



Kooyong Battery Energy Storage System

Preliminary Biodiversity Report

PREPARED FOR



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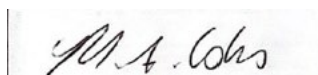
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CONTENTS

EXECUTIVE SUMMARY	1
1. ASSESSMENT OVERVIEW	0
1.1 APPLICABLE LEGISLATION AND POLICIES	0
1.2 THE BIODIVERSITY OFFSETS SCHEME	0
1.3 BIODIVERSITY ASSESSMENT METHOD	1
1.3.1 Changes to the BAM	1
1.4 BIODIVERSITY VALUES NOT ASSESSED	2
1.5 ASSESSMENT DETAILS	2
2. INTRODUCTION	4
2.1 DEVELOPMENT OVERVIEW	4
2.1.1 Subject Land	4
2.1.2 Proposed Development Footprint	4
2.2 METHODS	8
2.2.1 Site Context	8
2.2.2 Native Vegetation Types, Threatened Ecological Communities and Vegetation Integrity	11
2.2.3 Threatened Flora Survey Methods	13
2.2.4 Threatened Fauna Survey Methods	15
2.3 LIKELIHOOD OF OCCURRENCE ASSESSMENT	23
2.4 WEATHER CONDITIONS	23
2.5 LIMITATIONS	24
2.6 LICENSING	24
3. SITE CONTEXT	25
3.1 LANDSCAPE FEATURES	25
3.2 NATIVE VEGETATION COVER AND PATCH SIZE	26
3.2.1 Native vegetation cover	26
3.2.2 Patch Size	27
3.2.3 Land Category Assessment	27
4. NATIVE VEGETATION, THREATENED ECOLOGICAL COMMUNITIES AND VEGETATION INTEGRITY	28
4.1 MAPPING PLANT COMMUNITY TYPES AND ECOLOGICAL COMMUNITIES	28
4.1.1 PCTs within the Subject Land and Footprint	28
4.1.2 Threatened Ecological Communities	35
4.2 SERIOUS AND IRREVERSIBLE IMPACTS (SAII)	40
5. LISTED SPECIES	41
5.1 HABITAT SUITABILITY	41
5.1.1 Predicted Species	41
5.1.2 Candidate Species	43
5.2 HABITAT SURVEYS: CANDIDATE SPECIES	46
5.2.1 Threatened Flora Species	46
5.2.2 Threatened Fauna Species	48
5.3 THREATENED MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE	50
5.4 LISTED MIGRATORY MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE	54

6.	MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE	57
7.	NEXT STEPS	58
7.1	STAGE 1 OF THE BAM	58
7.1.1	Further surveys	58
7.2	STAGE 2 OF THE BAM	58
7.2.1	Application of the Mitigation Hierarchy	59
7.2.2	Offset Strategy	59
8.	REFERENCES	0

APPENDIX A PMST RESULTS

APPENDIX B BAT CALL ANALYSIS

APPENDIX C BAM PLOT DATA

APPENDIX D LIKELIHOOD OF OCCURRENCE

APPENDIX E PREDICTED SPECIES REPORT

APPENDIX F CANDIDATE SPECIES REPORT

LIST OF TABLES

TABLE 1	PCT WITHIN SUBJECT LAND & DEVELOPMENT FOOTPRINT	2
TABLE 1-1	ASSESSMENT DETAILS	2
TABLE 2-1	MINIMUM NUMBER OF PLOTS REQUIRED PER ZONE AREA	12
TABLE 2-2	THREATENED FLORA SURVEY EFFORT	14
TABLE 2-3	THREATENED FAUNA SURVEY	17
TABLE 2-4	LIKELIHOOD OF OCCURRENCE ASSESSMENT	23
TABLE 2-5	WEATHER CONDITIONS	23
TABLE 3-1	SUMMARY OF LANDSCAPE FEATURES	25
TABLE 3-2	AREA OF NATIVE VEGETATION	26
TABLE 4-1	PCTS IDENTIFIED IN THE DEVELOPMENT FOOTPRINT	28
TABLE 4-2	DESCRIPTION OF PCT 3359 NEW ENGLAND HILLS STRINGYBARK-BOX WOODLAND	29
TABLE 4-3	DESCRIPTION OF PCT 3363 WESTERN NEW ENGLAND BLAKELYS RED GUM-BOX GRASSY FOREST	31
TABLE 4-4	THREATENED ECOLOGICAL COMMUNITIES WITHIN THE SUBJECT LAND	36
TABLE 4-5	BC ACT TEC CRITERIA	37
TABLE 4-6	EPBC ACT TEC CRITERIA	38
TABLE 5-1	BAM-C PREDICTED ECOSYSTEM CREDIT SPECIES	41
TABLE 5-2	CANDIDATE SPECIES	44
TABLE 5-3	CANDIDATE FLORA SPECIES SURVEY EFFORT	46
TABLE 5-4	CANDIDATE FAUNA SPECIES SURVEY EFFORT	48
TABLE 5-5	THREATENED SPECIES IDENTIFIED BY THE PMST	50
TABLE 5-6	MIGRATORY SPECIES IDENTIFIED BY THE PMST	54
TABLE 6-1	MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE	57

LIST OF FIGURES

FIGURE 2-1	SUBJECT LAND AND LOCALITY CONTEXT	6
FIGURE 2-2	DEVELOPMENT LAYOUT	7
FIGURE 2-3	DRAFT NATIVE VEGETATION REGULATORY MAP	10
FIGURE 2-4	FLORA SURVEY EFFORT	21
FIGURE 2-5	FAUNA SURVEY EFFORT	22
FIGURE 4-1	PLANT COMMUNITY TYPE MAPPING WITHIN SUBJECT LAND	33
FIGURE 4-2	VEGETATION ZONES WITHIN THE SUBJECT LAND	34
FIGURE 4-3	THREATENED ECOLOGICAL COMMUNITY	39
FIGURE 5-1	NSW BIONET THREATENED SPECIES RECORDS	56

ACRONYMS AND ABBREVIATIONS

Acronym	Description
ACT	Australian Capital Territory
ALA	Atlas of Living Australia
AOBV	Areas of Outstanding Biodiversity Value
ASC	Australian Soil Classification
BAM	Biodiversity Assessment Method
BAM-C	Biodiversity Assessment Method Calculator
BC Act	Biodiversity Conservation Act 2016 (NSW)
BC Regulation	Biodiversity Conservation Regulation 2017 (NSW)
BDAR	Biodiversity Development Assessment Report
BESS	Battery Energy Storage System
BOS	Biodiversity Offsets Scheme
CE	Critically Endangered
cm	centimetre
CPHR	Conservation Programs, Heritage and Regulation
DCCEEW	Department of Climate Change, Energy, the Environment and Water (NSW)
DPHI	Department of Planning, Housing and Infrastructure (NSW)
DPI	Department of Primary Industries (NSW)
DPIE	Department of Planning, Industry and Environment (NSW)
E	Endangered
EAH	Environment Agency Head
EIS	Environmental Impact Statement
EP&A Act	Environmental Planning and Assessment Act 1979 (NSW)
EPA	Environment Protection Authority (NSW)
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)
ERM	Environmental Resources Management Australia Pty Ltd
GIS	Geographic Information System
ha	hectare
HVAC	Heating, ventilation and air-conditioning
IBRA	Interim Biogeographic Regionalisation for Australia
km	kilometre
Koala SATs	Koala Spot Assessment Techniques
kV	kilovolt
LEP	Local Environmental Plan
LGA	Local Government Area

Acronym	Description
LLS Act	Local Land Services Act 2013 (NSW)
m	meter
Mi	Migratory
MNES	Matters of National Environmental Significance
MW	megawatt
MWh	megawatt hour
NSW	New South Wales
NVR	Native Vegetation Regulatory map
PBR	Preliminary Biodiversity Report
PCT	Plant Community Type
PMST	Protected Matters Search Tool
QLD	Queensland
SEARs	Secretary's Environmental Assessment Requirements
SEED	Sharing Enabled Environmental Data Portal (NSW)
SSD	State Significant Development
SVTM	State Vegetation Type Map (NSW)
TBDC	Threatened Biodiversity Data Collection
TEC	Threatened Ecological Community
V	Vulnerable
VIS	Vegetation Integrity Score
VZ	Vegetation Zone

EXECUTIVE SUMMARY

Edify Energy Pty Ltd (the Applicant) proposes to construct and operate the Kooyong Battery Energy Storage System (BESS), a utility-scale battery development located approximately 6 km east of Armidale, NSW (the 'Project'). Environmental Resources Management Australia Pty Ltd (ERM) has prepared this Preliminary Biodiversity Report (PBR) on behalf of the Applicant to assess potential impacts relating to the proposed Project and evaluate biodiversity values present on the Subject Land to assist detailed design development. The Project will involve the construction, operation and decommissioning of a utility scale BESS and associated infrastructure and will require the preparation of a Biodiversity Development Assessment Report (BDAR) as part of the response to the Planning Secretary's Environmental Assessment Requirements (SEARs) anticipated to be provided by the NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW)

The preparation of a BDAR will require completion of Stage 1 and Stage 2 of the BAM and will further address impacts to Threatened Ecological Communities (TECs) and threatened species in accordance with the Biodiversity Assessment Method 2020 (BAM).

The following sections generally outline the future scope of these works.

Stage 1 of the BAM requires that additional survey periods be completed to inform the Project BDAR. The project BDAR will then document the methods and results of these survey efforts and how they adhere to the relevant survey guidelines.

The remaining investigations include the following surveys:

- Site walkover to ensure conditions since the 2022-23 surveys have not changed within Subject Land;
- Additional BAM plot data to further delineate vegetation zones and confirm Vegetation Integrity Score (VIS);
- Review of Candidate Species list following confirmation of Plant Community Type (PCT) mapping; and
- Conduct targeted surveys for updated Candidate Species list (currently only *Caladenia amnicola* has been added since 2023).

Application of Stage 2 of the BAM aims to determine how the Project will meet the "No Net Loss" standard required by the NSW BC Act and support net positive biodiversity outcomes to be delivered as per the *Biodiversity Conservation Amendment (Biodiversity Offsets Scheme) Bill 2024*. This calculation depends on the extent of biodiversity values being impacted, whether the impact is direct, indirect or prescribed. These impacts are to be assessed following application of the mitigation hierarchy (avoid, minimise, mitigate). Therefore, allowing for the quantification of residual impacts. The BAM is then used to calculate the offset liability of the Project in units referred to as biodiversity credits. A biodiversity offset strategy will be defined to demonstrate how this offset is to be delivered, this defines the "No Net Loss" for the proposed Project. This PBR has identified the biodiversity constraints on the proposed Project that will require consideration and application of the mitigation hierarchy.

One TEC was identified with parts of the Subject Land containing native vegetation that conforms with the criteria to form part of the Critically Endangered Ecological Community (CEEC) White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and derived native grassland set out in the BC Act and EPBC Act. Additionally, four (4) threatened species were recorded within the Subject Land during targeted surveys:

- Little Eagle (*Hieraaetus morphnoides*);
- Masked Owl (*Tyto novaehollandiae*);
- Large Bent-winged Bat (*Miniopterus orianae oceanensis*); and
- Southern Myotis (*Myotis macropus*).

No listed flora or migratory fauna species were detected during the field survey.

Native vegetation within the Subject Land and Development Footprint has been assessed as aligning with the BioNet Vegetation Classification PCTs identified within Section 4.

TABLE 1 PCT WITHIN SUBJECT LAND & DEVELOPMENT FOOTPRINT

PCT ID	Condition	Area (ha) in Subject Land	Area (ha) in Development Footprint
3359	Moderate	7.32	5.20
3359	Low	36.22	11.58
3363	Low Woodland	2.39	1.62
0	Planted Native Vegetation	6.39	2.42
0	Exisitng BESS	9.13	3.85

Impacts on native vegetation and threatened species should be avoided as a priority. The following principles are to be considered in the application of the mitigation hierarchy to avoid, minimise and mitigate impacts to TECs and threatened species:

Avoid:

- Areas of mapped TECs;
- Areas that contain identified biodiversity values such as habitat features; and
- Areas of mapped native vegetation.

Minimise:

- The risk for weed and pest incursion on the Subject Land; and
- The risk of injury to fauna.

Mitigate:

- Mitigate any residual impacts to biodiversity. This should be achieved through conservation and improvement of existing native vegetation on the Subject Land.

If deemed to be required, an offset strategy would need to demonstrate a 'no net loss' outcome and may comprise one or more of the following:

- Retirement of suitable ecosystem and species credits registered in the BOS including payment into the Biodiversity Conservation Trust fund;
- Contribution to a conservation initiative; and/or
- Implementation of a voluntary planning agreement (s7.18 of the BC Act).

The Minister may also consider Ancillary Rules in lieu of retiring biodiversity credits as well as any additional and appropriate measures that will minimise those impacts if consent or approval is to be granted for impacts on entities at risk of serious and irreversible impacts (s7.16(3) of the BC Act).

A BDAR prepared in accordance with the BAM is expected to be provided as a part of the EIS and will have regard for the PCTs and BAM-C generated candidate species identified in this PBR, including consideration of serious and irreversible impact (SAII) entities. This is to be used to assess the impact of the Project on assessable biodiversity values. The Project BDAR will comprise the survey methods and results and an assessment of impacts associated with the Project. It will also outline the offset strategy for any residual impacts as a result of the Project.

1. ASSESSMENT OVERVIEW

Edify Energy Pty Ltd (the Applicant) proposes to construct and operate the Kooyong Battery Energy Storage System (BESS), a utility-scale battery development located approximately 6 km east of Armidale, NSW (the 'Project'). The preferred access point for the Project will be via Eathorpe Road, directly off Waterfall Way, approximately 7.5 km by road from Armidale. The Project is a utility-scale battery, with a total capacity of up to 200 megawatt (MW) / 800 megawatt hour (MWh).

Environmental Resources Management Australia Pty Ltd (ERM) has prepared this Preliminary Biodiversity Report (PBR) on behalf of the Applicant. Preliminary biodiversity site investigations were undertaken across an area of 61.45 hectares (ha), which is referred to as the Subject Land. This PBR has been prepared with the purpose of overviewing the Subject Land biodiversity values and providing a foundation for detailed project design and the preparation of a Biodiversity Development Assessment Report (BDAR).

1.1 APPLICABLE LEGISLATION AND POLICIES

The Applicant is seeking State Significant Development (SSD) Consent for the Project under Division 4.7, Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The PBR will support a Scoping Report for the Project, which the Applicant will submit to the Department of Planning, Housing and Infrastructure (DPHI) to request Secretary's Environmental Assessment Requirements (SEARs).

The SEARs will guide the preparation of an Environmental Impact Statement (EIS) for the Project. The Project is deemed state significant development (SSD) and, therefore, Part 7 of the *Biodiversity Conservation Act 2016* (BC Act) applies, and identifies the need to prepare of a BDAR, unless a successful BDAR Waiver is obtained (s7.14 of the BC Act). A BDAR Waiver is not being requested for this Project. Thus, a BDAR completed in accordance with the Department of Planning, Industry and Environment's (DPIE) *Biodiversity Assessment Method 2020* (BAM) will be prepared to accompany Project EIS.

1.2 THE BIODIVERSITY OFFSETS SCHEME

Biodiversity credits are used in the Biodiversity Offsets Scheme (BOS) to resolve residual impacts that a project has on biodiversity values. Biodiversity credits are calculated through the application of the BAM for:

- Unavoidable impacts on biodiversity through the clearing of native vegetation and habitat at the development site; and
- Predicted gain in biodiversity values at a biodiversity stewardship site also known as a conservation area.

