giganteus	Eastern Grey Kangaroo	-	-
Macropus rufogriseus	Red-Necked Wallaby	-	-
Wallabia bicolor	Swamp Wallaby	-	-
*Mus musculus **	House Mouse*	-	-
*Rattus rattus**	Black Rat*	-	-
Trichosurus vulpecula	Brush-tailed Possum	-	-
Vombatus ursinus	Wombat	-	-
Amphibians			
Litoria peronii	Emerald-spotted Tree Frog	-	-
Litoria revelata	Whirring Tree Frog	-	-
Crinia signifera	Common Eastern Toadlet	-	-
Limnodynastes peronii	Striped Marsh Frog	-	-
Limnodynastes tasmaniensis	Spotted Marsh Frog	-	-
Reptiles			
Intellagama lesueurii	Eastern Water Dragon	-	-
Pseudechis porphyriacus	Red Bellied Black Snake	-	-
Pseudonaja textilis	Eastern Brown Snake	-	-

Scientific Name	Common Name	EPBC Act	BC Act
Egernia cunninghami	Cunningham's Skink	-	-
Lampropholis guichenoti	Common Garden Skink	-	-
Varanus varius	Lace Monitor	-	-

*Note: * denotes non-native species*
Excludes the results of the anabat analysis

FLORA SPECIES OBSERVED DURING FIELD SURVEYS, FEBRUARY 2021

Scientific name	Common name	EPBC Act	BC Act
Eucalyptus viminalis	Manna Gum	-	-
Joycea pallida/ Rytidosperma pallidum	Red-anther Wallaby Grass	-	-
Acacia dealbata	Silver Wattle	-	-
Euchiton sphaericus	Star Cudweed	-	-
Aristida ramosa	Purple Wiregrass	-	-
Themeda triandra	Kangaroo Grass	-	-
Rytidosperma setaceum	Small-flowered Wallaby-grass	-	-
Eucalyptus bridgesiana	Apple Box	-	-
Acacia falciformis	Broad-leaved Hickory	-	-
Bothriochloa macra	Red-leg Grass	-	-
Oxalis perennans	Grassland Wood-sorrel	-	-
Wahlenbergia stricta	Tall bluebell	-	-
Geranium solander	Native Geranium	-	-
Rumex brownii	Swamp Dock	-	-
Lomandra longifolia	Spiny-head Mat-rush	-	-
Elymas scaber	Common Wheat-grass	-	-
Gonocarpus tetragynus	Common Raspwort	-	-
Acaena ovina	Australian Sheep's Burr	-	-
Acaena echinata	Sheep's Burr	-	-
Microlaena stipoides	Weeping Grass	-	-
Acacia gunnii	Ploughshare Wattle	-	-
Oxalis spp.	-	-	-
Geranium solandri	-	-	-
Dichondra repens	Kidney Weed	-	-
Rytidosperma monticola	Wallaby Grass	-	-
Eucalyptus rossi	Inland Scribbly Gum	-	-
Desmodium sp.	-	-	-

Scientific name	Common name	EPBC Act	BC Act
Eucalyptus dives	Broad-leaved Peppermint	-	-
Eucalyptus macrorhyncha	Red Stringybark	-	-
Eucalyptus goniocalyx	Long-leaved Box	-	-
Eucalyptus mannifera	Brittle Gum	-	-
Poa sieberiana	Grey Tussock-grass	-	-
Prostanthera sp.	-	-	-
Lomandra filiformis	Wattle Mat Rush	-	-
Panicum effusum	Hairy Panic	-	-
Hardenbergia	-	-	-
Convolvulus rubescens	Blushing Bindweed	-	-
Acacia brownii	Heath Wattle	-	-
Poranthera microphylla	Small Poranthera	-	-
Echinopogon ovatus	Forest Hedgehog Grass	-	-
Lomandra sp.	-	-	-
Einadia nutans	Nodding Saltbush	-	-
Bursaria spinosa	Native Blackthorn	-	-
Hibbertia obtusifolia	Hoary Guinea-flower	-	-
Styphandra glauca	Nodding Blue Lily	-	-
Senecio prenanthoides	Fireweed	-	-
Hardenbergia violaceae	Purple Coral Pea	-	-
Goodenia hederacea	Ivy Goodenia	-	-
Echinopogon caespitosus	Bushy Hedgehog-grass	-	-
Echinopogon	-	-	-
Cassinia longifolia	Cauliflower Bush	-	-
Scleranthus biflorus	Cushion Bush	-	-
*Rubus fruticosus**	Blackberry		
*Taraxacum officinale**	Common Dandelion	-	-
*Holcus lanatus**	Yorkshire Fog	-	-
*Modiola caroliniana**	Red-flowered Mallow	-	-
*Rosa canina**	Dog Rose	-	-
*Cirsium vulgare**	Spear Thistle	-	-
*Carthamus lanatus**	Saffron Thistle	-	-
*Malva parviflora**	Mallow	-	-
*Solanum nigrum**	Blackberry Nightshade	-	-
*Gamochaeta calviceps**	Cudweed	-	-
*Lycium ferocissimum**	African Boxthorn	-	-

Scientific name	Common name	EPBC Act	BC Act
*Urtica dioica**	Common Nettle	-	-
*Nassella trichotoma**	Serrated tussock	-	-
*Lolium perenne**	Perennial Ryegras	-	-
*Trifolium repens**	White Clover	-	-
*Echium plantagineum**	Paterson's Curse	-	-
*Plantago lanceolata**	Plantago lanceolate	-	-
*Lysimachia arvensis/ Anagallis arvensis**	Scarlet Pimpernel	-	-
*Carduus nutans subsp. nutans**	Nodding Thistle	-	-
*Conyza sumatrensis**	Tall Fleabane	-	-
*Hordeum leporinum**	Barley Grass	-	-
*Rumex acetosella**	Red Sorrel	-	-
*Veronica persica**	Birdeye Speedwell	-	-
*Bromus sp. **	-	-	-
*Spergularia sp. **	-	-	-
*Conyza bonariensis**	-	-	-
*Phalaris canariensis**	Canary Grass	-	-
*Cynodon dactylon**	Bermuda Grass	-	-
*Note: * denotes exotic species*			

BIRD UTILISATION SURVEY (BUS) RESULTS; 02/02/2021 – 10/02/2021

Bird Utilisation Survey (BUS) Results; 02/02/2021 – 10/02/2021

BUS Number	Species & Count	~Height from Observation Point (m)	~Distance from Observation Point (m)	Time and Weather Conditions
1	2 Eastern Rosellas 3 Red Wattlebirds 1 Wedge tailed Eagle 1 White-eared Honeyeater	0-30 0-30 0-30 0-30	100 150 400 100	6:20 pm, 25°C, light cloud, light breeze, no rain.
2	1 Red Wattlebird 2 Crimson Rosellas 2 Magpies	0-30	100 100 500	1:05 pm, 23°C, light cloud, light breeze, no rain.
3	1 Wedge-tailed Eagle	30-250	500	1:12am, 22°C, light cloud, light breeze, no rain.
4	10 Sulphur Crested Cockatoos 1 Australian Pipit 1 Australian Kestrel 2 Australian Magpies 2 Wedge tailed Eagles	30-250 0-30 0-30/30-250 0-30 30-250	700 50 300 200 600	5:33 pm, 26°C, moderate cloud, no wind, no rain.
5	2 Australian Kestrel – 30-250 m 2 Fairy Martins– 0-30 m 4 Yellow-tailed Black Cockatoos 2 Australian Magpies 2 Wedge-tailed Eagles	30-250 0-30 0-30 / 30-250 0-30 30-250	150 50 150 100 700	5:58 pm, 24°C, Moderate cloud, light breeze, no rain.
6	1 Brown Falcon 2 Wedge-tailed Eagles 2 Galahs	0-30 30-250 30-250	500 700 300	3:00 pm, 27°C, moderate cloud, light breeze, no rain.

Bird Utilisation Survey (BUS) Results; 02/02/2021 – 10/02/2021

BUS Number	Species & Count	~Height from Observation Point (m)	~Distance from Observation Point (m)	Time and Weather Conditions
	4 Crimson Rosellas	0-30	100	
7	1 Wedge-tailed Eagle	30-250	500	2:26 pm, 26°C, moderate wind, moderate cloud, no rain.
8	2 Australian Kestrels 1 Red Wattlebird	30-250 0-30	100 100	2:01 pm, 26°C, moderate cloud, moderate wind, no rain.
9	4 Noisy Miners 3 Australian Magpies	0-30 0-30	100 100	1:08 pm, 26°C, moderate cloud, light breeze, no rain.
10	1 White-faced Heron	0-30	100	1:07 pm, 28°C, light cloud, heavy wind, no rain.
11	4 Australian Magpies 2 Noisy Miners 4 Eastern Rosellas	0-30 0-30 0-30	250 100 100	5:32 pm, 23°C, moderate cloud, light breeze, no rain.
12	4 Australian Magpies 2 Noisy Miners 4 Eastern Rosellas	0-30 0-30 0-30	150 200 150	5:32 pm, 23°C, moderate cloud, light breeze, no rain.
13	8 Australian Magpies	0-30	150	6:38 pm, 20°C, moderate cloud, moderate wind, no rain.
14	4 Wedge-tailed Eagles 4 Sulphur Crested Cockatoo 1 Australian Kestrel	30-250 0-30 / 30-250 30-250	600 200 100	4:23 pm, 26°C, moderate cloud, light breeze, no rain.
15	2 Wedge-tailed Eagles 1 Red Wattlebird 2 Eastern Rosellas 4 Magpies	30-250 0-30 0-30 0-30	400 50 100 100	4:47 pm, 26°C, moderate cloud, light wind, no rain.
16	1 Australian Pipit 3 Australian Magpie 2 Galah	0-30 0-30 / 30-250 30-250	50 100 100	7:14 am, 22°C, light cloud, light breeze, no rain.
17	2 Australian hobbies	30-250	50	6:10 am, 23°C, light cloud, light breeze, no rain.
18	No birds observed.			1:35 pm, 27°C, moderate cloud, no wind, rain.
19 (Extra)	2 noisy miners 1 magpie	0-30 0-30	50 100	2:34 pm, 27°C, moderate cloud, moderate wind, no rain.
20 (Extra – Scribbly Gum)	1 White-throated Treecreeper 2 Grey Fantail 1 Black-faced Cuckoo Shrike	0-30 0-30 0-30	50 50 50	4:45 pm 26°C, light cloud, no wind, rain.

APPENDIX B PRELIMINARY LIKELIHOOD OF OCCURRENCE TABLE

Preliminary Likelihood of Occurrence Table

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	BioNet Records with 10 km	Habitat Summary	Likelihood of Occurrence	Recorded during field surveys
Amphibians							
Litoria booroolongensis	Booroolong Frog	E	E	2	The Booroolong Frog inhabits the western-flowing streams of the Great Dividing Range. The species is rare throughout most of the remainder of its range. The species live along permanent streams with some fringing vegetation cover such as ferns, sedges or grasses. The adults occur on or near cobble banks and other rock structures within stream margins. They shelter under rocks or amongst vegetation near the ground on the stream edge. Sometimes they can be found basking in the sun on exposed rocks near flowing water during summer. Breeding occurs in spring and early summer and tadpoles metamorphose in late summer to early autumn. Eggs are laid in submerged rock crevices and tadpoles grow in slow-flowing connected or isolated pools.	Considering the records within the locality but the lack of suitable habitat, this species is **unlikely t**o occur within the project boundary.	No
Heleioporus australiacus	Giant Burrowing Frog	V	V	0	The Giant Burrowing Frog is found in heath, woodland and open dry sclerophyll forest on a variety of soil types except those that are clay based. In non-breeding seasons it burrows below the soil surface or in the leaf litter. Individuals move into breeding sites either immediately before or following heavy rain and occupy these sites for up to 10 days. Breeding habitat of this species is generally soaks or pools within first or second order streams. They are also commonly recorded from 'hanging swamp' seepage lines	Considering the lack of records within the locality and lack of suitable habitat, the species is **unlikely** to occur in the project boundary.	No

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	BioNet Records with 10 km	Habitat Summary	Likelihood of Occurrence	Recorded during field surveys
					and where small pools form from the collected water. When breeding, frogs will call from open spaces, under vegetation or rocks or from within burrows in the creek bank. This species breeds mainly in autumn, but has been recorded calling throughout the year. Egg masses are foamy with an average of approximately 500-800 eggs and are laid in burrows or under vegetation in small pools. After rains, tadpoles are washed into larger pools where they complete their development in ponds or ponded areas of the creekline.		
Mixophyes balbus	Stuttering Frog	E	V	6	The Stuttering Frog is typically found on the eastern side of the Great Dividing Range often in association with permanent streams throughout temperate and sub-tropical rainforest and wet sclerophyll forest. The species is rarely found in dry open tableland riparian vegetation or in moist gullies in dry forest. The species shows a preference for the interiors of large forest tracts in areas with relatively cool mean annual temperatures, sites typically free from any disturbance with a thick canopy and relatively simple understorey. The species occurs along first order streams and is occasionally associated with springs. The species is not associated with ponds or ephemeral pools. Outside the breeding season adults live in deep leaf litter and thick understorey vegetation on the forest floor.	Considering the records within the locality but the lack of suitable habitat, the species is **unlikely** to occur in the project boundary.	No
Birds							
Anthochaera phrygia	Regent Honeyeater	CE	CE	0	The Regent Honeyeater mainly inhabits temperate woodlands and open forests, particularly Box – Ironbark woodland and riparian forests of River She-oak. The species	Considering the lack of records within the locality and the lack of suitable habitat, this species is	No