This PBR is not a BDAR. The focus of the PBR is to provide a broad characterisation of relevant biodiversity values likely to occur within the Subject Land. A BDAR will be prepared as part of the EIS. The BDAR will be used to determine the number of biodiversity credits required to offset the Project's residual and unavoidable impacts. A biodiversity stewardship site does not form part of this assessment.

1.3 BIODIVERSITY ASSESSMENT METHOD

The BAM is comprised of three stages of assessment. This report considers Stage 1 and Stage 2 of the BAM assessment associated with the preparation of a BDAR. The aspects of Stage 1 of the BAM relevant to the Project are to:

- Establish site context and identify landscape features;
- Assess native vegetation, Threatened Ecological Communities and vegetation integrity;
- Assess habitat suitability for threatened species; and
- Identify prescribed biodiversity impacts.

Stage 2 of the BAM outlines the requirements for assessing impacts on biodiversity values as identified in Stage 1. It follows the mitigation hierarchy principles of avoid, minimise and offset for assessing direct, indirect and prescribed impacts on biodiversity. Stage 2 is also used to determine the number and class of biodiversity credits required to offset any residual impacts to biodiversity that are unavoidable.

1.3.1 CHANGES TO THE BAM

Clause 6.31 of the *Biodiversity Conservation Regulation 2017* outlines how an Accredited Assessor can address changes to the BAM that occur whilst preparing a BDAR for a Project. This Clause is reproduced below for clarity:

6.31 Changes in biodiversity assessment method

(1) If the biodiversity method is changed, a biodiversity assessment report may, during the designated period after the method is changed, be prepared on the basis of the method in force before the change, but only if the report states that it has been prepared on that basis.

(2) For the purposes of this clause, the designated period is—

- (a) except as provided by this subclause—6 months, or*
- (b) in the case of a biodiversity development assessment report in respect of State significant development or State significant infrastructure—12 months, or*
- (c) in the case of a biodiversity certification assessment report for an application that is not a strategic biodiversity certification application—12 months, or*
- (d) in the case of a biodiversity certification assessment report for a strategic biodiversity certification application—12 months or such longer period as the Minister approves in a particular case.*

The BAM refers to the Threatened Biodiversity Data Collection (TBDC) and NSW BioNet Atlas as resources that *must* be used in preparing a BDAR. A change in the content of these resources has the effect of changing the BAM when preparing a BDAR. Thus, such changes during the preparation of a BDAR for this Project after the date of this PBR may be interpreted as a change to the BAM. On this basis, and with reference to the specified designated periods above, the Accredited Assessor may prepare the BDAR on the basis of the methods in force before the change and in so doing will state this as the case in the BDAR.

This assessment contains site-based information suitable for determining the PCTs present within the Subject Land, which thus provides a sound basis for the generation of the 'candidate species' applicable to the Project. Changes in the 'candidate species' list after the publishing of this assessment may represent a change in the BAM for the BDAR in preparation and, for this reason, these additional species may be excluded from the assessment. The BDAR will state this if the circumstance arises.

A change to survey methods for 'candidate species' specified in the TBDC during the preparation of the BDAR is also interpreted as a change to the BAM. The Accredited Assessor may choose to apply the survey methods in force before the change and, if so, the decision to do so will be stated in the BDAR.

1.4 BIODIVERSITY VALUES NOT ASSESSED

The BAM does not assess the following biodiversity values; therefore, these have been excluded from the PBR:

- Marine mammals;
- Wandering seabirds;
- Biodiversity that is endemic to Lord Howe Island; and
- Native vegetation and loss of habitat on category 1-exempt land (within the meaning of Part 5A of the *Local Land Services Act 2013* [LLS Act]), other than the additional biodiversity impacts under clause 6.1 of the BC Regulation (referred to as prescribed impacts in the BAM).

A statewide draft Native Vegetation Regulatory (NVR) map is available for review as of March 2024. The NVR map identifies both Category 1 and Category 2 Land occurring within the Subject Land. Site surveys completed aimed to verify/amend this map in preparation for the BDAR.

1.5 ASSESSMENT DETAILS

Table 1-1 below outlines the assessment details required by the BAM assessment.

TABLE 1-1 ASSESSMENT DETAILS

Subject	Details	
Proponent	Edify Energy Pty Ltd	
Application Type	Development Assessment	
Accredited Assessor	Ashleigh McTackett (ashleigh.mctackett@erm.com)	
Application reference	Parent case number	00057422
	Application Case Number	00057422/BAAS20028/25/00057423
Property Address	112 Eathorpe Road, Armidale, NSW 2350	
Subject Land area (hectares)	61.45	
Local government area (LGA)	Armidale Regional Council	
Title reference	Lot	DP

Subject	Details	
	<i>Freehold – BESS Location</i>	
	842	755808
	<i>Transgrid Land (containing easement and substation)</i>	
	847	653684
	858	755808
	1, 2	999496
	8	112694
	1	1013556

2. INTRODUCTION

This PBR has been prepared on behalf of the Applicant to provide a preliminary assessment of the Subject Land aligned with current biodiversity legislation and BAM 2020. The PBR provides an overview of the biodiversity values across the Subject Land according to current biodiversity database information available and provides a foundation to support detailed project design to be assessed under a BDAR. This report presents data from previous field surveys that focused on the mapping of PCTs and the identification of associated threatened species and ecological community constraints across Subject Land. Additionally, this report outlines future survey and assessment requirements, with an approach to addressing residual impacts.

2.1 DEVELOPMENT OVERVIEW

The Project is located at 112 Eathorpe Road, Armidale, and is approximately 6 km east of Armidale, NSW. The preferred access point for the Project will be via Eathorpe Road, directly off Waterfall Way, approximately 7.5 km by road from Armidale. The Project is located within the Armidale Regional Council local government area (LGA) and is located on land that is primarily used for agricultural purposes, adjacent to the existing Armidale Transgrid Substation.

Under the Armidale Regional Local Environmental Plan (2012), the southern portion of the Subject Land is zoned as RU4 Primary Production Small Lots covering one (1) land parcel and a Local Government Authority Road (unbuilt). The northern portion is zoned SP2 Infrastructure covering the remaining six land parcels and Crown Land Paper Roads.

The Project locality and regional setting is depicted in **Figure 2-1**.

2.1.1 SUBJECT LAND

The Subject Land shown in **Figure 2-1** equates to the Project Area, and is inclusive of Lot 842/DP755808, where the proposed BESS will be situated. The Subject Land also includes:

- Existing Armidale Transgrid 132/330 kV substation (Armidale substation);
- Associated existing transmission lines;
- Local Government Authority Road parcel (where site access meets Eathorpe Rd);
- Roadside vegetation along Eathorpe Rd and Waterfall Way (clearing may be required for access/traffic purposes), and
- The gazetted road, which runs east-west between Lot 842 and the Transgrid land.

The Project design has been altered since the surveys were completed in 2022 with the Subject Land no longer including Lot 841 of DP755808. The Subject Land consists predominately of agricultural land and is 998.16 m above sea level.

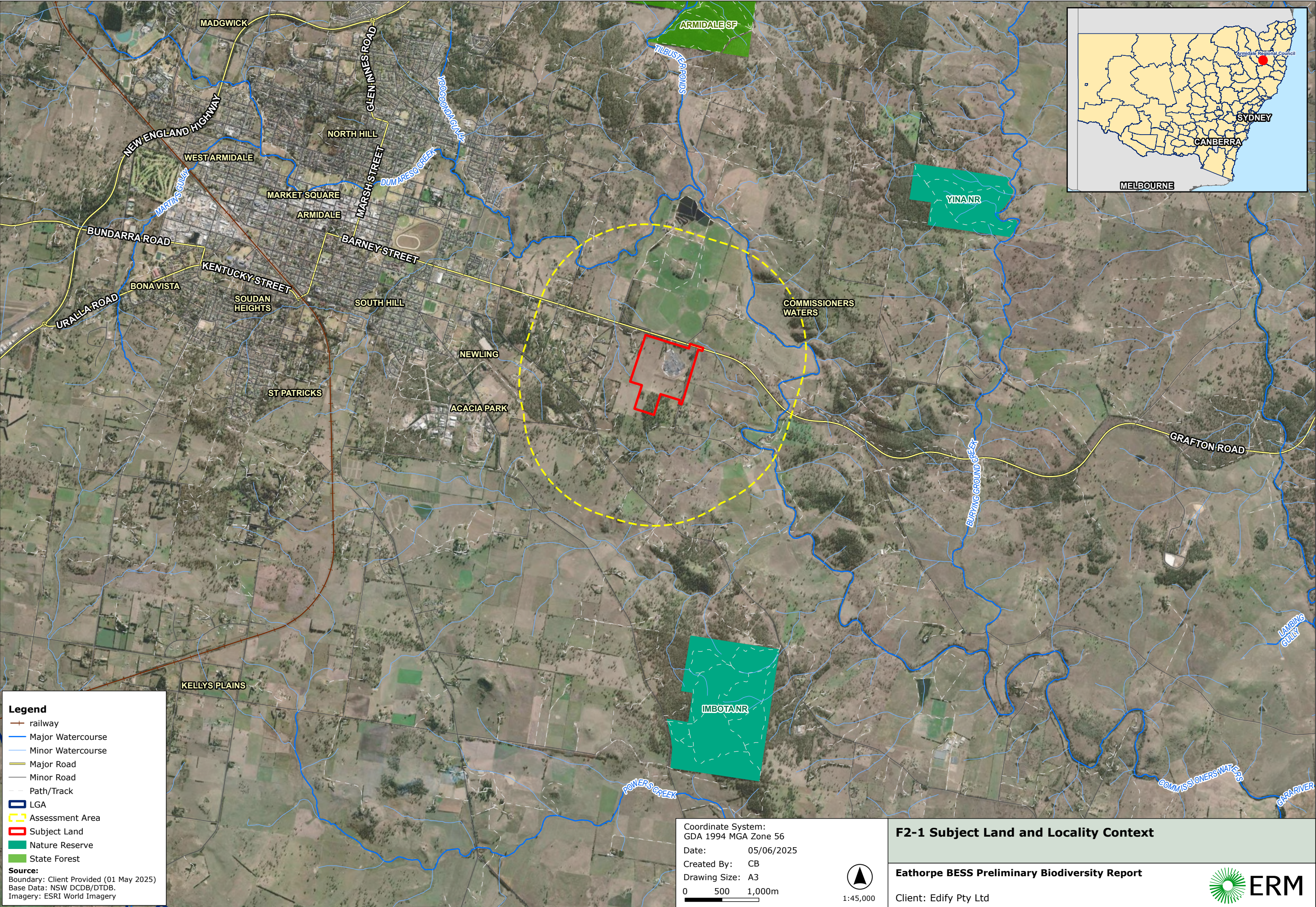
2.1.2 PROPOSED DEVELOPMENT FOOTPRINT

The Project will involve the construction, operation and decommissioning of a utility scale BESS and associated infrastructure. The BESS will have a total capacity of 200 MW / 800 MWh and will be located directly south of the existing Transgrid Armidale 132/330 kV substation. Edify is proposing to build a new transmission line that will connect to this substation, subject to agreement with Transgrid.

Detailed design of the Project by a suitably qualified BESS technology provider has not yet been determined, and therefore the Project will be subject to continuous refinement and modification. A BESS substation will be established within the site to convert electricity between BESS compound and the 132/330 kV transmission network. This substation will consist of:

- Concrete or compacted gravel pad;
- Transformer bays;
- A series of enclosed batteries with associated integrated elements, mounted on compacted gravel or a concrete slab;
- Battery enclosures will be arranged in rows and will contain:
 - Racks/groups of battery cells;
 - Inverters;
 - Associated temperature control systems for cooling and heating;
 - Containerised ventilation;
 - Air conditioning (HVAC) units;
- The BESS will also require the following ancillary infrastructure:
 - Electrical switch rooms;
 - An office building and control room with associated parking for workers and visitors;
 - Utilities connections (e.g., telecom, sewerage, water, etc.);
 - Drainage and stormwater management systems;
 - Lighting and security cameras;
 - Security fencing;
 - Noise walls, landscaping and screening vegetation; and
 - Fire-fighting equipment including water tank/s.

The conceptual layout for this Project is depicted in **Figure 2-2**, although the Project is subject to detailed design and therefore aspects (such as the siting of Project elements and construction methodology) are subject to change. Regardless, all works will remain within the defined Development Footprint as shown in **Figure 2-2**, and include the proposed transmission easement corridor and site access road. The design will be located to avoid and minimise impacts on biodiversity values, as informed by the outcomes of this PBR.



Legend

railway

Major Watercourse

Minor Watercourse

Major Road

Minor Road

Path/Track

LGA

Assessment Area

Subject Land

Nature Reserve

State Forest

Source:
Boundary: Client Provided (01 May 2025)
Base Data: NSW DCDB/DTDB.
Imagery: ESRI World Imagery

Coordinate System:
GDA 1994 MGA Zone 56

Date:
05/06/2025

Created By:
CB

Drawing Size:
A3

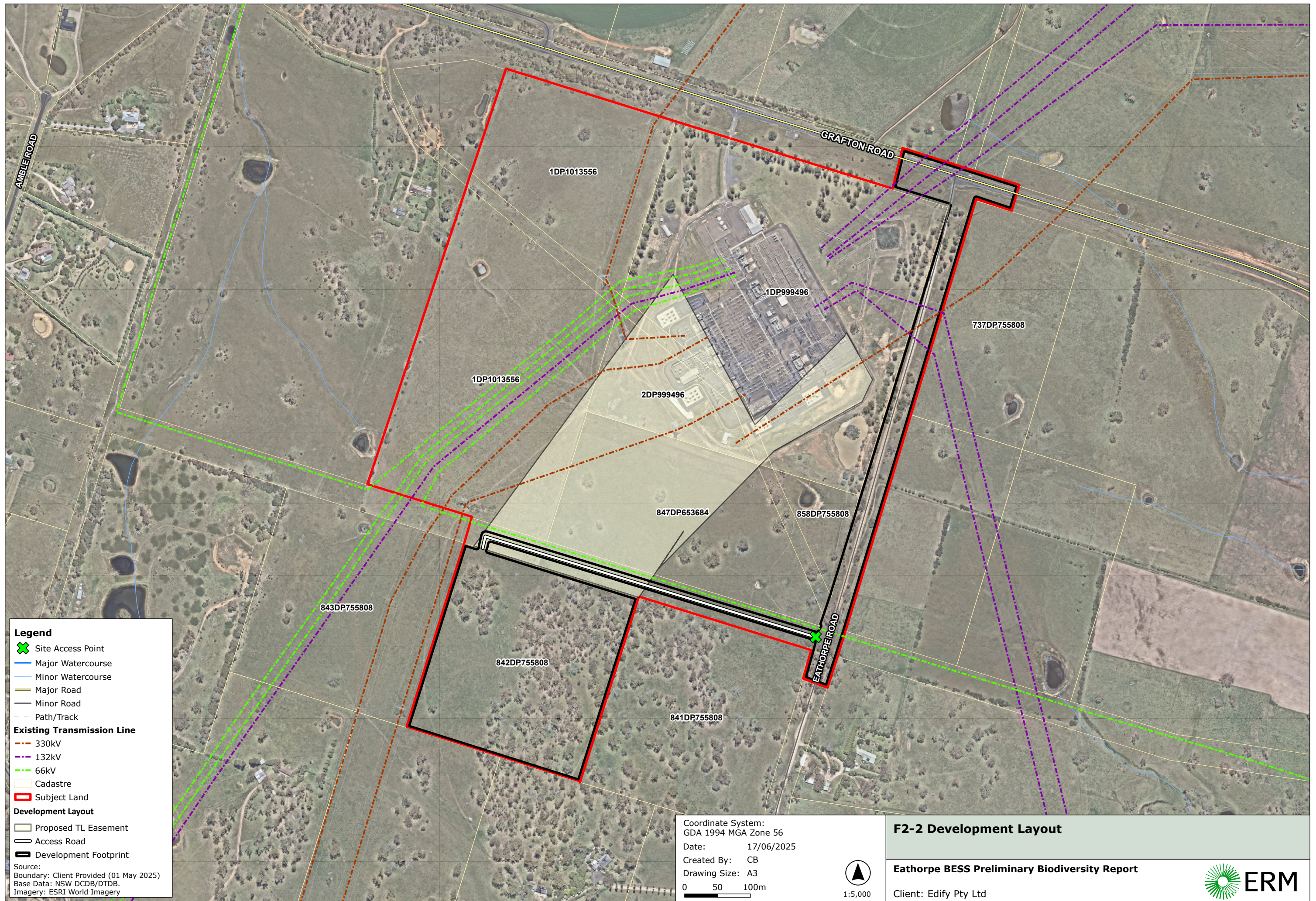
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F2-1 Subject Land and Locality Context

Eathorpe BESS Preliminary Biodiversity Report

Client: Edify Pty Ltd



2.2 METHODS

This PBR identifies and describes significant biodiversity values within the Subject Land and provides preliminary recommendations in terms of avoidance, mitigation and/or additional assessment required as part of the design development and EIS phases of the Project. A combination of desktop and field methods were used in the preparation of this report.