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	BioNet Records with 10 km	Habitat Summary	Likelihood of Occurrence	Recorded during field surveys
					inhabits woodlands that support a significantly high abundance and species richness of birds. These types of woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes. The species can also be found in drier coastal woodlands and forests in some years. Non-breeding flocks of the species can be seen foraging in flowering coastal Swamp Mahogany and Spotted Gum forests. Although the species is a generalist forager, it feeds mainly on the nectar from a small number of eucalypts that produce high volumes of nectar (e.g. Mugga Ironbark, Yellow Box, White Box and Swamp Mahogahy).	**unlikely** to occur within the project boundary.	
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	V	-	1	Found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and River Red Gum (*Eucalyptus camaldulensis*) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses; usually not found in woodlands with a dense shrub layer; fallen timber is an important habitat component for foraging; also recorded, though less commonly, in similar woodland habitats on the coastal ranges and plains. Sedentary, considered to be resident in many locations throughout its range; present in all seasons or year-round at many sites; territorial year-round, though some birds may disperse locally after breeding. Gregarious and usually observed in pairs or small groups of 8 to 12 birds; terrestrial and	Considering the records within the locality and the presence of preferred habitat, this species is **likely** to occur within the project boundary.	No

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	BioNet Records with 10 km	Habitat Summary	Likelihood of Occurrence	Recorded during field surveys
					arboreal in about equal proportions; active, noisy and conspicuous while foraging on trunks and branches of trees and amongst fallen timber; spend much more time foraging on the ground and fallen logs than other treecreepers.		
Daphoenositta chrysoptera	Varied Sittella	V	-	7	The Varied Sittella is sedentary and inhabits most of mainland Australia except the treeless deserts and open grasslands. Distribution in NSW is nearly continuous from the coast to the far west. Varied Sittella inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and *Acacia* woodland. It feeds on arthropods gleaned from crevices in rough or decorticating bark, dead branches, standing dead trees and small branches and twigs in the tree canopy. It builds a cup-shaped nest of plant fibres and cobwebs in an upright tree fork high in the living tree canopy, and often re-uses the same fork or tree in successive years.The time between two consecutive generations in Varied Sittelas' is estimated to be 5 years.	Considering the records within the locality and the presence of suitable habitat, this species is **likely** to occur within the project boundary.	No
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V	-	2	Dusky Woodswallow inhabit dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris. It has also been recorded in shrublands, heathlands and very occasionally in moist forest or rainforest. Also found in farmland, usually at the edges of forest or woodland. Depending on location and local climatic conditions (primarily temperature and rainfall),	Considering the records within the locality and the presence of preferred habitat, this species is **likely** to occur within the project boundary.	No

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	BioNet Records with 10 km	Habitat Summary	Likelihood of Occurrence	Recorded during field surveys
					the dusky woodswallow can be resident year round or migratory.		
Grantiella picta	Painted Honeyeater	V	V	0	The Painted Honeyeater inhabits Boree/ Weeping Myall (*Acacia pendula*), Brigalow (*A. harpophylla*) and Box-Gum Woodlands and Box-Ironbark Forests. A specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus *Amyema*. Insects and nectar from mistletoe or eucalypts are occasionally eaten. Nest from spring to autumn in a small, delicate nests hanging within the outer canopy of drooping eucalypts, she-oak, paperbark or mistletoe branches.	Considering the lack of records within the locality but the presence of preferred habitat, this species has the **potential** to occur within the project boundary.	No
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	V	-	1	Occupies mostly upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts, especially Mugga Ironbark (Eucalyptus sideroxylon), White Box (E. albens), Inland Grey Box (E. microcarpa), Yellow Box (E. melliodora), Blakely's Red Gum (E. blakelyi) and Forest Red Gum (E. tereticornis). Also inhabits open forests of smooth-barked gums, stringybarks, ironbarks, river sheoaks (nesting habitat) and tea-trees. Feeding territories are large making the species locally nomadic. Recent studies have found that the Black-chinned Honeyeater tends to occur in the largest woodland patches in the landscape as birds forage over large home ranges of at least 5 hectares.	Considering the records within the locality and the presence of suitable habitat, this species has the **potential** to occur within the project boundary.	No
Hieraaetus morphnoide	Little Eagle	V	-	1	The Little Eagle is found throughout the Australian mainland except in the most densely forested parts of the Dividing Range escarpment. It occurs as a single population throughout NSW.	Considering the records within the locality and the presence of preferred habitat, this species has the **likely** to occur within the project boundary.	No

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	BioNet Records with 10 km	Habitat Summary	Likelihood of Occurrence	Recorded during field surveys
					Occupies open eucalypt forest, woodland or open woodland. She-oak 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. Females lay two or three eggs during spring, and young fledge in early summer. The species preys on birds, reptiles and mammals, occasionally adding large insects and carrion.		
Hirundapus caudacutus	White-throated Needletail	-	V, Mi	2	The White-throated Needletail is a large swift species widespread in eastern and south-eastern Australia during its non-breeding season. The species is recorded in all coastal regions of Queensland and NSW, extending inland to the western slopes of the Great Divide and occasionally onto the adjacent inland plains. 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. They almost always forage aerially, above a wide variety of habitats ranging from heavily treed forests to open habitats, such as farmland, heathland or mudflats.	Considering the records within the locality and the presence of suitable habitat, this species is **likely** to occur within the project boundary	No
Lathamus discolor	Swift Parrot	E	CE	0	The Swift Parrot breeds in Tasmania and migrates to south-east Australia during its non-breeding stage (March to October). In the mainland, the species occurs in areas where eucalypts are flowering profusely or where there are abundant lerp infestations. Favoured feed trees include Swamp Mahogany (*Eucalyptus robusta*), Spotted Gum (*Corymbia maculata*), Red Bloodwood (*C. gummifera*), Mugga Ironbark (*E. sideroxylon*) and White Box (*E. albens*).	Considering the lack of records within the locality but the presence of suitbale habitat, this species has the **potential** to occur within the project boundary.	No

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	BioNet Records with 10 km	Habitat Summary	Likelihood of Occurrence	Recorded during field surveys
Ninox strenua	Powerful Owl	V	-	7	The Powerful Owl inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest. The species requires large tracts of forest or woodland habitat but can also occur in fragmented landscapes. 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. Most prey species, gliders and possums, require hollows and a shrub layer, therefore making these important habitat components for the owl. Powerful Owls nest in large tree hollows (at least 0.5 m deep), in large eucalypts (diameter at breast height of 80-240 cm) that are at least 150 years old. While the female and young are in the nest hollow the male Powerful Owl roosts nearby (10-200 m) guarding them, often choosing a dense "grove" of trees that provide concealment from other birds that harass him.	Considering the records within the locality and the presence of preferred habitat, this species is **likely** to occur within the project boundary.	No
Numenius madagascariensis	Far Eastern Curlew	-	CE	0	The Eastern Curlew is a wader bird with primarily coastal distribution in Australia. 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.	Considering the lack of records within the locality and lack of suitable habitat, this species is **unlikely** to occur within the project boundary.	No