2.2.1 SITE CONTEXT

2.2.1.1 ASSESSMENT AREA

The Assessment Area was determined in accordance with Section 3.2 of the BAM. The Assessment Area for a non-linear development is defined as a 1,500 m buffer applied to the Subject Land. The Assessment Area provides an overview of surrounding landscape features and informs the BAM-C in predicting threatened species relevant to the assessment.

2.2.1.2 LANDSCAPE FEATURES

Landscape features were identified for the Assessment Area and Subject Land through desktop review and confirmed through field investigations. The following has been identified in accordance with the BAM 2020:

- IBRA regions and subregions;
- Native vegetation extent and cleared areas within the Project Area (in ha);
- River, streams, estuaries, wetlands and other waterbodies;
- Connectivity features; and
- Areas of geological significance and soil hazard.

The following databases and publicly available resources were reviewed as a part of this assessment:

- Online TBDC, including NSW BioNet Atlas, Vegetation Information System Database and threatened biodiversity profiles;
- Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) Protected Matters Search Tool (PMST) to identify Matters of National Environmental Significance (MNES), with the potential to occur within the locality of the Project Area. (Accessed 7 May 2025, provided in **Section 5.3** and **Appendix A**);
- NSW Sharing Enabled Environmental Data (SEED) Portal to identify Mitchell Landscapes, hydrology mapping and IBRA version 7 mapping;
- NSW eSPADE Soils and Land Mapping;
- Australian Soil Classification (ASC) soil type map of NSW version 4.5;
- NSW Department of Primary Industries (DPI) Fisheries key fish habitat mapping; and
- Atlas of Living Australia database.

Observations made during the initial site visits were used to verify the desktop review findings where applicable, with future surveys to be completed in accordance with the BAM.

2.2.1.3 LAND CATEGORISATION

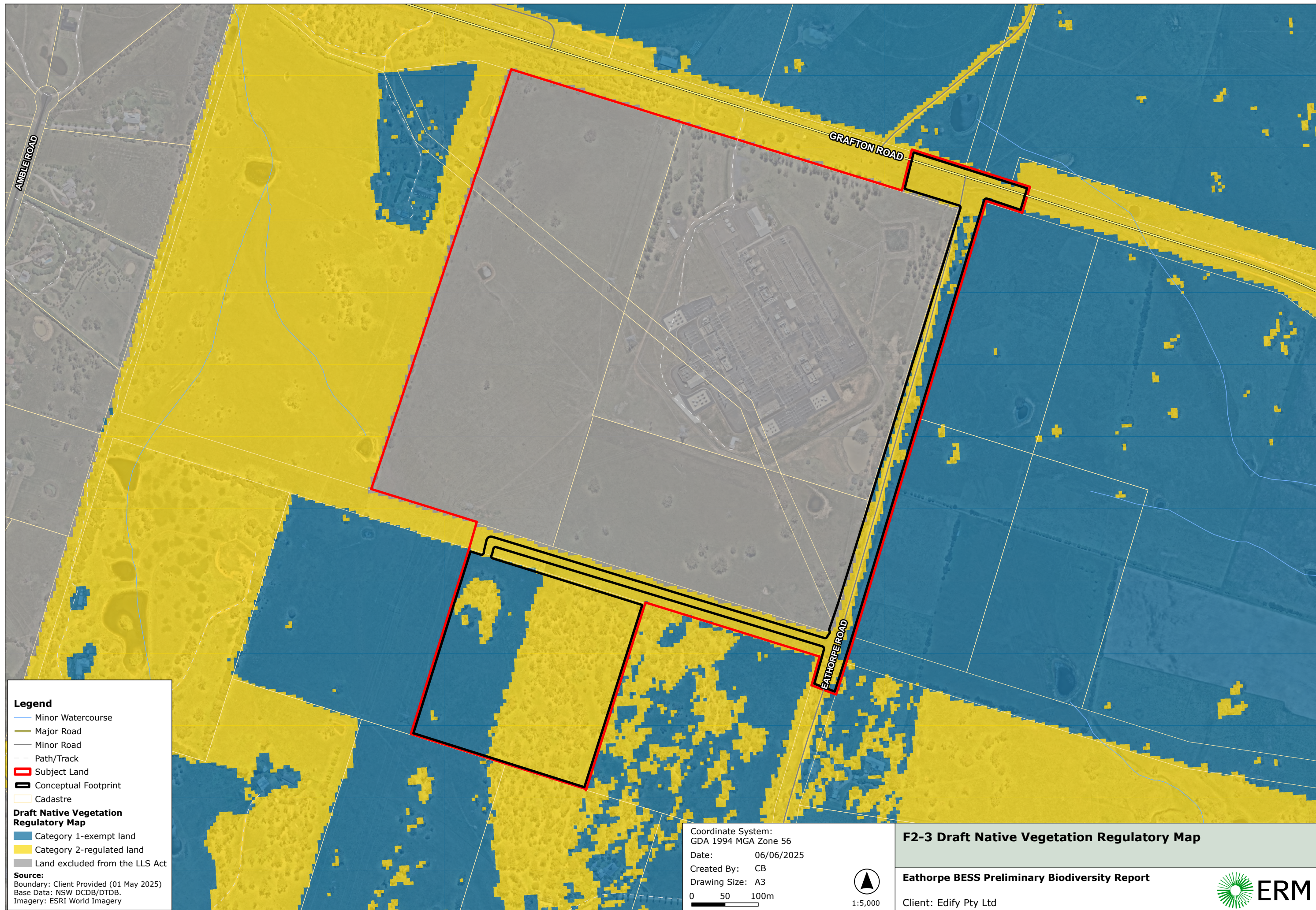
Under the LLS Act, land is categorised as either:

- Category 1 – Exempt Land; or
- Category 2 – Regulated Land.

The criterion for classifying these lands is provided in Section 60 I of the LLS Act.

Land categorisation for the Subject Land was reviewed as part of this PBR using the draft NVR map (updated 2 May 2025), which is shown in **Figure 2-3**.

When preparing the BDAR, the draft NVR map will be reviewed again using guidance provided in *Determining native vegetation land categorisation for application in the Biodiversity Offsets Scheme* (DPIE, 2023). Any proposed variations to the draft NVR map will be evidence-based and determined through consultation with the NSW Conservation Programs, Heritage and Regulation group (CPHR).



2.2.2 NATIVE VEGETATION TYPES, THREATENED ECOLOGICAL COMMUNITIES AND VEGETATION INTEGRITY

2.2.2.1 EXISTING INFORMATION

A desktop review was conducted to determine the initial extent of native vegetation on site and to identify potential PCTs and TECs that are likely to occur on the Subject Land, as derived from the desktop analysis.

The following resources were reviewed:

- The NSW State Vegetation Type Map (SVTM) C2.0M2.0 (November 2024);
- PMST, accessed 5 May 2025;
- Online TBDC, including the vegetation information system; and
- BAM 2020 – to determine required plot data requirements.

2.2.2.2 MAPPING NATIVE VEGETATION EXTENT

The above resources were used to inform mapping and the extent of native vegetation on the Subject Land. Mapping of vegetation on site was refined following field surveys to ground-truth vegetation mapping. Field surveys to confirm the vegetation mapping and extent were conducted across the Subject Land over the following dates:

- 13 to 16 June 2022;
- 25 to 27 October 2022; and
- 16 to 20 January 2023.

The vegetation on site was evaluated through rapid vegetation assessments and vegetation integrity plots (BAM plots) to determine likely PCTs and TECs present, and the initial extent of PCTs. Survey locations undertaken are presented in **Figure 2-4**.

Additional BAM plot sampling may be required to be completed in accordance with the BAM as part of the BDAR preparation to refine PCT mapping and to inform an EIS submission.

Rapid Vegetation Assessments

Rapid vegetation assessments were conducted throughout the Subject Land to gather high level information on vegetation composition and structure, dominant flora species and note features of interest, to compliment-vegetation mapping. During field surveys, twenty-two (22) rapid vegetation assessments were completed. These are mapped in **Figure 2-4**.

Vegetation Integrity Plots (BAM plots)

BAM plots are required in accordance with section 4.2.1 of the BAM to identify the most likely PCTs on the Subject Land. BAM plots are used to calculate the Vegetation Integrity (VI) score of a PCT. They also assist in determining whether the PCT may be associated with a TEC.

Plots were completed in accordance with the BAM requirements and consisted of establishing survey plots around a central 50 m midline (transect), including:

- One 400 m² plot (standard 20 m x 20 m);
- One 1000 m² plot (standard 20 m x 50 m); and
- Five 1 m² subplots.

Data collection within each BAM plot included:

- Identification of all flora species present within the plot area;
- Collection of composition and structure attributes, including stratum and layers in which all species occur, growth form of species; abundance rating for each species; percent cover of growth forms;
- Collection of function attributes, including the number of large trees, hollow bearing trees, stem size classes, tree regeneration, length of logs and high threat weed cover;
- Five subplots to assess average litter cover, bare earth, cryptogram and rock cover; and
- One 1000 m² (20 m by 50 m) plot to assess the function attributes (number of hollow bearing trees, stem size class, tree regeneration and length of logs).

A total of ten (10) BAM plots were completed on or adjacent to the Subject Land during field surveys. All BAM plots were recorded using GIS software and given unique identification for ease of assessment. The location of BAM plots completed to date are shown in **Figure 2-4**.

Vegetation Zones

A Vegetation Zone (VZ) is a relatively homogenous area of native vegetation that is the same PCT and has the same broad condition state (DPIE, 2020). VZs were determined in conjunction with the delineation of PCT presence and extent across the Subject Land. VZs were defined using data collected during field surveys across June 2022, October 2022 and January 2023.

Table 2-1 provides an overview of VZs identified across the Subject Land and summarises the minimum number of BAM plots required per zone within the Development Footprint in accordance with Table 3 of the BAM.

TABLE 2-1 MINIMUM NUMBER OF PLOTS REQUIRED PER ZONE AREA

VZ ID	PCT ID	Condition	Area (ha) in Subject Land	Area (ha) in Development Footprint	No. BAM plots required	No. BAM plots completed	BAM Plot IDs
VZ1	3359	Moderate	7.32	5.2	2	5	BAM01, BAM02, BAM03, BAM05, BAM06
VZ2	3359	Low	36.22	11.58	3	3	BAM04, BAM07, BAM13
VZ3	3363	Low Woodland	2.39	1.62	1	2	BAM12, SUMBA M03
VZ4	0	Planted Native Vegetation	6.39	2.41	0	0	-
VZ5	0	Existing Substation	9.13	3.85	0	0	-

2.2.3 THREATENED FLORA SURVEY METHODS

2.2.3.1 EXISTING INFORMATION

The following databases were reviewed prior to flora surveys being conducted for this PBR:

- BAM-C list of ecosystem and candidate species for each PCT on site;
- BioNet Atlas Database (NSW DCCEEW, 2025b); and
- Atlas of Living Australia (ALA) (CSIRO, 2025).

A list of potential threatened flora species was generated from the above resources to support threatened flora species surveys on the Subject Land for this PBR. Existing records on the Subject Land and records within the Assessment Area were further investigated and considered as part of this PBR.

2.2.3.2 HABITAT CONSTRAINTS ASSESSMENT

Desktop review and field surveys within the Subject Land included the assessment of habitat constraints and microhabitats, and their suitability for predicted (ecosystem) species credit flora species.

2.2.3.3 FIELD SURVEYS

The BAM-C identifies candidate species that require seasonal targeted searches to be undertaken across the Subject Land in accordance with the BAM and relevant guidelines.

Under s5.2.2 of the BAM, candidate species can be excluded from further assessment if the assessor considered that the species is unlikely to occur on the Subject Land or within the VZ. No species-specific habitat constraints are considered present within the Subject Land. Therefore, no threatened flora species were excluded from assessment. Furthermore, under s5.2.3 of the BAM, a candidate species credit species can be considered unlikely to occur on the Subject Land (or within specific VZs) if after carrying out a field assessment, the assessor determines that the habitat is substantially degraded such that the species is unlikely to utilise the Subject Land (or specific VZs).

A desktop analysis identified seven (7) candidate flora species to be considered and determined likely to have potential habitat on the Subject Land. Candidate species considered to have potential habitat on site are presented in **Table 2-2**.

Targeted surveys were undertaken on the Subject Land for candidate flora species determined to require further assessment under the BAM-C. Surveys were undertaken over:

- 25 to 27 October 2022; and
- 16 to 20 January 2023.

Survey effort for each threatened flora species is presented in **Table 2-2** and **Figure 2-4**.