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	BioNet Records with 10 km	Habitat Summary	Likelihood of Occurrence	Recorded during field surveys
					Occasionally, the species occurs on ocean beaches (often near estuaries), and coral reefs, rock platforms, or rocky islets. 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. It roosts on sandy spits and islets, especially on dry beach sand near the high-water mark, and among coastal vegetation including low saltmarsh or mangroves. May also roost on wooden oyster leases or other similar structures. The Eastern Curlew is carnivorous, mainly eating crustaceans (including crabs, shrimps and prawns), small molluscs, as well as some insects.		
Glossopsitta pusilla	Little Lorikeet	V	-	1	Forages primarily in the canopy of open Eucalyptus forest and woodland, yet also finds food in Angophora, Melaleuca and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity. Isolated flowering trees in open country, e.g. paddocks, roadside remnants and urban trees also help sustain viable populations of the species. Feeds mostly on nectar and pollen, occasionally on native fruits such as mistletoe, and only rarely in orchards Roosts in treetops, often distant from feeding areas.	Considering the record within the locality and the presence of preferred habitat, this species is **likely** to occur within the project boundary.	No
Petroica boodang	Scarlet Robin	V	-	9	The Scarlet Robin lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs. This species lives in both mature and regrowth vegetation. It occasionally occurs in mallee or wet forest communities, or in wetlands and tea-	The Scarlet Robin was identified within the project area during the 2014 ERM field surveys. **Known.**	Yes (ERM, 2014)

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	BioNet Records with 10 km	Habitat Summary	Likelihood of Occurrence	Recorded during field surveys
					tree swamps. Its habitat usually contains abundant logs and fallen timber. It breeds on ridges, hills and foothills of the western slopes, the Great Dividing Range and eastern coastal regions; this species is occasionally found up to 1000 metres in altitude. It breeds between July and January. In autumn and winter many Scarlet Robins live in open grassy woodlands, and grasslands or grazed paddocks with scattered trees. It builds nests in the fork of branches, usually more than 2 metres above the ground.		
Petroica phoenicea	Flame Robin	V	-	5	The Flame Robin is a small insectivorous robin endemic to south eastern Australia. In NSW, it breeds in upland areas and in winter, many birds move to the inland slopes and plains. It is likely that there are two separate populations in NSW, one in the Northern Tablelands, and another ranging from the Central to Southern Tablelands. Breeds in upland tall moist eucalypt forests and woodlands, often on ridges and slopes. Prefers clearings or areas with open understoreys. The ground layer of the breeding habitat is dominated by native grasses and the shrub layer may be either sparse or dense. Occasionally occurs in temperate rainforest, and also in herbfields, heathlands, shrublands and sedgelands at high altitudes. In winter, birds migrate to drier more open habitats in the lowlands (i.e. valleys below the ranges, and to the western slopes and plains). Often occurs in recently burnt areas; however, habitat becomes unsuitable as vegetation closes up following regeneration. In winter lives in dry forests, open woodlands and in pastures	The Flame Robin was identified within the project area during the 2014 ERM field surveys. **Known.**	Yes (ERM, 2014)

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	BioNet Records with 10 km	Habitat Summary	Likelihood of Occurrence	Recorded during field surveys
					and native grasslands, with or without scattered trees. In winter, occasionally seen in heathland or other shrublands in coastal areas. Birds forage from low perches, from which they sally or pounce onto small invertebrates which they take from the ground or off tree trunks, logs and other coarse woody debris.		
Rostratula australis	Australian Painted-snipe	E	E	0	The Australian Painted Snipe is small freshwater wader. Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. Nests on the ground amongst tall vegetation, such as grasses, tussocks or reeds. The nest consists of a scrape in the ground, lined with grasses and leaves. Breeding is often in response to local conditions; generally occurs from September to December. Incubation and care of young is all undertaken by the male only. Forages nocturnally on mud-flats and in shallow water. Feeds on worms, molluscs, insects and some plant-matter.	Considering the lack of records within the locality and lack of suitable habitat, this species is **unlikely** to occur within the project boundary.	No
Botaurus poiciloptilus	Australasian Bittern	E	E	0	The Australasian Bittern is a large, stocky bird, reaching up to 75 cm in length. The species favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes (*Typha* spp.) and spikerushes (*Eleocharis* spp.). They hide during the day amongst dense reeds or rushes and feed mainly at night on frogs, fish, yabbies, spiders, insects and snails. Breeding occurs in summer from October to January; nests are built in secluded places in densely-vegetated wetlands on a platform of reeds; there are usually six olive-brown eggs to a clutch.	Considering the lack of records within the locality and lack of suitable habitat, this species is **unlikely** to occur within the project boundary.	No

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	BioNet Records with 10 km	Habitat Summary	Likelihood of Occurrence	Recorded during field surveys
Calidris ferrunginea	Curlew Sandpiper	E	CE, Mi, Ma	0	The Curlew Sandpiper 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. It roosts on shingle, shell or sand beaches; spits or islets on the coast or in wetlands; or sometimes in salt marsh, among beach-cast seaweed, or on rocky shores.	Considering the lack of records within the locality and lack of suitable habitat, this species is **unlikely** to occur within the project boundary.	No
Falco hypoleucos	Grey Falcon	E	V	0	The Grey Falcon is sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. The breeding range has contracted since the 1950s with most breeding now confined to arid parts of the range. There are possibly less than 5000 individuals left. Population trends are unclear, though it is believed to be extinct in areas with more than 500mm rainfall in NSW. The Grey Flacon is usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast. Preys primarily on birds, especially parrots and pigeons, using high-speed chases and stoops; reptiles and mammals are also taken. Like other falcons it utilises old nests of other birds of prey and ravens, usually high in a living eucalypt near water or a watercourse; peak laying season is in late winter and early spring; two or three eggs are laid.	Considering the lack of records within the locality but the presence of preferred habitat, this species has the **potential** to occur within the project boundary.	No

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	BioNet Records with 10 km	Habitat Summary	Likelihood of Occurrence	Recorded during field surveys
Callocephalon fimbriatum	Gang-gang Cockatoo	V	-	9	In spring and summer, the Gang-gang Cockatoos are 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. Favours old growth forest and woodland attributes for nesting and roosting. Nests are located in hollows that are 10 cm in diameter or larger and at least 9 m above the ground in eucalypts.	Gang-gang Cockatoo's were identified during the February 2021 surveys. **Known** to occur.	Yes
Flora							
Thesium australe	Austral Toadflax	V	V	0	Occurs in grassland on coastal headlands or grassland and grassy woodland away from the coast. A root parasite that takes water and some nutrient from other plants, especially Kangaroo Grass (*Themeda triandra*). It occurs in subtropical, temperate and subalpine climates over a wide range of altitudes. It occurs on soils derived from sedimentary, igneous and metamorphic geology on a range of soils including black clay loams to yellow podzolics and peaty loams. It occurs in shrubland, grassland or woodland, often on damp sites. Vegetation types include open grassy heath dominated by Swamp Myrtle (*Leptospermum myrtifolium*), Small-fruit Hakea (*Hakea microcarpa*), Alpine Bottlebrush (*Callistemon sieberi*), Woolly Grevillea (*Grevillea lanigera*), Coral Heath *(Epacris microphylla*) and Poa spp.; Kangaroo Grass grassland surrounded by Eucalyptus woodland; and	Considering the lack of records within the locality and the lack of suitable habitat this species is **Unlikely** to occur.	No

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	BioNet Records with 10 km	Habitat Summary	Likelihood of Occurrence	Recorded during field surveys
					grassland dominated by Barbed-wire Grass (*Cymbopogon refractus*).		
Acacia bynoeana	Bynoes's Wattle	E	V	0	Bynoe's wattle is found in central eastern NSW, from the Hunter District (Morisset) south to the Southern Highlands and west to the Blue Mountains. The species is currently known from about 30 locations, with the size of the populations at most locations being very small (1-5 plants). It has recently been found in the Colymea and Parma Creek areas west of Nowra. The species occurs in heath or dry sclerophyll forest on sandy soils and seems to prefer open, sometimes slightly disturbed sites such as trail margins, edges of roadside spoil mounds and in recently burnt patches. It is associated with overstorey species including Red Bloodwood, Scribbly Gum, Parramatta Red Gum, Saw Banksia and Narrow-leaved Apple.	Considering the lack of records within the locality but the presence of suitable habitat, this species has the **potential** to occur.	No
Baloskion longipes	Dense Cord-rush	V	V	0	Dense Cord-rush has been recorded from the Kanangra-Boyd area to the Southern Tablelands but all recorded populations are small. Populations have been recorded in Blue Mountains National Park, Kanangra-Boyd National Park, Penrose State Forest (in Hanging Rock Swamp), Morton National Park (The Vines), the Clyde Mountain area and Ballalaba (south of Braidwood). The species is commonly found in swamps or depressions in sandy alluvium, sometimes growing with sphagnum moss. It also occurs in swails within tall forest, and in Black Gum (Eucalyptus aggregata) Woodland.	Considering the lack of records within the locality and the lack of suitable habitat, this species is **unlikely** to occur.	No
Diuris aequalis	Buttercup Doubletail	E	V	0	The buttercup doubletail has been recorded in Kanangra-Boyd National Park, Gurnang State	Considering the lack of records within the locality and the lack of	No

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	BioNet Records with 10 km	Habitat Summary	Likelihood of Occurrence	Recorded during field surveys
					Forest, towards Wombeyan Caves, the Taralga - Goulburn area, and the ranges between Braidwood, Tarago and Bungendore. The species has been recorded in forest, low open woodland with grassy understorey and secondary grassland on the higher parts of the Southern and Central Tablelands (especially on the Great Dividing Range). Populations tend to contain few, scattered individuals; despite extensive surveys, only about 200 plants in total, from 20 populations are known.	suitable habitat this species is **Unlikely** to occur.	
Eucalyptus aggregata	Black Gum	V	V	0	In NSW the Black Gum occurs in the South Eastern Highlands Bioregion and on the western fringe of the Sydney Basin Bioregion. Black Gum has a moderately narrow distribution, occurring mainly in the wetter, cooler and higher parts of the tablelands. The Black Gum grows in the lowest parts of the landscape on alluvial soils, on cold, poorly-drained flats and hollows adjacent to creeks and small rivers. It often grows with other cold-adapted eucalypts, such as Snow Gum or White Sallee (Eucalyptus pauciflora), Manna or Ribbon Gum (E. viminalis), Candlebark (E. rubida), Black Sallee (E. stellulata) and Swamp Gum (E. ovata). Black Gum usually occurs in an open woodland formation with a grassy groundlayer dominated either by River Tussock (Poa labillardierei) or Kangaroo Grass (Themeda australis), but with few shrubs. The species also occurs as isolated paddock trees in modified native or exotic pastures.	Considering the lack of records within the locality and the presence of suitable habitat, this species is **likely** to occur within the project boundary.	No
Kunzea cambagei	Cambage Kunzea	V	V	0	Kunzea cambagei mainly occurs in the western and southern parts of the Blue Mountains, NSW,	Considering the lack of records within the locality and the lack of	No

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	BioNet Records with 10 km	Habitat Summary	Likelihood of Occurrence	Recorded during field surveys
					mainly the Yerranderie/Mt Werong area, with four main populations with 20 to 150 individuals. Populations are also located west of Berrima, along the Wingecarribee River; Loombah Plateau east of Mount Werong; the Oberon-Colong Stock Route within Kanangra-Boyd National Park (NP); and Wanganderry Plateau within the Nattai NP. Cambage Kunzea is restricted to damp, sandy soils in wet heath or mallee open scrub at higher altitudes on sandstone outcrops or Silurian group sediments. Flowering occurs between September and November.	suitable habitat this species is **Unlikely** to occur.	
Lepidium hyssopifolium	Basalt Pepper-cress	E	E	0	In NSW, there is a small population near Bathurst, one populations at Bungendore, and one near Crookwell. In NSW the species was known to have occurred in both woodland with a grassy understorey and in grassland. The species may be a disturbance opportunist, as it was discovered at the most recently discovered site (near Bungendore) following soil disturbance. The cryptic and non-descript nature (appearing like several weed species) of the species makes it hard to detect.	Considering the lack of records within the locality and the presence of suitable habitat, this species has the **potential** to occur.	No
Leucochrysum albicans subsp. tricolor	Hoary Sunray	-	E	0	In NSW it currently occurs on the Southern Tablelands adjacent areas in an area roughly bounded by Albury, Bega and Goulburn, with a few scattered localities know from beyond this region. Occurs in a wide variety of grassland, woodland and forest habitats, generally on relatively heavy soils. The species can occur in modified habitats such as semi-urban areas and roadsides.	Considering the lack of records within the locality but the presence of preferred habitat, this species has the **potential** to occur within the project boundary.	No