TABLE 2-2 THREATENED FLORA SURVEY EFFORT

Common name	Scientific name	Timing/effort	Guidelines	Present
-	<i>Callistemon pungens</i>	October 2022 - Targeted threatened flora transect undertaken within areas of PCT 3359 and PCT 3363. 2 people walking in parallel at 5 m apart for 15 minutes in each survey location. Representing 4.5 survey hours. January 2023 - Targeted threatened flora transect undertaken within areas of PCT 3359 and 3363. 2 people walking in parallel at 5 m apart. Representing 6.5 survey hours.	Surveying Threatened Plants and Their Habitats (DPIE, 2020b)	No
Bluegrass	<i>Dichanthium setosum</i>	October 2022 - Targeted threatened flora transect undertaken within areas of PCT 3359 and PCT 3363. 2 people walking in parallel at 5 m apart for 15 minutes in each survey location. Representing 4.5 survey hours. January 2023 - Targeted threatened flora transect undertaken within areas of PCT 3359 and 3363. 2 people walking in parallel at 5 m apart. Representing 6.5 survey hours.	Surveying Threatened Plants and Their Habitats (DPIE, 2020b)	No
Northern Blue Box	<i>Eucalyptus magnificata</i>	October 2022 - Targeted threatened flora transect undertaken within areas of PCT 3359 and PCT 3363. 2 people walking in parallel at 5 m apart for 15 minutes in each survey location. Representing 4.5 survey hours. January 2023 - Targeted threatened flora transect undertaken within areas of PCT 3359 and 3363. 2 people walking in parallel at 5 m apart. Representing 6.5 survey hours.	Surveying Threatened Plants and Their Habitats (DPIE, 2020b)	No
Narrow-leaved Black Peppermint	<i>Eucalyptus nicholii</i>	October 2022 - Targeted threatened flora transect undertaken within areas of PCT 3359 and PCT 3363. 2 people walking in parallel at 5 m apart for 15 minutes in each survey location. Representing 4.5 survey hours. January 2023 - Targeted threatened flora transect undertaken within areas of PCT 3359 and 3363. 2 people walking in parallel at 5 m apart. Representing 6.5 survey hours.	Surveying Threatened Plants and Their Habitats (DPIE, 2020b)	No

Common name	Scientific name	Timing/effort	Guidelines	Present
Tall Velvet Sea-berry	<i>Haloragis exalata subsp. velutina</i>	October 2022 - Targeted threatened flora transect undertaken within areas of PCT 3359 and PCT 3363. 2 people walking in parallel at 5 m apart for 15 minutes in each survey location. Representing 4.5 survey hours. January 2023 - Targeted threatened flora transect undertaken within areas of PCT 3359 and 3363. 2 people walking in parallel at 5 m apart. Representing 6.5 survey hours.	Surveying Threatened Plants and Their Habitats (DPIE, 2020b)	No
Silky Swainson-pea	<i>Swainsona sericea</i>	October 2022 - Targeted threatened flora transect undertaken within areas of PCT 3359 and PCT 3363. 2 people walking in parallel at 5 m apart for 15 minutes in each survey location. Representing 4.5 survey hours. January 2023 - Targeted threatened flora transect undertaken within areas of PCT 3359 and 3363. 2 people walking in parallel at 5 m apart. Representing 6.5 survey hours.	Surveying Threatened Plants and Their Habitats (DPIE, 2020b)	No
Austral Toadflax	<i>Thesium australe</i>	October 2022 - Targeted threatened flora transect undertaken within areas of PCT 3359 and PCT 3363. 2 people walking in parallel at 5 m apart for 15 minutes in each survey location. Representing 4.5 survey hours. January 2023 - Targeted threatened flora transect undertaken within areas of PCT 3359 and 3363. 2 people walking in parallel at 5 m apart. Representing 6.5 survey hours.	Surveying Threatened Plants and Their Habitats (DPIE, 2020b)	No

2.2.4 THREATENED FAUNA SURVEY METHODS

2.2.4.1 REVIEW OF EXISTING INFORMATION

The following databases were reviewed prior to fauna surveys being conducted for this PBR:

- BAM-C list of ecosystem and candidate species for each PCT on site;
- BioNet Atlas Database (NSW DCCEEW, 2025b); and
- Atlas of Living Australia (ALA) (CSIRO, 2025).

A list of potential threatened fauna species was generated from the above resources to support threatened fauna species surveys on the Subject Land for this PBR. Existing records on the Subject Land and records within the Assessment Area were further investigated and considered as part of this PBR.

Fourteen (14) candidate fauna species were identified through desktop analysis to have potential habitat within the Subject Land and require targeted survey. A list of candidate fauna species considered to require targeted survey is available in **Table 2-3**.

2.2.4.2 HABITAT CONSTRAINTS ASSESSMENT

Desktop analysis and field surveys within the Subject Land included assessment of habitat constraints and microhabitats, and their suitability for threatened fauna species. This included desktop assessment of the Assessment Area for features such as caves and waterways, and field inspection of microhabitats including leaf litter, stick nests and hollow-bearing trees within the Subject Land.

2.2.4.3 FIELD SURVEYS

ERM conducted targeted fauna surveys across the Subject Land for the 14 candidate fauna species considered to have potential habitat on site during three survey events:

- 13 to 16 June 2022;
- 25th to 28 October 2022; and
- 16 to 20 January 2023.

The field surveys involved the following methods summarised below and shown on **Figure 2-5**:

- A general habitat assessment, noting the abundance of various habitat features as well as an assessment of the likelihood of occurrence of potentially occurring threatened fauna species. This included searches for tree hollows, roosts, fallen logs, bush rocks, caves and crevices, manmade structures, riparian areas, wetlands and waterbodies;
- Nocturnal spotlighting incorporating call playback targeting nocturnal reptiles, mammals and birds;
- Microchiroptera bat surveys, including the installation of one recording device for ultrasonic call detection;
- Aural-visual surveys targeting amphibian species;
- Koala Spot Assessment Techniques (Koala SATs);
- Installation of a camera trap targeting arboreal mammal species;
- Bird surveys, including visual observations and call identification; and
- Incidental observations.

Any incidental fauna species, particularly avifauna species, that were observed, heard calling, or otherwise detected based on tracks or signs, were recorded and listed in the total species list for the Subject Land. Furthermore, the locations of any specific habitat features, in particular hollow-bearing trees and raptor nests, incidentally, sighted outside of the habitat assessment locations were also recorded.

Effort undertaken for each candidate species is presented in **Table 2-3**.

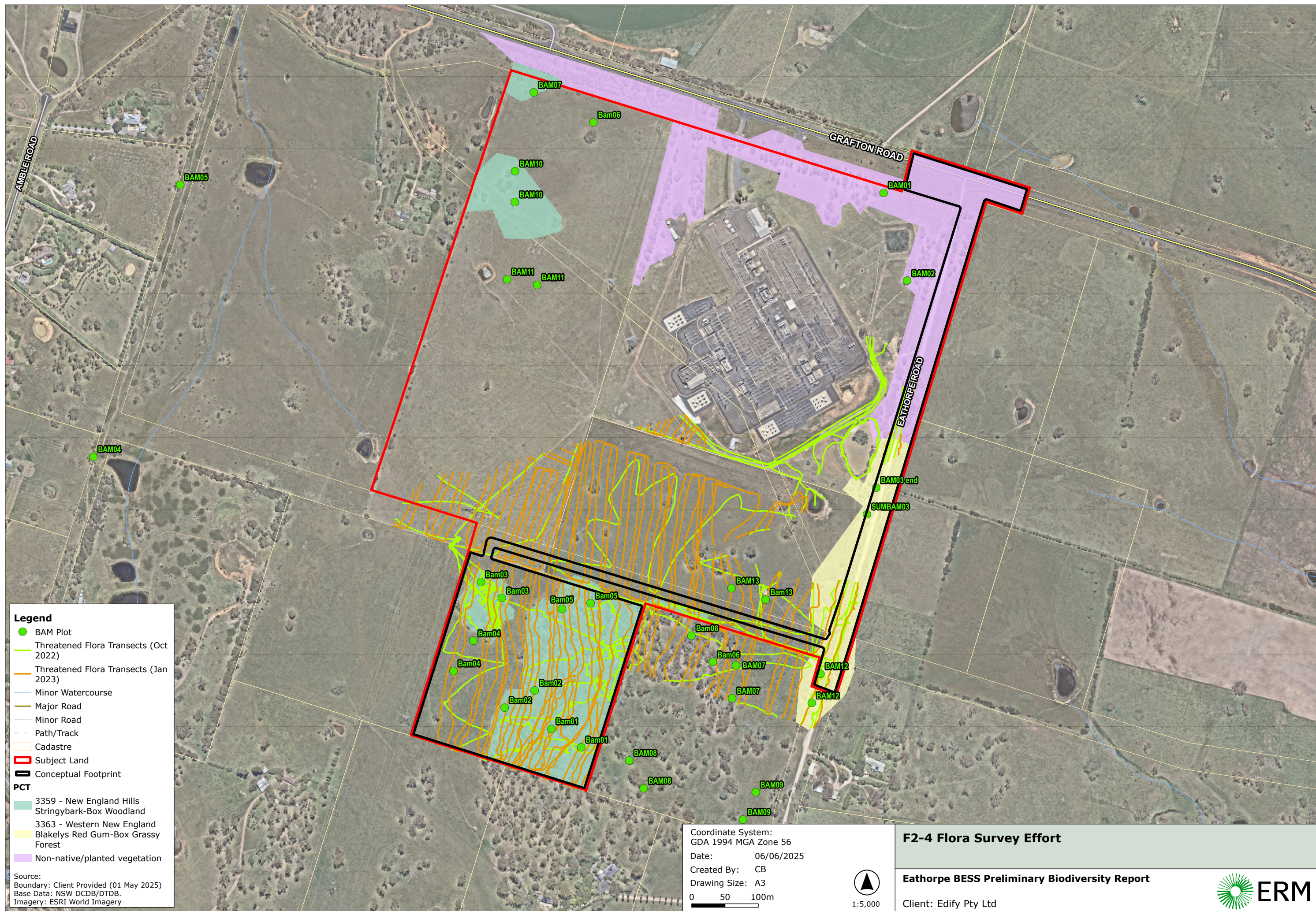
TABLE 2-3 THREATENED FAUNA SURVEY

Common name	Scientific name	Survey method and effort	Guidelines	Present
Tusked Frog population in the Nandewar and New England Tableland Bioregions	<i>Adelotus brevis</i> - <i>endangered population</i>	Nocturnal aural-visual amphibian surveys were undertaken across two disturbed farm dam sites. Potential habitat transects of 100 m (Dam 01) and 210 m (Dam 02) were completed by 2 people for approximately 30 minutes per site, with intermittent call playback of Tusked Frogs calls. Surveys were undertaken over 2 nights, 25th and 26th October 2022, and a further 2 nights, 16th and 17th January 2023. Survey effort represented 8 person hours.	NSW Survey Guide for Threatened Frogs (DPIE, 2020c)	No
Peppered Tree Frog	<i>Litoria piperata</i>			No
Bush Stone-curlew	<i>Burhinus grallarius</i>	Nocturnal spotlighting and call playback were undertaken for this species at 2 sites between 13th-16th June 2022. Habitat for the Bush-stone curlew was limited on site, as grazing and disturbance is prominent. In areas with fallen timber, species calls were played for 30 seconds followed by 4.5 minutes listening time. This was undertaken by 2 people and the sequence repeated 3 times per site.	Threatened Biodiversity Survey and Assessment – Guidelines for Developments and Activities (DEC, 2004)	No
Glossy Black-Cockatoo (Breeding)	<i>Calyptorhynchus lathami</i>	During initial field survey, June 2022, opportunistic searches for suitable foraging habitat (casuarina and Allocasuarina) and potential breeding habitat, hollows of 15 cm diameter or greater, were undertaken via random meanders across the site. Bird observations (Calls, sightings and foraging signs) were noted opportunistically whilst undertaking all survey effort across the three survey events.	Survey guidelines for Australia's threatened birds (DEWHA, 2010)	No

Common name	Scientific name	Survey method and effort	Guidelines	Present
White-bellied Sea-Eagle (Breeding)	<i>Haliaeetus leucogaster</i>	Stick nest and signs of raptor occupancy searches were completed across the Subject Land. These searches were conducted opportunistically whilst conducting other targeted surveys, including threatened flora transects, hollow bearing tree searches, and BAM Plot surveys.	Threatened Biodiversity Survey and Assessment – Guidelines for Developments and Activities (DEC, 2004)	No
Little Eagle (Breeding)	<i>Hieraaetus morphnoides</i>			Yes
Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	An ultrasonic call monitoring device (Titley Chorus) was deployed to record bat calls from sunset to dawn. This device was deployed between 16th – 20th January 2023, and positioned within the woodland vegetation, placed 2 m above ground, and oriented upwards towards an apparent flight path. Anabat call analysis was completed by GreenTape Solutions and results are provided in Appendix B.	'Species credit' threatened bats and their habitats NSW survey guide for the Biodiversity Assessment Method (OEH, 2018)	No
Large Bent-winged Bat	<i>Miniopterus orianae oceanensis</i>			Yes (probable)
Southern Myotis	<i>Myotis macropus</i>			Yes (possible)
Eastern Pygmy-possum	<i>Cercartetus nanus</i>	Nocturnal spotlighting transects and call playback surveys were undertaken across four nights by two ecologists. The site was surveyed on the nights of 25th and 26th October 2022, and again on the nights of 16th and 17th January 2023. Transects were undertaken on foot with the use of handheld	Threatened biodiversity survey and assessment guidelines (DEC, 2004)	No

Common name	Scientific name	Survey method and effort	Guidelines	Present
Squirrel Glider	<i>Petaurus norfolcensis</i>	torches. In two locations on each night, the calls of target species were played using a 17W amplifier. At each call playback location, the following sequence was used: 10 minutes listening, intermittent calls of each species, 10 minutes of listening, followed by 20 minutes of spotlighting. Camera traps were deployed for four nights between 16th – 20th January 2023. These were baited with a mixture of peanut butter, honey and oats.		No
Koala	<i>Phascolarctos cinereus</i>	Nocturnal spotlighting and call playback was undertaken across four nights by two ecologists, concurrently with Glider and Possum surveys. Two sites were surveyed on the nights of 25th and 26th October 2022, and two sites were surveyed on the nights of 16th and 17th January 2023. Total survey effort of 16 person hours. Targeted Koala scat surveys were undertaken at 4 locations between 25th October – 27th October 2022, with additional scat searches undertaken opportunistically across the site. Camera traps were deployed for four nights between 16th – 20th January 2023.	The Spot Assessment Technique: A tool for determining localised levels of habitat use by Koalas <i>Phascolarctos cinereus</i> (Phillips & Callaghan, 2011) Koala (<i>Phascolarctos cinereus</i>) Biodiversity Assessment Method Survey Guide (NSW DPE, 2022);	No
Masked owl (Breeding)	<i>Tyto novaehollandiae</i>	During initial field survey, June 2022, opportunistic hollow searches were completed across the site to determine presence of hollows of 20 cm diameter or greater. Eight (8) hollows were identified within the Subject Land, as shown in Figure 2-5. Of the eight (8) HBTs identified within the Subject Land, only two (2) HBTs were considered to	Threatened biodiversity survey and assessment guidelines (DEC, 2004)	No

Common name	Scientific name	Survey method and effort	Guidelines	Present
Barking owl (Breeding)	<i>Ninox connivens</i>	offer potential breeding habitat for Forest Owls (hollows <20cm and >4m). Both HBTs were surveyed. The Barking Owl and Masked Owl were then surveyed using initial stag watches of potential breeding hollows (2 nights at each site), then call playback and spotlighting effort was undertaken at each site across four calm nights in winter 2022 (13th – 16th June 2022). The following sequence was used: 20 minutes of stag watching prior to sunset. At each site, call playback was undertaken using intermittent calls of each species for 5 minutes, 10 minutes of listening, followed by 15 minutes of spotlighting. Calls of target species were played using a 17W amplifier and represents 11 person hours.		Yes



Legend

- BAM Plot
- Threatened Flora Transects (Oct 2022)
- Threatened Flora Transects (Jan 2023)
- Minor Watercourse
- Major Road
- Minor Road
- Path/Track
- Cadastre
- Subject Land
- Conceptual Footprint