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	BioNet Records with 10 km	Habitat Summary	Likelihood of Occurrence	Recorded during field surveys
					Highly dependent on the presence of bare ground for germination and in some areas, disturbance is required for successful establishment.		
Pomaderris cotoneaster	Cotoneaster Pomaderris	E	E	0	Cotoneaster Pomaderris has been recorded in a range of habitats in predominantly forested country. The habitats include forest with deep, friable soil, amongst rock beside a creek, on rocky forested slopes and in steep gullies between sandstone cliffs. Little is known about the ecology of the species. It is probably killed by fire however plants have been observed to re-sprout from the stem following death of the crown from apparent drought. Populations tend to be isolated and range in size from a few individuals to many hundreds.	Considering the lack of records within the locality and the lack of suitable habitat this species is **Unlikely** to occur.	No
Rhizanthella slateri	Eastern Underground Orchid	V	E	0	In NSW, the species is currently known from fewer than 10 locations, including near Bulahdelah, the Watagan Mountains, the Blue Mountains, Wiseman's Ferry area, Agnes Banks and near Nowra. Habitat requirements are poorly understood and no particular vegetation type has been associated with the species, although it is known to occur in sclerophyll forest. Highly cryptic given that it grows almost completely below the soil surface, with flowers being the only part of the plant that can occur above ground. Therefore usually located only when the soil is disturbed. Flowers September to November.	Considering the lack of records within the locality and the presence of suitable habitat, this species has the **potential** to occur	No
Trachymene scapigera	Mountain Trachymene	E	E	0	This species occurs at around four general locations between Jenolan caves and Gurnang State Forest on the Central Tablelands south east of Oberon.	Considering the lack of records within the locality and the presence of suitable habitat, this species has the **potential** to occur.	No

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	BioNet Records with 10 km	Habitat Summary	Likelihood of Occurrence	Recorded during field surveys
					Associated vegetation across known sites varies from riparian tea-tree thickets to tall forest, to frost hollows and includes the following species: *Leptospermum obovatum, Eucalyptus fastigata, E. dalrympleana, Acacia melanoxylon, E. stellulata, E. pauciflora, E. rubida.* Despite being perennial, above-ground parts of this herb die back over winter. Over winter, the leaves turn brown and die with total foliage loss occurring for many patches around July. By October, regrowth of the foliage has commenced and seedlings emerge. Flowers from December until March, with seed dispersing in April. Seed viability declines precipitously after dispersal, with almost no viable seed remaining after 12 months.		
Xerochrysum palustre	Swamp Everlasting	-	V	0	Grows in wetlands including sedge swamps and shallow freshwater marshes, often on heavy black clay soils. Commonly associated with genera including *Amphibromus, Baumea, Carex, Chrisandra, Craspedia, Eleocharis, Isolepis, Lechnagrostis, Lepidosperma, Myriophyllum, Phragmites, Themeda and Villarsia.*	Considering the lack of records within the locality and the lack of suitable habitat this species is **Unlikely** to occur.	No
Reptiles							
Aprasia parapulchella	Pink-tailed Worm-lizard, Pink-tailed Legless Lizard	V	V	0	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.	Considering the lack of records within the locality and the presence of suitable habitat, this species has the **potential** to occur.	No

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	BioNet Records with 10 km	Habitat Summary	Likelihood of Occurrence	Recorded during field surveys
					Inhabits sloping, open woodland areas with predominantly native grassy groundlayers, particularly those dominated by Kangaroo Grass (*Themeda australis*). 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.		
Delmar impar	Striped Legless Lizard, Striped Snake-lizard	V	V	0	Populations are known in the Goulburn, Yass, Queanbeyan, Cooma, Muswellbrook and Tumut areas. Found mainly in Natural Temperate Grassland but has also been captured in grasslands that have a high exotic component. The species has also found in secondary grassland near Natural Temperate Grassland and occasionally in open Box-Gum Woodland. Habitat is where grassland is dominated by perennial, tussock-forming grasses such as Kangaroo Grass *Themeda australis*, spear-grasses *Austrostipa spp.* and poa tussocks *Poa spp*., and occasionally wallaby grasses *Austrodanthonia spp.* Sometimes present in modified grasslands with a significant content of exotic grasses. Sometimes found in grasslands with significant amounts of surface rocks, which are used for shelter and sometimes utilises dried cowpats for shelter. Goes below ground or under rocks or logs over winter.	Considering the lack of records within the locality and the presence of suitable habitat, this species has the **potential** to occur.	No
Mammals							

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	BioNet Records with 10 km	Habitat Summary	Likelihood of Occurrence	Recorded during field surveys
Chalinolobus dwyeri	Large-eared Pied Bat	V	V	0	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. They remain loyal to the same cave over many years. Found in well-timbered areas containing gullies. The relatively short, broad wing combined with the low weight per unit area of wing indicates manoeuvrable flight. This species probably forages for small, flying insects below the forest canopy. Likely to hibernate through the coolest months. It is uncertain whether mating occurs early in winter or in spring.	Considering the lack of records within the locality and the lack of preferred habitat, this species is **unlikely** to occur.	
Dasyurus maculatus	Spotted-tailed Quoll	V	E	2	The Spotted-Tailed Quoll is recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Individual animals use hollow-bearing trees, fallen logs, small caves, rock outcrops and rocky-cliff faces as den sites. Females occupy home ranges up to about 750 hectares and males up to 3500 hectares. Are known to traverse their home ranges along densely vegetated creeklines.	Considering the records within the locality and the presence of preferred habitat this species is **likely** to occur	No
Miniopterus orianae oceanensis	Large Bent-winged Bat	V	-	2	Large Bent-wing bats occur along the east and north-west coasts of Australia. Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures. Form discrete populations centred on a maternity cave that is	The Large Bent-wing Bat was possibly recorded during the ERMs 2014 field surveys. Considering the records within the locality and presence of preferred habitat, this	Possible call identification (ERM, 2014)

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	BioNet Records with 10 km	Habitat Summary	Likelihood of Occurrence	Recorded during field surveys
					used annually in spring and summer for the birth and rearing of young. Maternity caves have very specific temperature and humidity regimes. At other times of the year, populations disperse within about 300 km range of maternity caves. Cold caves are used for hibernation in southern Australia.	species has the **Likely** to occur within the project boundary.	
Scoteanax rueppellii	Greater Broad-nosed Bat	V	-	1	The Greater Broad-nosed Bat utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest. Although this species usually roosts in tree hollows, it has also been found in buildings. Forages after sunset, flying slowly and directly along creek and river corridors at an altitude of 3 - 6 m. Open woodland habitat and dry open forest suits the direct flight of this species as it searches for beetles and other large, slow-flying insects; this species has been known to eat other bat species.	The Greater Broad-nosed Bat was possibly recorded during the ERMs 2014 field surveys. Considering the records within the locality and presence of preferred habitat, this species has the **Likely** to occur within the project boundary	Possible call identification (ERM, 2014)
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V	-	8	The Eastern False Pipistrelle prefers moist habitats, with trees taller than 20m. Generally roosts in Eucalypt hollows and under loose bark on trees or buildings. Hunts beetles, moths, weevils and other flying insects above or just below the tree canopy.	The Eastern False Pipistrelle was possibly recorded during the ERMs 2014 field surveys. Considering the records within the locality and presence of preferred habitat, this species has the **Likely** to occur within the project boundary	Possible call identification (ERM, 2014)
Petauroides volans	Greater Glider	E	V	32	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 elevation range from sea level to 1200 m above sea level. The greater glider is an arboreal nocturnal marsupial, largely restricted to eucalypt forests and woodlands. During the day it shelters in tree	Considering the records within the locality and the presence of preferred habitat, this species is **likely** to occur within the project boundary.	No

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	BioNet Records with 10 km	Habitat Summary	Likelihood of Occurrence	Recorded during field surveys
					hollows, with a particular selection for large hollows in large, old trees. The greater glider is considered to be particularly sensitive to forest clearance.		
Petrogale penicillata	Brush-tailed rock-wallaby	E	V	0	In NSW the Brush-tailed rock-wallaby occurs from the Queensland border in the north to Shoalhaven in the south, with the population in the Warrumbungle Ranges being the western limit. Occupy rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges, often facing north. Shelter or bask during the day in rock crevices, caves and overhangs and are most active at night when foraging. Browse on vegetation in and adjacent to rocky areas eating grasses and forbs as well as the foliage and fruits of shrubs and trees.	Considering the lack of records within the locality and the lack of preferred habitat, this species is **unlikely** to occur.	No
Phascolarctos cinereus	Koala	V	V	1	The Koala is an arboreal marsupial that inhabits eucalypt woodlands and forests. The species feed on the foliage of more than 70 species of eucalypt and 30 non-eucalypt species.	Considering the records within the locality and the presence of preferred habitat, this species is **likely** to occur within the project boundary.	No
Pseudomys novaehollandiae	New Holland Mouse	-	V	0	The New Holland Mouse has been found from coastal areas and up to 100 km inland on sandstone country. The species has been recorded from sea level up to around 900 m above sea level. Soil type may be an important indicator of suitability of habitat for the New Holland Mouse, with deeper top soils and softer substrates being preferred for digging burrows. In Victoria, the species has been recorded on deep siliceous podsols, sandy clay, loamy sands, sand dunes and coastal dunes. Other factors such as slope,	Considering the lack of records within the locality and the lack of suitable habitat, this species is **unlikely** to occur within the project boundary.	No

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	BioNet Records with 10 km	Habitat Summary	Likelihood of Occurrence	Recorded during field surveys
					geology and the amount of sun received in an area may also influence site selection. Across the species' range, the New Holland Mouse is known to inhabit open heathland, open woodland with a heathland understorey and vegetated sand dunes. Due to the largely granivorous diet of the species, sites where the New Holland Mouse is found are often high in floristic diversity, especially leguminous perennials.		
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	0	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. 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. Feed on the nectar and pollen of native trees, in particular Eucalyptus, Melaleuca and Banksia, and fruits of rainforest trees and vines. Also forage in cultivated gardens and fruit crops.	Considering the lack of records within the locality but the presence of preferred habitat, this species has **potential** to occur within the project boundary.	No
Varanus rosenbergi	Rosenberg's Goanna	V	-	1	Rosenberg's Goanna occurs in the Sydney, Goulburn and ACT regions and near Cooma in the south. They have been found in heath, open forest and woodland and tend to associated with termites. Termite mounds are a critical habitat component as they use these for nesting. Individuals require large areas of habitat, they feed on carrion, birds, eggs, reptiles and small mammals.	Considering the records within the locality and the presence of preferred habitat, this species is **likely** to occur within the project boundary.	No

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	BioNet Records with 10 km	Habitat Summary	Likelihood of Occurrence	Recorded during field surveys
					Shelter in hollow logs, rock crevices and in burrows, which they may dig for themselves, or they may use other species' burrows, such as rabbit warrens.		
Fish							
Maccullochella macquariensis	Trout Cod	-	E	0	Trout Cod habitat is not well understood, but they appear to favour deep, fast flowing waters. Cover is vital, and they are often found sheltering under snags (woody debris).	Considering the lack of records within the locality and the lack of suitable habitat this species is **unlikely** to occur within the project boundary.	No
Maccullochella peelii	Murray Cod	-	V	0	It occurs naturally in the waterways of the Murray–Darling Basin in a wide range of warm water habitats that range from clear, rocky streams to slow flowing turbid rivers and billabongs. The upper reaches of the Murray and Murrumbidgee Rivers are considered too cold to contain suitable habitat	Considering the lack of records within the locality and the lack of suitable habitat this species is **unlikely** to occur within the project boundary.	No
Macquaria australasica	Macquarie Perch	-	E	0	Originally widespread through the more midland–upland streams and rivers in the south-east corner of the Murray–Darling Basin, the distribution of this fish is now greatly reduced and patchy. Habitat for the Macquarie perch is bottom or mid-water in slow-flowing rivers with deep holes, typically in the upper reaches of forested catchments with intact riparian vegetation. Macquarie perch also do well in some upper catchment lakes. In some parts of its range, the species is reduced to taking refuge in small pools which persist in midland–upland areas through the drier summer periods.	Considering the lack of records within the locality and the lack of suitable habitat this species is **unlikely** to occur within the project boundary.	No
Insects							

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	BioNet Records with 10 km	Habitat Summary	Likelihood of Occurrence	Recorded during field surveys
Paralucia spinifera	Bathurst Copper Butterfly	E	V	0	Occurs on the Central Tablelands of NSW in an area approximately bounded by Oberon, Hartley and Bathurst. Occurs above 850 m elevation, most known sites have 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. Vegetation structure is commonly open woodland or open forest with a sparse understorey that is dominated by the shrub, Blackthorn *Bursaria spinosa subsp. lasiophylla.* Its lifecycle relies on a mutualistic relationship with the ant, *Anonychomyra itinerans*, and on the presence of *B. spinosa subsp. lasiophylla* which the larvae form of the butterfly feed exclusively on. The butterflies generally remain in the vicinity of B. spinosa subsp. lasiophylla, and are rarely observed more than 10 m distant from the plant.	Considering the lack of records within the locality but the presence of suitable habitat, this species has **potential** to occur within the project boundary	No
Synemon plana	Golden Sun Moth	E	CE	0	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. Occurs in Natural Temperate Grasslands and grassy Box-Gum Woodlands in which groundlayer is dominated by wallaby grasses *Austrodanthonia spp*. Grasslands dominated by wallaby grasses are typically low and open - the bare ground between the tussocks is thought to be an important microhabitat feature for the Golden Sun Moth, as it is typically these areas on which	Considering the lack of records within the locality but the presence of preferred habitat, this species has **potential** to occur within the project boundary	No

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	BioNet Records with 10 km	Habitat Summary	Likelihood of Occurrence	Recorded during field surveys
					the females are observed displaying to attract males. Habitat may contain several wallaby grass species, which are typically associated with other grasses particularly spear-grasses *Austrostipa spp.* or Kangaroo Grass *Themeda australis.*		

CE = Critically Endangered; E = Endangered; V = Vulnerable; Mi = Migratory

APPENDIX C RESULTS OF DATABASE SEARCHES

PROTECTED MATTERS SEARCH TOOL

The Protected Matters Search Tool was used to identify potential threatened and conservation significant species within a 10 kilometre radius of the project boundary. A total of 39 conservation significant species were detected as potentially occurring within 10km of the project.