PCT

- 3359 - New England Hills Stringybark-Box Woodland
- 3363 - Western New England Blakelys Red Gum-Box Grassy Forest
- Non-native/planted vegetation

Source:
Boundary: Client Provided (01 May 2025)
Base Data: NSW DCDB/DTDB.
Imagery: ESRI World Imagery

Coordinate System:
GDA 1994 MGA Zone 56

Date: 06/06/2025

Created By: CB

Drawing Size: A3

0 50 100m

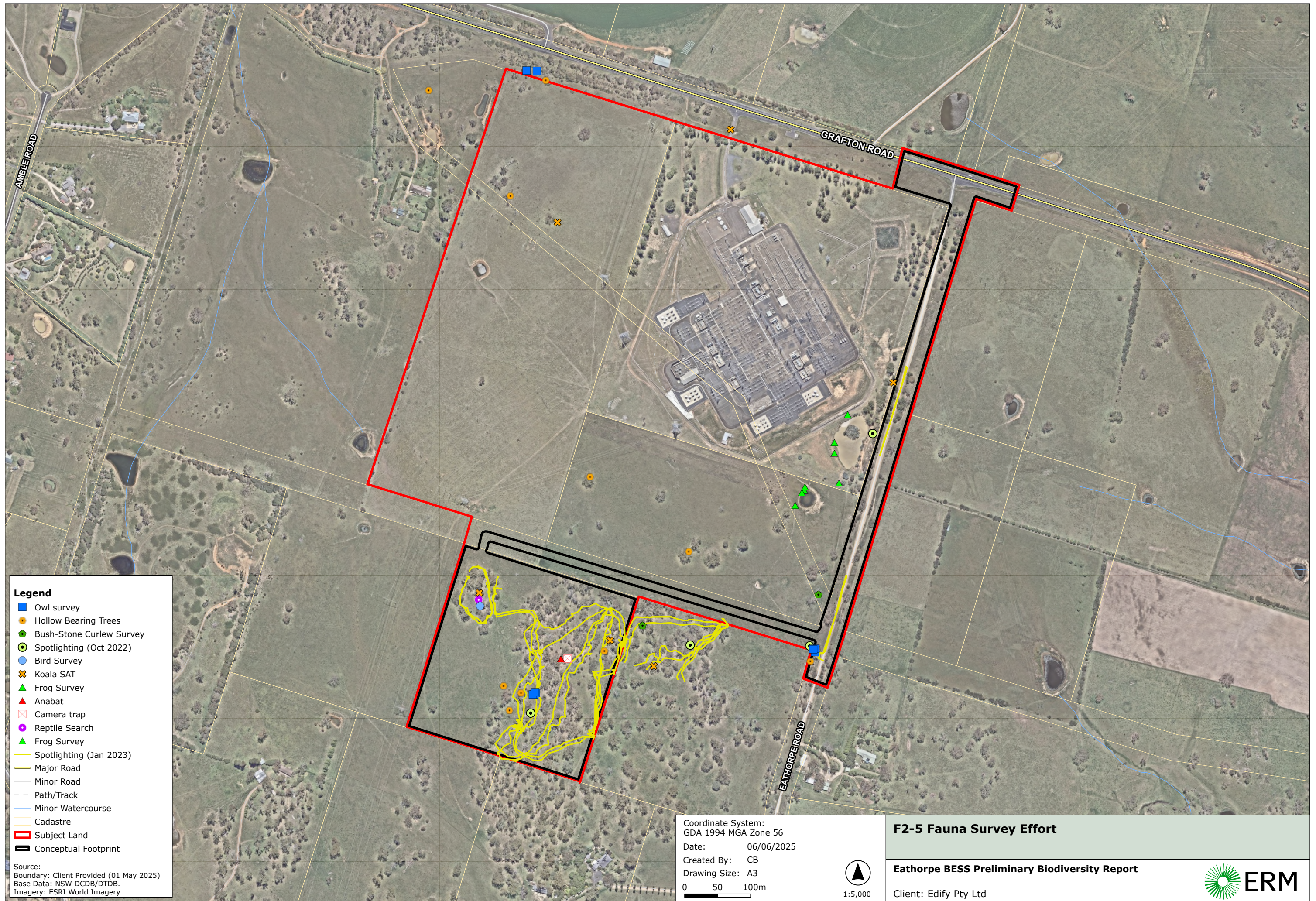
1:5,000

F2-4 Flora Survey Effort

Eathorpe BESS Preliminary Biodiversity Report

Client: Edify Pty Ltd





2.3 LIKELIHOOD OF OCCURRENCE ASSESSMENT

Consistent with the accepted approach for biodiversity assessment, a likelihood of occurrence assessment was undertaken for the Subject Land, informed by desktop sources and the initial field survey results (DEC, 2004). Desktop sources (BioNet and ALA) identified several 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 km buffer of the project boundary (the locality). The likelihood of occurrence approach refines the desktop generated list using site-specific and specific-species habitat information.

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 2-4**.

TABLE 2-4 LIKELIHOOD OF OCCURRENCE ASSESSMENT

	Preferred habitat exists	Suitable habitat exists²	Habitat does not exist³
Recent ¹ records within the Subject Land	Known	Known	Known
Recent records in the Locality ⁴	Likely	Potential	Unlikely
No records within the Locality, but the Subject Land is within known distribution	Potential	Potential	Unlikely
No records in the Locality, and the Subject Land is outside of distribution	Unlikely	Unlikely	Unlikely

1. Recent records are those that have been recorded in the last 20 years.
 2. Habitat may be considered suitable, but not preferred because: some desired habitat features may be present, but not all; habitat may have poor connectivity; or habitat may be known to be disturbed.
 3. Based on sources reviewed and/or field survey results.
 4. 'Locality' refers to a 10 km² buffer around the Subject Land and is inclusive of the Subject Land.

2.4 WEATHER CONDITIONS

Weather conditions during the flora and fauna surveys were appropriate for detection of a variety of targeted species. **Table 2-5** details the daily weather observations that were recorded during the field survey events for the nearest weather station, Armidale NSW.

TABLE 2-5 WEATHER CONDITIONS

Date	Minimum Temperature (°C)	Maximum Temperature (°C)	Rainfall (mm)	Wind Speed at 9am (km/h)
13/06/2022	-0.5	14.5	0	30
14/06/2022	-4.9	15.2	0	39
15/06/2022	-3.3	15.4	0	41
16/06/2022	-0.6	15.9	0	39
25/10/2022	9.9	23.2	2.6	43

Date	Minimum Temperature (°C)	Maximum Temperature (°C)	Rainfall (mm)	Wind Speed at 9am (km/h)
26/10/2022	9.9	22.7	0	48
27/10/2022	8.1	25.5	0	54
28/10/2022	6.6	19.5	6.4	56
16/01/2023	12	26.3	0	43
17/01/2023	10.7	26.4	0	39
18/01/2023	10.1	29.8	0	30
19/01/2023	13.1	27.5	0	39
20/01/2023	13	20.8	0	46

Source: BoM Armidale, New South Wales Daily Weather Observations

<http://www.bom.gov.au/climate/dwo/202206/html/IDCJDW2004.202206.shtml>

2.5 LIMITATIONS

The field and desktop assessments undertaken to inform this report provide a detailed overview of the biodiversity values that exist within the Subject Land. However, results are potentially limited by the inherent nature of the targeted species.

Some plant species that occur in the local area, such as cryptic species, are annuals and are present only in the seed bank for much of the year. Other plant species are perennial but are inconspicuous or difficult to identify unless flowering.

Similarly, some fauna species that have been recorded in the local area that occur on a seasonal or migratory basis may be absent from the locality for much of the year. Fauna behaviours may have also affected detectability; species that are easily disturbed or cryptic may not have been detected.

Allowances were made for species which may occur based on known current research and habitat preferences. The survey focused on the identification of the vegetation communities and threatened species, or potential habitat for threatened species.

Surveys attempted to capture a snapshot of the site and its condition. The PBR should not be considered to be an exhaustive list of species present on site.

2.6 LICENSING

Regarding the flora and fauna surveys conducted for this PBR, ERM operated under the Scientific Licence of SL100196 and Animal Ethics Accreditation number 53055.

3. SITE CONTEXT

3.1 LANDSCAPE FEATURES

The landscape features of the Subject Land, as required by sections 4.2 and 4.3 of the BAM are presented in **Table 3-1**.

TABLE 3-1 SUMMARY OF LANDSCAPE FEATURES

Landscape feature	Description
IBRA Bioregion and Subregion	The Subject Land occurs within the Armidale Plateau Subregion of the New England Tablelands IBRA bioregion.
NSW (Mitchell) Landscape Regions	The Subject Land is situated in Dingo Spur Meta-sediments.
Rivers, Streams, Estuaries, and Wetlands	There are no mapped hydro lines or wetlands within the Subject Land. The Subject Land is part of the Macleay River catchment, with Commissioners Waters (first order stream, approx. 883 m east) and Dumaresq Creek (first order stream, approx. 1077 m north) within the Assessment Area. Commissioners Waters was formed by the confluence of the Dumaresq Creek and Tilbuster Ponds. The river flows generally to the southeast, joined by a minor tributary, before reaching the Gara River. The Project is not expected to have direct or indirect impacts to hydrology features, with measures to mitigate sediment runoff and protect water quality to be implemented during construction and operation phases.
Wetlands and aquatic habitat	There are no wetlands within the Assessment Area. Artificial water sources are present across the site in the form of a farm dam and a storm water runoff pool adjacent to the existing Armidale substation. These entities will not be disturbed as a result of the Project.
Habitat Connectivity	The Subject Land is situated in an agricultural landscape with low levels of connectivity. Connectivity is present as small patches of vegetation connected by paddock trees and planted vegetation along roadsides or associated with urban plantings only. The project boundary is 2.54 km north of the Imbota Nature Reserve, and 3.3 km south of the Yina Nature Reserve. The existing landscape provides potential barriers to habitat connectivity, which is likely restricted to mobile fauna (birds, bats). The Project is not expected to increase a restriction of habitat connectivity.
Geological Features of Significance	The Subject Land does contain a small collection of rocky outcrops. This habitat does not form part of a TEC, nor is it considered suitable for threatened species, including the Brush-tailed Rocky-wallaby and cave dwelling microbats. Reptiles are unlikely to utilise the habitat. The Project is not expected to have direct or indirect impact to karst, caves, crevices, cliffs, rocks or other geological features of significance to threatened species.

Landscape feature	Description
Soil Hazard Features	There are no known significant soil hazard features within the Subject Land or Assessment Area. A search of the ASC Soil Type Map reveals that the Kandosol soils type dominates most of the Development Footprint. Kandosols are characterised as red, yellow and grey massive earths. The soils tend to have a sandy to loamy-surface soil, grading to porous sandy-clay subsoils with low fertility and poor water-holding capacity; however, support sheep and cattle grazing on native pastures. Kurosols are mostly found within TransGrid land. Lot 842 appears to be entirely mapped as Kandosols (Ka). These soils display a strong texture contrast between surface horizons and subsoil horizons and the upper part of the subsoil is strongly acid (i.e., pH <5.5). A search of the NSW EPA Contaminated Sites Register, identified the closest sites recorded to the Subject Land. There are six sites within the Armidale LGA with current or former Declarations of Significantly Contaminated Land, with five located in the suburb of Armidale, and one located in Tilbuster. All sites are over 5 km from the Subject Land.
Areas of Outstanding Biodiversity Value (AOBV)	There are no Areas of Outstanding Biodiversity Values mapped within the Subject Land.

3.2 NATIVE VEGETATION COVER AND PATCH SIZE

3.2.1 NATIVE VEGETATION COVER

The native vegetation cover of the Assessment Area was determined in accordance with Section 3.2 of the BAM. Native vegetation cover within the Assessment Area is used to inform the BAM-C in predicting Candidate Species relevant to the assessment.

Native vegetation occurring within the Assessment Area was calculated using field-based survey results, in combination with data extracted from the recently published draft NVR Map to determine the cover of woody and non-woody native vegetation.

The extent of native vegetation across the Assessment Area is summarised in **Table 3-2**. It was determined that the percentage of native vegetation cover within the Assessment Area is 266.43 ha, or 24% and has been assigned to the class of >10 - 30% as per Section 3.2 of the BAM.

TABLE 3-2 AREA OF NATIVE VEGETATION

Aspect	Value
Assessment Area	1114.36 ha
Total area of native vegetation cover	266.43 ha
Percentage of native vegetation cover	24%
Class (0-10, >10-30, >30-70 or >70%)	>10-30

3.2.2 PATCH SIZE

Patch size is defined in the BAM as an area of intact native vegetation that occurs on the development site and includes native vegetation that has a gap of less than 100 m from the next area of moderate to good condition native vegetation (or ≤ 30 m for non-woody ecosystems).

Patch size may extend onto adjoining land that is not part of the development site. The patch size in which the subject vegetation occurs is greater than 100 ha. This includes vegetation onsite and contiguous vegetation to the south of the Subject Land. The >100 ha patch size class has therefore been used to assess the habitat suitability of the Subject Land for threatened species in Section 4.

3.2.3 LAND CATEGORY ASSESSMENT

The development of the BESS will require assessment using the BAM and the preparation of a BDAR to support the submission of the EIS. Part 6 Division 2 section 6.8 (3) of the NSW BC Act determines that the BAM is to exclude the assessment of the impacts of clearing of native vegetation on Category 1 - exempt land (within the meaning of Part 5A of the NSW LLS Act, other than prescribed impacts (e.g., impacts on the habitat of threatened species). This determination is repeated in section 1.5 (1)(d) of the BAM.

BAM accredited assessors may establish a reasonable approximation of land categorisation for the Environment Agency Head (EAH) to consider. An outline of an evidence-based approach to identifying NVR map land categorisation, and the biodiversity assessment requirements in relation to Category 1 – exempt land, is provided in the guide *Determining native vegetation land categorisation for application in the Biodiversity Offsets Scheme* (DPIE, 2023).

There is a portion of Category 1 – exempt land within the Development Footprint, as shown in **Figure 2-3**. Based on surveys completed to date, the extent of this land is deemed to be correct and subsequently a submission is unlikely to be made to the EAH.

4. NATIVE VEGETATION, THREATENED ECOLOGICAL COMMUNITIES AND VEGETATION INTEGRITY

This section describes the PCTs present across the Subject Land, in accordance with the requirements of Section 4 of the BAM as listed below:

- Vegetation formation and class;
- Species relied upon for identification of vegetation type and relative abundance;
- Justification of evidence used to identify a PCT (as outlined in paragraph 5.2.1.12 of the BAM);
- TEC status (as outlined in paragraph 5.2.1.14-15 of the BAM); and
- Estimate percentage cleared value of PCT (as outlined in paragraph 5.2.1.16 of the BAM).

4.1 MAPPING PLANT COMMUNITY TYPES AND ECOLOGICAL COMMUNITIES

4.1.1 PCTS WITHIN THE SUBJECT LAND AND FOOTPRINT

A desktop analysis of the SVTM identified occurrences of the following PCTs across the Subject Land:

- 3344 New England Ribbon Gum Grassy Forest; and
- 3359 New England Hills Stringybark – Box Woodland.

PCT 3344 has been mapped under the SVTM as largely occurring across Lot 842 with Eathorpe Road mapped as PCT 3359. Preliminary field surveys attempted to ground-truth the vegetation and determine if SVTM reflects on-ground vegetation (see Section 2.2.2.2 for additional information on survey effort).