Potential Threatened and Conservation Significant Species Identified by the PMST

Type	Scientific Name	Common Name	BD Act	EPBC Act
Birds	*Anthochaera phrygia*	Regent Honeyeater	CE	CE
	Botaurus poiciloptilus	Australasian Bittern	E	E
	Calidris ferrunginea	Curlew Sandpiper	E	CE, Mi, Ma
	Lathamus discolor	Swift Parrot	E	CE, Ma
	Falco hypoleucos	Grey Falcon	E	V
	Rostratula australis	Australian Painted-snipe	E	E
	Numenus madagascariensis	Eastern Curlew, Far Eastern Curlew	-	CE, Mi, Ma
	Grantiella picta	Painted Honeyeater	V	V
	Hirundapus caudacutus	White-throated Needletail	-	V, Mi, Ma
Mammals	*Chalinolobus dwyeri*	Large-eared Pied Bat	V	V
	Dasyurus maculatus maculatus (SE mainland population)	Spot-tailed Quoll (southeastern mainland population)	V	E
	Petrogale penicillata	Brush-tailed Rock-wallaby	E	V
	Petauroides volans	Greater Glider	E	V
	Phascolarctos cinereus	Koala	V	V
	Pseudomys novaehollandiae	New Holland Mouse	-	V
	Pteropus poliocephalus	Grey-headed Flying-fox	V	V
Reptiles	*Aprasia parapulchella*	Pink-tailed Worm-lizard, Pink-tailed Legless Lizard	V	V
	Delmar impar	Striped Legless Lizard, Striped Snake-lizard	V	V
Amphibians	*Litoria booroolongensis*	Booroolong Frog	E	E
	Mixophyes balbus	Stuttering Frog	E	V
	Heleioporus australiacus	Giant Burrowing Frog	V	V
Insects	*Paralucia spinifera*	Bathurst Copper Butterfly	E	V
	Synemon plana	Golden Sun Moth	E	CE
Fish	*Maccullochella macquariensis*	Trout Cod	-	E
	Maccullochella peelii	Murray Cod	-	V
	Macquaria australasica	Macquarie Perch	-	E
Plants	*Acacia bynoeana*	Bynoes's Wattle	E	V
	Baloskion longipes	Dense Cord-rush	V	V
	Diuris aequalis	Buttercup Doubletail	E	V
	Eucalyptus aggregata	Black Gum	V	V
	Kunzea cambagei	Cambage Kunzea	V	V

Type	Scientific Name	Common Name	BD Act	EPBC Act
	Lepidium hyssopifolium	Basalt Pepper-cress	E	E
	Leucochrysum albicans subsp. tricolor	Hoary Sunray	-	E
	Pomaderris cotoneaster	Cotoneaster Pomaderris	E	E
	Rhizanthella slateri	Eastern Underground Orchid	V	E
	Thesium austral	Austral Toadflax	V	V
	Trachymene scapigera	Mountain Trachymene	E	E
	Xerochrysum palustre	Swamp Everlasting	-	V

V = Vulnerable; E = Endangered; CE = Critically Endangered; Ma = Marine; Mi = Migratory

PROTECTED AREAS

No Protected Areas intercept the project area. Below details nearby Protected Areas as identified by the PMST.

Protected Areas Nearby the Project Site

Protected Areas	Occurrence	Presence within Project site	Distance from Project site
World heritage properties	Greater Blue Mountain Area	No	2 km
National heritage places	Greater Blue Mountain Area	No	2 km
Other protected areas	Abercrombie River National Park	No	<1 km (bordering project)
Ramsar wetlands of international importance	■ Banrock station wetland complex ■ Hattah-kulkyne lakes ■ Riverland ■ The Coorong, and Lakes Alexandrina and Albert Wetland	No	>50 km
Commonwealth marine areas	No	No	>50 km
The Great Barrier Reef Marine Park	No	No	>50 km
Alliance for Zero Extinction Sites	No	No	>50 km
Important Bird and Biodiversity Areas	No	No	>50 km

THREATENED ECOLOGICAL COMMUNITIES

In accordance with state vegetation mapping data there are potentially vegetation communities within the project boundary that conform to the criteria of three threatened ecological communities (TECs) listed under the BC Act and one (1) listed under the EPBC Act. The TECs include:

BC Act:

- Mt Canobolas Xanthoparmelia Lichen Community (Endangered)
- White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions (Critically Endangered)
- Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions (Endangered)

EPBC Act:

- White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions (Critically Endangered)

Based on the state vegetation mapping data, a number of turbine locations are within or in close proximity (<100 m) to vegetation communities that could support TECs under the EPBC Act or the BC Act. However, further field vegetation mapping is required to determine the actual presence and extent of TECs at the site, with reference to the following guidelines:

- Australian Government, Department of Environment and Heritage. '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 National Recovery Plan.'
- NSW Government, Environment Climate Change & Water (2010). White Box-Yellow Box Blakely's Red Gum Woodland
- NSW Government, Environment Climate Change & Water (2007). Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions
- NSW Government, Office of Environment & Heritage. 'Mt Canobolas Xanthoparmelia Lichen Community'

BIONET

BioNet records of threatened or conservation significant species within a 10 kilometre radius of the project boundary are detailed below.

BioNet Records of Threatened or Conservation Significant Species

Type	Scientific Name	Common Name	BC Act	EPBC Act	Individuals recorded within 10 km
Birds	*Hieraaetus morphnoides*	Little Eagle	V	-	1
	Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	V	-	1
	Daphoenositta chrysoptera	Varied Sittella	V	-	4
	Petroica boodang	Scarlet Robin	V	-	9
	Petroica phoenicea	Flame Robin	V	-	2
	Ninox strenua	Powerful Owl	V	-	5
	Callocephalon fimbriatum	Gang-gang Cockatoo	V	-	4
Mammals	*Phascolarctos cinereus*	Koala	V	V	1
	Varanus rosenbergi	Rosenberg's Goanna	V	-	1
	Dasyurus maculatus	Spotted-tailed Quoll	V	E	2
	Falsistrellus tasmaniensis	Eastern False Pipistrelle	V	-	9
	Miniopterus orianae oceanensis	Large Bent-winged Bat	V	-	1
Frogs	*Litoria booroolongensis*	Booroolong Frog	E	E	2
Flora	*Diuris aequalis*	Buttercup Doubletail	E	V	12
	Eucalyptus aggregata	Black Gum	V	V	1

Note: V = Vulnerable; E = Endangered; CE = Critically Endangered; Ma = Marine; Mi = Migratory.

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