Preliminary analysis of BAM plot data and rapid vegetation assessments identified that the vegetation within the Subject Land and Development Footprint has been assessed as aligning with the BioNet Vegetation Classification PCTs identified within **Table 4-1**. Their extent is shown in **Figure 4-1**. A detailed description of each PCT identified within the Development Footprint is provided in the following subsections. Associated BAM plot data has been provided in **Appendix C**. Further vegetation analysis is recommended as part of the preparation of a BDAR to confirm the PCT relevancy at the time of the BDAR being prepared.

TABLE 4-1 PCTS IDENTIFIED IN THE DEVELOPMENT FOOTPRINT

PCT ID	PCT Name	Subject Land Area (ha)	Development Footprint Area (ha)
3359	New England Hills Stringybark-Box Woodland	43.54	16.78
3363	Western New England Blakely's Red Gum-Box Grassy Forest.	2.39	1.62
Total area		45.93	18.4

Field verification confirmed the presence of PCT 3359 across the Subject Land and within the Development Footprint. PCT 3359 is present as a grassy woodland dominated by Broad-leaved Stringybark, and as a derived native grassland with remnant Broad-leaved Stringybark paddock trees. **Table 4-2** provides an overview of PCT 3359 present within the Subject Land.

TABLE 4-2 DESCRIPTION OF PCT 3359 NEW ENGLAND HILLS STRINGYBARK-BOX WOODLAND

PCT 3359 New England Hills Stringybark-Box Woodland		
PCT ID	3359	
PCT name	New England Hills Stringybark-Box Woodland	
Vegetation formation	KF_CH3 Grassy Woodlands	
Vegetation class	New England Grassy Woodlands	
Percent cleared value	82.44%	
Extent within Subject Land	• 43.54 ha in Subject Land • 36.22 ha present as derived native grassland • 7.32 ha present as woodland • 16.78 ha present in Development Footprint	
PCT Images	Derived Native Grassland 	Woodland 
PCT Justification	PCT 3359 was selected as the most likely PCT due to the following attributes recorded during field validation and desktop analysis: • Vegetation formation is Grassy Woodland • Situated within New England Tableland Bioregion • The canopy is dominated by <i>Eucalyptus caliginosa</i>. Other canopy diagnostic species <i>E.melliodora</i>, <i>E.blakelyi</i> and <i>Angophora floribunda</i> also present in lower abundance and coverage. • Diagnostic mid and ground stratum species present, although impacts of cattle grazing and weed incursions observed.	

PCT 3359 New England Hills Stringybark-Box Woodland	
Diagnostic species of PCT identified	• <i>Eucalyptus caliginosa</i> (Tree - dominant) • <i>Eucalyptus melliodora</i> (Tree) • <i>Eucalyptus blakelyi</i> (Tree) • <i>Angophora floribunda</i> (Tree) • <i>Cassinia quinquefaria</i> (Shrub) • <i>Bursaria spinosa</i> subsp. <i>spinosa</i> (Shrub) • <i>Sporobolus creber</i> (Grass) • <i>Chrysocephalum apiculatum</i> (Forb) • <i>Poa sieberiana</i> (Grass) • <i>Bothriochloa macra</i> (Grass) • <i>Lagenifera stipitate</i> (Forb) • <i>Rumex brownie</i> (Forb)
Alternative PCT	Based on the IBRA Bioregion, IBRA sub-region, and presence of <i>E. caliginosa</i> and presence of <i>E. melliodora</i>, PCT 1331 Yellow Box - Broad-leaved Stringybark shrubby open forest of the New England Tableland Bioregion (New PCT 3507 Tenterfield Plateau Stringybark Sheltered Forest) was also considered. PCT 1331 vegetation formation Grassy Woodland and vegetation class New England Grassy Woodlands aligns with the vegetation present, and both dominant species of the community are present. However, PCT 1331 was not selected as there was a lack of associated mid stratum diagnostic species, lack of association with upper stratum species <i>A. floribunda</i>, and lower ground stratum alignment when compared to PCT 3359.
Vegetation Zones (VZ)	PCT 3359 is present within the Subject Land as two identified VZ: • Zone 1 – moderate condition. Exhibited as tall, generally intact mature canopy with grassy understory. The community has low mid stratum cover and abundance, and generally disturbed ground stratum due to current and historical grazing pressures; and • Zone 2 – low condition. Presented as derived grassland with isolated remnant mature paddock trees only, as a result of clearing for agricultural practices. The VZs within Subject Land are shown in Figure 4-2, the extent of each VZ is: • Zone 1: 7.32 ha • Zone 2: 36.22 ha
TEC Status	PCT 3359 is associated with BC Act and EPBC Act listed TECs within the BioNet Vegetation Classification: • EPBC Act listed White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland; and • BC Act listed White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions. Mapped areas of PCT 3359 do not conform to the BC Act or EPBC Act listed TEC. This is further discussed in Section 4.1.2

Field verification confirmed PCT 3363 as present within the Development Footprint. This community is present as a linear patch along Eathorpe Road and has a grassy understory.

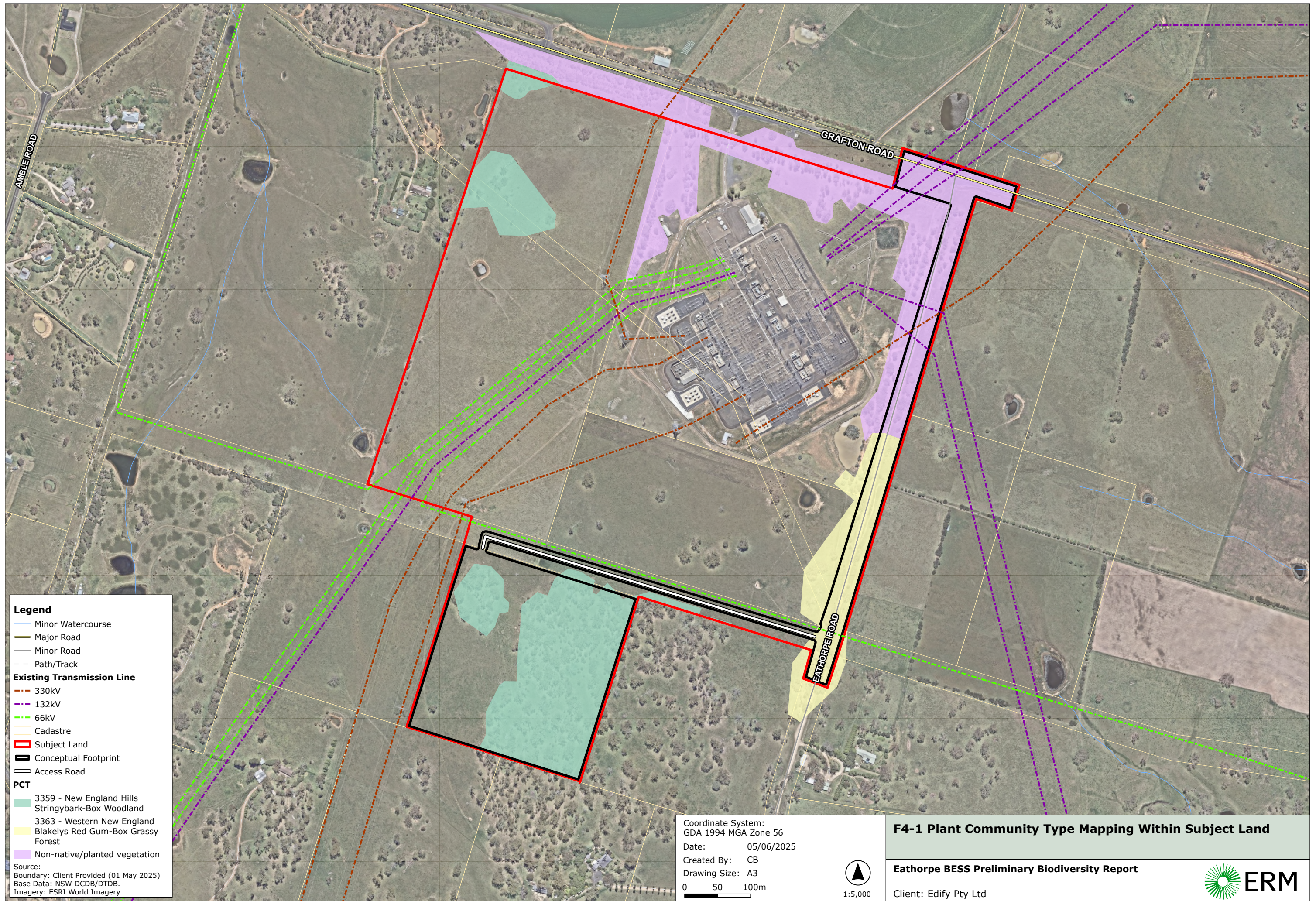
Table 4-3 provides an overview of PCT 3363 present within the Subject Land.

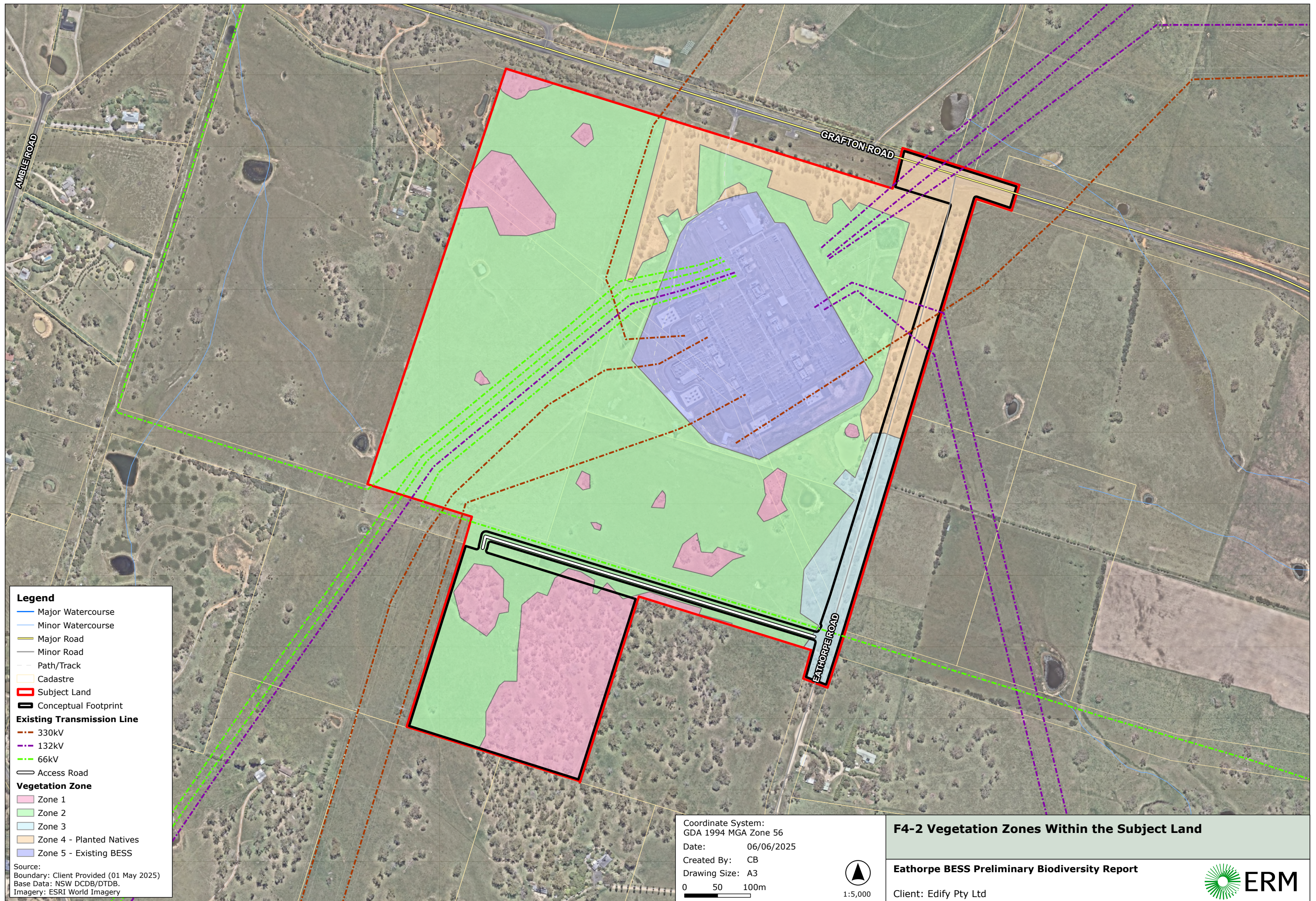
TABLE 4-3 DESCRIPTION OF PCT 3363 WESTERN NEW ENGLAND BLAKELYS RED GUM-BOX GRASSY FOREST

PCT 3363 WESTERN NEW ENGLAND BLAKELYS RED GUM-BOX GRASSY FOREST	
PCT ID	3363
PCT name	Western New England Blakely's Red Gum-Box Grassy Forest
Vegetation formation	KF_CH3 Grassy Woodlands
Vegetation class	New England Grassy Woodland
Percent cleared value	72.25%
Extent within Subject Land	• 2.39 ha in Subject Land, presented as woodland • 1.62 ha in Development Footprint, presented as woodland
PCT Images	
PCT Justification	PCT 3363 was selected as the most likely PCT due to the following attributes observed during field validation and desktop analysis: • Vegetation formation is Grassy Woodland • Situated within New England Tableland Bioregion • The canopy is dominated by diagnostic species <i>Eucalyptus blakelyi</i>. Additional diagnostic species present include <i>E. melliodora</i> and <i>E. viminalis</i>.
Diagnostic species of PCT identified	• <i>Eucalyptus blakelyi</i> (Tree - dominant) • <i>Eucalyptus melliodora</i> (Tree) • <i>Eucalyptus caliginosa</i> (Tree) • <i>Lissanthe strigosa</i> (Shrub) • <i>Poa sieberiana</i> (Grass) • <i>Rytidosperma racemosum</i> (Grass) • <i>Haloragis heterophylla</i> (Forb) • <i>Chrysocephalum apiculatum</i> (Forb) • <i>Geranium solanderi</i> (Forb) • <i>Rumex brownie</i> (Forb) • <i>Dianella revolta</i> (Forb)
Alternative PCT	Based on the IBRA Bioregion, IBRA sub-region, and presence of <i>E. caliginosa</i>, <i>E. melliodora</i>, and <i>E. blakelyi</i> PCT 1331 Yellow Box - Broad-leaved Stringybark shrubby open forest of the New England Tableland Bioregion (New PCT 3507 Tenterfield Plateau Stringybark Sheltered Forest) was also considered. PCT 1331 vegetation formation Grassy Woodland and vegetation class New England

PCT 3363 WESTERN NEW ENGLAND BLAKELYS RED GUM-BOX GRASSY FOREST

	Grassy Woodlands aligns with the vegetation present, and both dominant species of the community are present. However, PCT 1331 was not selected as <i>E. blakelyi</i> is the dominant upper stratum species present, there was a lack of associated mid stratum diagnostic species, lack of association with upper stratum species <i>A. floribunda</i>, and lower ground stratum alignment when compared to PCT 3363.
Vegetation Zones	PCT 3363 was present in one assigned vegetation zone, Zone 3 (Low condition). The vegetation is present as a remnant linear patch along Eathorpe Road. The patch contains mature <i>E. blakelyi</i> and regrowth. The zone is considered low condition based on the understory consisting of native coverage of low diversity, with incursions from exotic groundcover species including three high threat weeds. The VZ within Subject Land are shown in Figure 4-2, the extent of each VZ is: Zone 3: 2.39 ha
TEC Status3363	PCT 3363 is associated with BC Act and EPBC Act listed TECs within the BioNet Vegetation Classification: - EPBC Act listed White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland; - BC Act listed White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions; and - PCT 3363 conforms with both BC Act and EPBC Act TEC. This is further discussed in Section 4.1.2.





Legend

- Major Watercourse
- Minor Watercourse
- Major Road
- Minor Road
- Path/Track
- Cadastre
- Subject Land
- Conceptual Footprint
- Existing Transmission Line**
- 330kV
- 132kV
- 66kV
- Access Road
- Vegetation Zone**
- Zone 1
- Zone 2
- Zone 3
- Zone 4 - Planted Natives
- Zone 5 - Existing BESS

Source:
Boundary: Client Provided (01 May 2025)
Base Data: NSW DCDB/DTDB.
Imagery: ESRI World Imagery

Coordinate System:
GDA 1994 MGA Zone 56

Date: 06/06/2025

Created By: CB

Drawing Size: A3

0 50 100m

1:5,000

F4-2 Vegetation Zones Within the Subject Land

Eathorpe BESS Preliminary Biodiversity Report

Client: Edify Pty Ltd



4.1.2 THREATENED ECOLOGICAL COMMUNITIES

Based on the BioNet Vegetation Classification database, two TECS have the potential to be associated with PCT 3359 and PCT 3363, as shown in **Table 4-4**. Field validation of these communities confirmed that only PCT 3363 conforms with the criteria to form part of the critically endangered ecological community White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and derived native grassland set out in the BC Act and EPBC Act, as detailed in **Sections 4.1.2.1** and **4.1.2.2**.

The Subject Land contains 2.39 ha of this TEC (**Photograph 1**) along Eathorpe Rd on the eastern boundary. Clearing may be required along this road for access/traffic purposes, it is currently undetermined how much TEC will need to be cleared to facilitate access, this will be confirmed in the BDAR following a full assessment. For this PBR, a worst case scenario has been used, assuming the full 2.39 ha will be cleared. However, the future design will aim to avoid unnecessary impacts and minimise disturbance to this TEC.



PHOTOGRAPH 1 WHITE BOX - YELLOW BOX - BLAKELY'S RED GUM GRASSY WOODLAND AND DERIVED NATIVE GRASSLAND TEC (*E. BLAKELYI* SPECIMEN) ALONG EATHORPE ROAD

TABLE 4-4 THREATENED ECOLOGICAL COMMUNITIES WITHIN THE SUBJECT LAND

TEC Name	BC Act	EPBC Act	Associated vegetation zones within the Subject Land	Area (ha) in Subject Land	Area (ha) within Disturbance Footprint
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland	-	CE	PCT3363_Low Woodland	2.39	1.62
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	CE	-	PCT3363_Low Woodland	2.39	1.62

4.1.2.1 ALIGNMENT WITH BC ACT LISTED TEC

The BC Act listed White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions TEC is listed as critically endangered. Based on the BioNet Vegetation Classification database this TEC has potential to be associated with PCT 3359 and PCT 3363, both mapped within the Subject Land.

Based on the Conservation Advice (NSW DECCW, 2010) to meet the BC Act TEC criteria, the ecological community present will be characterised by the current, or historical, dominant or co-dominant canopy species;

- White Box (*Eucalyptus albens*);
- Yellow Box (*E. melliodora*); and/or
- Blakely's Red Gum (*E. blakelyi*).

Based on field verification, the ecological community mapped as PCT 3359 is dominated by *E. caliginosa*. Although the diagnostic species of the TEC are present, they occur at low numbers and are not dominant or co-dominant in the ecological community present within mapped areas of PCT 3359. Therefore, mapped areas of PCT 3359 do not conform to the BC Act listed TEC (Cth DCCEEW, 2023; NSW TSSC, 2020a; NSW TSSC, 2020b).

The ecological community mapped as PCT 3363 is considered to conform with the BC Act TEC White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland, as the community meets the following criteria addressed in **Table 4-5**.

The BC Act listed TEC associated with PCT 3363 is present as a disturbed remnant linear patch along Eathorpe road. Regrowth of *E. blakelyi* was observed commonly within the community along with prevalence of weed species.

TABLE 4-5 BC ACT TEC CRITERIA

Criteria	Meets criteria	Relevance to PCT 3363
Dominated or co-dominated by: - White Box (<i>Eucalyptus albens</i>) and/or - Yellow Box (<i>E. melliodora</i>) and/or - Blakely's Red Gum (<i>E. blakelyi</i>)	Yes	PCT 3363 is dominated by Blakely's Red Gum (<i>E. blakelyi</i>)
Within an IBRA bioregion associated with the TEC	Yes	Subject Land situated within the associated New England Tableland IBRA Bioregion
Understory is characterised by native grasses and forbs with a lack of shrub species.	Yes	The understory present within PCT 3363 is characterised by native grasses and forbs, with no native shrubs recorded (BAM12, SUMBAM03). However, it is noted that weed incursions, inclusive of high threat weeds, were prevalent within the community.
Community characterised by the assemblage of species listed in Part 1 of the final determination (NSW Threatened Species Scientific Committee, 2020)	Yes	Canopy species: <i>Eucalyptus blakelyi</i> <i>Eucalyptus melliodora</i> <i>Eucalyptus caliginosa</i> Grass species: <i>Poa sieberiana</i> <i>Sporobolus creber</i> Forb species: <i>Chrysocephalum apiculatum</i> <i>Geranium solanderi</i> <i>Wahlenbergia communis</i>

4.1.2.2 ALIGNMENT WITH EPBC ACT LISTED TEC

The EPBC Act listed White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland is associated with PCT 3359 and PCT 3363 mapped within the Subject Land.

To meet the EPBC Act listed TEC criteria, the ecological community must be, or have previously been, dominated or co-dominated by one or more of the following overstory species:

- White Box (*Eucalyptus albens*);
- Yellow Box (*E. melliodora*); or
- Blakely's Red Gum (*E. blakelyi*).

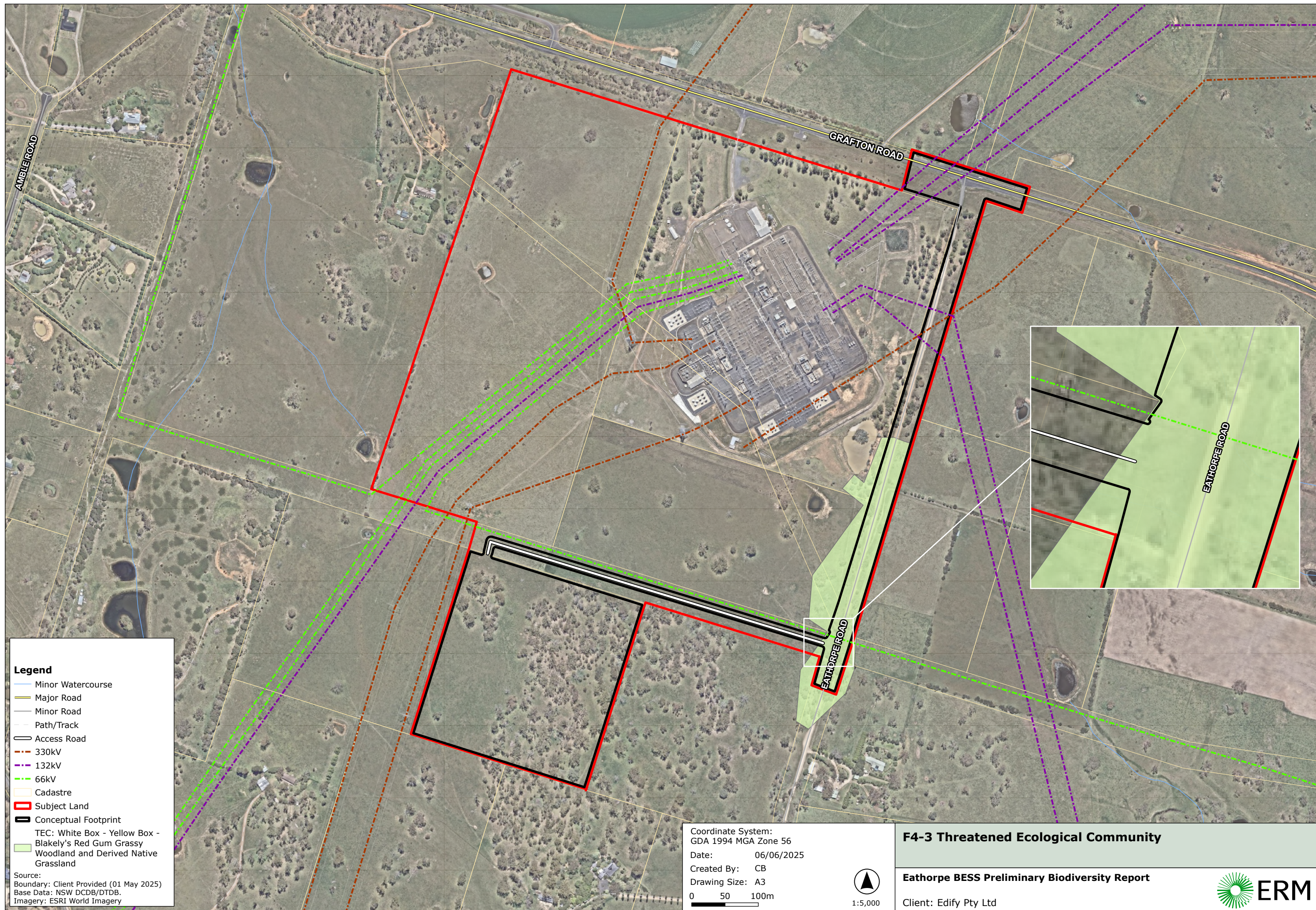
The EPBC Act listed TEC can also be dominated by Western Grey Box (*E. microcarpa*) or Coastal Grey Box (*E. moluccana*) in the Nandewar bioregion.

Based on field verification, the ecological community mapped as PCT 3359 is dominated by *E. caliginosa*. Diagnostic species are present however, are not dominant or co-dominant in the ecological community present within mapped areas of PCT 3359. Therefore, the areas mapped as PCT 3359 do not conform to the EPBC Act listed TEC.

The ecological community mapped as PCT 3363 is considered to conform with the EPBC Act listed White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland TEC, as the community meets the criteria presented in the Commonwealth Advice as addressed in **Table 4-6** (Cth DCCEEW, 2023; NSW TSSC, 2020a; NSW TSSC, 2020b).

TABLE 4-6 EPBC ACT TEC CRITERIA

Criteria	Meets criteria	Relevance to PCT 3363
A dominance or prior dominance of • White Box (<i>Eucalyptus albens</i>) and/or • Yellow Box (<i>E. melliodora</i>) and/or • Blakely's Red Gum (<i>E. blakelyi</i>)	Yes	PCT 3363 is dominated by Blakely's Red Gum (<i>E. blakelyi</i>)
Have a predominantly native understorey	Yes	The patch of PCT 3363 has a predominately native understorey (BAM12 has 74% native understorey coverage; BAMSUM03 has 53% native understorey coverage)
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.	Yes	The patch located on the eastern boundary along Eathorpe Rd, does not have 12 or more native species (excluding grasses) present , with one important species present (<i>Chrysocephalum apiculatum</i>). However, the patch is > 2 ha (2.39 ha) and natural regeneration of overstorey species, <i>E. blakelyi</i> , is present commonly.



4.2 SERIOUS AND IRREVERSIBLE IMPACTS (SAII)

An SAII entity is listed under the BC Act as an impact that is likely to contribute significantly to the risk of extinction of a threatened entity.

An impact is to be regarded as serious and irreversible if it is likely to contribute significantly to the risk of a threatened species or ecological community becoming extinct through one or more of the following principles:

1. It will cause a further decline of a species or ecological community that is currently observed, estimated, inferred or reasonably suspected to be in a rapid rate of decline;
2. It will further reduce the population size of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very small population size;
3. It is an impact on the habitat of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very limited geographic distribution; or
4. The impacted species or ecological community is unlikely to respond to measures to improve its habitat and vegetation integrity and therefore its members are not replaceable.

In terms of the assessment of entities identified at risk of a SAII, where impacted by a SSD project, the Minister for Planning is required to:

- Take those impacts into consideration, and
- Determine whether there are any additional and appropriate measures that will minimise those impacts if consent or approval is to be granted.

Based on the results of the field surveys and this PBR, the Critically Endangered White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland TEC, has been identified within the Subject Land and Development Footprint. This TEC is listed as a SAII entity under Principles 1 and 2.

Under the current Project design, approximately 1.62 ha of this TEC will be impacted as part of the proposal due to access road upgrade requirements needed to support the ongoing function of the Subject Land. Impacts to the TEC have taken a precautionary approach using the defined Development Footprint and calculation of the 'worst case' scenario associated with the current development design. A BDAR to be prepared as a result of SEARs will provide refined Development Footprint detail and include an assessment of SAII entities, including this TEC as per Section 9.1 of the BAM.

5. LISTED SPECIES

The following sections identify ecosystem credit species, species credit species and dual credit species, and additional species relevant to the Subject Land in accordance with the requirements of Section 5 of the BAM. These threatened species have been identified by the BAM-C as potential species that require assessment of habitat suitability. The next section aims to determine which species will be retained for further assessment in the Project BDAR.

In this section, species listed under the EPBC Act have also been considered for their likelihood to occur within Subject Land, which will be the basis of determining any future MNES.

Four listed species, were recorded within the Subject Land during targeted surveys:

- Little Eagle (*Hieraaetus morphnoides*) – dual credit species;
- Masked Owl (*Tyto novaehollandiae*) – dual credit species;
- Large Bent-winged Bat (*Miniopterus orianae oceanensis*) – dual credit species; and
- Southern Myotis (*Myotis macropus*) – candidate species.

No listed flora or migratory fauna species were detected during the field survey. A desktop assessment of the likelihood of occurrence was conducted for the ecosystem/candidate species in **Appendix D** and the MNES species which is included in **Section 5.3**.

5.1 HABITAT SUITABILITY

5.1.1 PREDICTED SPECIES

Ecosystem credit species, also referred to as 'predicted species', are threatened species whose occurrence can generally be predicted by vegetation surrogates and/or landscape features, or that have a low probability of detection using targeted surveys. The TBDC identifies the threatened species assessed for ecosystem credits. A targeted survey is not required to identify or confirm the presence of ecosystem credit species.

The ecosystem credit species predicted to occur on or use the Subject Land as advised by the BAM-C are listed in **Table 5-1**. A review of this list has excluded some species from further consideration due to lack of habitat suitability. The predicted species list generated by the BAM-C is attached as **Appendix E**.

TABLE 5-1 BAM-C PREDICTED ECOSYSTEM CREDIT SPECIES

Common name	Scientific name	BC Act	EPBC Act	Sensitivity to gain class	Species retained for further assessment
Regent Honeyeater (foraging)	<i>Anthochaera phrygia</i>	CE	CE	High	Yes
Dusky Woodswallow	<i>Artamus cyanopterus cyanopterus</i>	V	-	Moderate	Yes
Glossy Black-Cockatoo (foraging)	<i>Calyptorhynchus lathami</i>	V	V	High	Excluded No <i>Allocasuarina</i> or <i>Casuarina</i> sp. identified within the Subject Land.
Speckled Warbler	<i>Chthonicola sagittata</i>	V	-	High	Yes

Common name	Scientific name	BC Act	EPBC Act	Sensitivity to gain class	Species retained for further assessment
Spotted Harrier	<i>Circus assimilis</i>	V	-	Moderate	Yes
Brown Treecreeper (eastern subspecies)	<i>Climacteris picumnus victoriae</i>	V	V	High	Yes
Varied Sittella	<i>Daphoenositta chrysoptera</i>	V	-	Moderate	Yes
Spotted-tailed Quoll	<i>Dasyurus maculatus</i>	V	E	High	Yes
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>	E	-	Moderate	Excluded No swamps identified within the Subject Land or within the locality.
Black Falcon	<i>Falco subniger</i>	V	-	Moderate	Yes
-	<i>Eucalyptus scoparia</i>	E	V	Moderate	Yes
Eastern False Pipistrelle	<i>Falsistrellus tasmaniensis</i>	V	-	High	Yes
Little Lorikeet	<i>Glossopsitta pusilla</i>	V	-	High	Yes
Painted Honeyeater	<i>Grantiella picta</i>	V	V	Moderate	Excluded This species is found in association with mistletoe. Density of mistletoe suitable for the species not found within Subject Land
White-bellied Sea-Eagle (foraging)	<i>Haliaeetus leucogaster</i>	V	-	High	Yes
Little Eagle (foraging)	<i>Hieraaetus morphnoides</i>	V	-	Moderate	Yes
White-throated Needle-tail	<i>Hirundapus caudacutus</i>	V	V	High	Yes
Swift Parrot (foraging)	<i>Lathamus discolor</i>	E	CE	Moderate	Yes
Square-tailed Kite (foraging)	<i>Lophoictinia isura</i>	V	-	Moderate	Yes
Hooded Robin (south-eastern form)	<i>Melanodryas cucullata cucullata</i>	E	E	Moderate	Yes
Black-chinned Honeyeater (eastern subspecies)	<i>Melithreptus gularis gularis</i>	V	-	Moderate	Yes
Little Bent-winged Bat (foraging)	<i>Miniopterus australis</i>	V	-	High	Yes

Common name	Scientific name	BC Act	EPBC Act	Sensitivity to gain class	Species retained for further assessment
Large Bent-winged Bat (foraging)	<i>Miniopterus orianae oceanensis</i>	V	-	High	Yes
Turquoise Parrot	<i>Neophema pulchella</i>	V		High	Yes
Barking Owl (foraging)	<i>Ninox connivens</i>	V	-	High	Yes
Yellow-bellied Glider	<i>Petaurus australis</i>	V	V	High	Yes
Scarlet Robin	<i>Petroica boodang</i>	V	-	Moderate	Yes
Flame Robin	<i>Petroica phoenicea</i>	V	-	Moderate	Yes
Hastings River mouse	<i>Pseudomys oralis</i>	E	E	High	Yes
Grey-headed Flying-fox (foraging)	<i>Pteropus poliocephalus</i>	V	V	High	Yes
Yellow-bellied Sheathtail-bat	<i>Saccolaimus flaviventris</i>	V	-	Moderate	Yes
Diamond Firetail	<i>Stagonopleura guttata</i>	V	V	Moderate	Yes
Masked Owl (foraging)	<i>Tyto novaehollandiae</i>	V	-	High	Yes

5.1.2 CANDIDATE SPECIES

Species credit species, also referred to as 'candidate species', are threatened species for which vegetation surrogates and/or landscape features cannot reliably predict the likelihood of their occurrence. These species are identified in the TBDC. A targeted survey or an expert report is required to confirm the presence or absence of these species on the Subject Land.

Alternatively, for a development, activity, clearing or biodiversity certification proposal only, the Applicant may elect to assume presence of the species.

Review of the BAM-C provided a list of candidate species applicable to the Subject Land and are listed in **Table 5-2**.

Five (5) candidate species have been excluded from the assessment across the Subject Land. Exclusion from assessment is appropriate when one or more of the following factors is relevant to the species:

- Disturbance;
- Vagrancy;
- Geographical limitations; and/or
- Absence of habitat constraints.

Candidate species can be further excluded due to the absence of Important Habitat Maps where these are provided by the department, and through the preparation of an expert report.

The following candidate species have been excluded, all species excluded from further assessment are detailed in **Table 5-2**:

- Brush-tailed Rock-wallaby (*Petrogale penicillata*) – Habitat Constraint;
- Grey-headed Flying-fox (*Pteropus poliocephalus*) – Habitat Constraint;
- Powerful Owl (Breeding) (*Ninox strenua*) – Habitat Constraint;
- Regent Honeyeater (*Anthochaera phrygia*) – No Important Mapping; and
- Swift Parrot (Breeding) (*Lathamus discolor*) – No Important Mapping.

The retained candidate species list will form the basis for the preparation of the Project BDAR. In preparing the BDAR, surveys as required under the BAM will be completed for all candidate species using 'in force' guidance available at the time of preparing this PBR. The candidate species list generated by the BAM-C is attached as **Appendix F**.

TABLE 5-2 CANDIDATE SPECIES

Common name	Scientific name	BC Act	EPBC Act	Sensitivity to gain class	Species retained for further assessment
Flora					
-	<i>Caladenia amnicola</i>	E	-	Moderate	Yes This species has been added to the candidate species list since the original survey events in 2022-23. Therefore, this species was not surveyed for and needs to remain in the assessment
-	<i>Callistemon pungens</i>	-	V	High	Yes
Bluegrass	<i>Dichanthium setosum</i>	V	V	High	Yes
Northern Blue Box	<i>Eucalyptus magnificata</i>	E	-	High	Yes
Narrow-leaved Black Peppermint	<i>Eucalyptus nicholii</i>	V	V	High	Yes
Tall Velvet Sea-berry	<i>Haloragis exalata subsp. velutina</i>	V	V	High	Yes
Silky Swainson-pea	<i>Swainsona sericea</i>	V	-	High	Yes
Austral Toadflax	<i>Thesium australe</i>	V	V	Moderate	Yes
Fauna					
Tusked Frog population in the Nandewar and New England	<i>Adelotus brevis</i> - endangered population	E	-	Very High	Yes

Common name	Scientific name	BC Act	EPBC Act	Sensitivity to gain class	Species retained for further assessment
Tableland Bioregions					
Regent Honeyeater	<i>Anthochaera phrygia</i>	CE	CE	High	Excluded Excluded based on TBDC listed habitat constraint. The Subject Land is not within an area of mapped importance.
Bush Stone-curlew	<i>Burhinus grallarius</i>	E	-	High	Yes
Glossy Black-Cockatoo (Breeding)	<i>Calyptorhynchus lathami</i>	V	V	High	Yes
Eastern Pygmy-possum	<i>Cercartetus nanus</i>	V	-	High	Yes
Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	E	E	Very High	Yes
White-bellied Sea-Eagle (Breeding)	<i>Haliaeetus leucogaster</i>	V	-	High	Yes
Little Eagle (Breeding)	<i>Hieraaetus morphnoides</i>	V	-	Moderate	Yes
Swift Parrot (Breeding)	<i>Lathamus discolor</i>	E	CE	Moderate	Excluded Excluded based on TBDC listed habitat constraint. The Subject Land is not within an area of mapped importance.
Peppered Tree Frog	<i>Litoria piperita</i>	CE	V	High	Yes
Square-tailed Kite (Breeding)	<i>Lophoictinia isura</i>	V	-	Moderate	Yes
Large Bent-winged Bat (Breeding)	<i>Miniopterus orianae oceanensis</i>	V	-	Very High	Yes
Southern Myotis	<i>Myotis macropus</i>	V	-	High	Yes
Barking Owl (Breeding)	<i>Ninox connivens</i>	V	-	High	Yes
Powerful Owl (Breeding)	<i>Ninox strenua</i>	V	-	High	Excluded Species has been excluded based on TBDC listed geographical constraint. Subject Land is not within 5 km buffer of Macleay Gorges subregion.
Squirrel Glider	<i>Petaurus norfolcensis</i>	V	-	High	Yes

Common name	Scientific name	BC Act	EPBC Act	Sensitivity to gain class	Species retained for further assessment
Brush-tailed Rock-wallaby	<i>Petrogale penicillata</i>	E	V	Very High	Excluded Excluded based on listed habitat constraints. Subject Land is not within 1 km of rocky escarpments, gorges, steep slopes, boulder piles, rock outcrops or cliff lines suitable for the species.
Koala	<i>Phascolarctos cinereus</i>	E	E	High	Yes
Grey-headed Flying-fox (Breeding)	<i>Pteropus poliocephalus</i>	V	V	High	Excluded Excluded based on TBDC listed habitat constraints. Subject Land does not contain breeding camps.
Masked Owl (Breeding)	<i>Tyto novaehollandiae</i>	V	-	High	Yes

5.2 HABITAT SURVEYS: CANDIDATE SPECIES

A targeted survey or an expert report is required to confirm the presence or absence of candidate species. Alternatively, for a development activity, the Applicant may elect to assume the species is present.

5.2.1 THREATENED FLORA SPECIES

Threatened flora species were surveyed in accordance with Surveying threatened plants and their habitats (DPIE, 2020b) using parallel field transects as described in **Section 2.2.3.3** of this PBR. Survey effort for threatened flora candidate species assessed as having the potential to occur within the Subject Land is presented in **Table 5-3**.

TABLE 5-3 CANDIDATE FLORA SPECIES SURVEY EFFORT

Common name	Scientific name	Methods	Effort	Recorded
-	<i>Caladenia amnicola</i>	Targeted threatened species survey	Survey effort not met. New species returned from the BAM-C, was not surveyed in the 2022-23 survey event.	Not surveyed
-	<i>Callistemon pungens</i>	Targeted threatened species survey	Survey effort met. Approx. 11 hours of targeted parallel transects completed in associated PCTs.	No
Bluegrass	<i>Dichanthium setosum</i>	Targeted threatened species survey	Survey effort met. Approx. 11 hours of targeted parallel transects completed in associated PCTs.	No
Northern Blue Box	<i>Eucalyptus magnificata</i>	Targeted threatened species survey	Survey effort met. Approx. 11 hours of targeted parallel transects completed in associated PCTs.	No

Common name	Scientific name	Methods	Effort	Recorded
Narrow-leaved Black Peppermint	<i>Eucalyptus nicholii</i>	Targeted threatened species survey	Survey effort met. Approx. 11 hours of targeted parallel transects completed in associated PCTs.	No
Tall Velvet Sea-berry	<i>Haloragis exalata subsp. velutina</i>	Targeted threatened species survey	Survey effort met. Approx. 11 hours of targeted parallel transects completed in associated PCTs.	No
Silky Swainson-pea	<i>Swainsona sericea</i>	Targeted threatened species survey	Survey effort met. Approx. 11 hours of targeted parallel transects completed in associated PCTs.	No
Austral Toadflax	<i>Thesium australe</i>	Targeted threatened species survey	Survey effort met. Approx. 11 hours of targeted parallel transects completed in associated PCTs.	No

5.2.2 THREATENED FAUNA SPECIES

Threatened fauna species were surveyed in accordance with their relevant guidelines and NSW BioNet survey specifications, as detailed in **Table 5-4**.

TABLE 5-4 CANDIDATE FAUNA SPECIES SURVEY EFFORT

Common name	Scientific name	Methods	Effort	Recorded
Amphibians				
Tusked Frog population in the Nandewar and New England Tableland Bioregions	<i>Adelotus brevis</i> - <i>endangered population</i>	Nocturnal aural-visual amphibian surveys	Survey effort met. Surveys were undertaken over 2 nights, 25th and 26th October 2022, and a further 2 nights, 16th and 17th January 2023. Survey effort represented 8 person hours.	No
Peppered Tree Frog	<i>Litoria piperita</i>			No
Diurnal birds				
Glossy Black-Cockatoo	<i>Calyptorhynchus lathami</i>	Breeding and foraging habitat searches	Survey effort met. Completed opportunistically whilst undertaking all survey effort across the three survey events.	No
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	Stick nest and signs of raptor occupancy searches	Survey effort met. Completed opportunistically whilst undertaking all survey effort across the three survey events.	No
Little Eagle	<i>Hieraaetus morphnoides</i>			Yes
Square-tailed Kite	<i>Lophoictinia isura</i>	Dawn Bird survey	Survey effort met. A dawn bird survey was undertaken at one site for 30 minutes in October 2022.	No
Nocturnal Birds				
Bush Stone-curlew	<i>Burhinus grallarius</i>	Nocturnal spotlighting and call playback	Survey effort met. Survey was undertaken by two people, visiting the suitable habitat within the Subject Land on two separate nights,	No

Common name	Scientific name	Methods	Effort	Recorded
			spotlighting and playing calls back.	
Barking Owl	<i>Ninox connivens</i>	Tree hollow census	Survey effort met. Tree hollows were identified then call playback and spotlighting effort was undertaken at each site across four calm nights in winter 2022.	No
Masked Owl	<i>Tyto novaehollandiae</i>	Nocturnal spotlighting transects and call playback		Yes
Microbats				
Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	Ultrasonic call monitoring	Survey effort met. Titley Chorus was deployed between 16 th – 20 th January 2023 to record bat calls from sunset to dawn.	No
Large Bent-winged Bat	<i>Miniopterus orianae oceanensis</i>			Yes (probable)
Southern Myotis	<i>Myotis macropus</i>			Yes (possible)
Arboreal Marsupials				
Eastern Pygmy-possum	<i>Cercartetus nanus</i>	Nocturnal spotlighting transects and call playback	Survey effort met. Nocturnal spotlighting transects and call playback surveys were undertaken across four nights by two ecologists. Camera traps were deployed for four nights between 16 th – 20 th January 2023	No
Squirrel Glider	<i>Petaurus norfolcensis</i>			Baited camera traps
Koala	<i>Phascolarctos cinereus</i>	Nocturnal spotlighting transects and call playback Koala SATs	Survey effort met. Targeted Koala scat surveys were undertaken at 4 locations between 25 th October – 27 th October 2022, with additional scat searches undertaken opportunistically across the site. Camera traps were deployed for four nights between 16 th – 20 th January 2023.	No

5.3 THREATENED MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

The PMST search identified sixty-three (63) EPBC Act listed threatened species with potential to occur within the Subject Land. These species are assessed in **Table 5-5** using the local records shown in **Figure 5-1** to predict likelihood of occurrence. The PMST report is attached as **Appendix A**.

TABLE 5-5 THREATENED SPECIES IDENTIFIED BY THE PMST

Common Name	Scientific Name	BC Act	EPBC Act	Likelihood to occur within Subject Land
Five-clawed Worm-skink	<i>Anomalopus mackayi</i>	E	V	Unlikely • Outside of NSW distribution • Lacks preferred habitat • No records within locality
Regent Honeyeater	<i>Anthochaera phrygia</i>	-	CE	Potential • Subject Land is within the distribution for the species • Potential habitat in the form of open eucalypt woodland • Records within the locality • Subject Land is not within a mapped important area for Regent Honeyeater.
Southern Whiteface	<i>Aphelocephala leucopsis</i>	V	V	Unlikely • Subject Land is within the distribution for the species • Lacks preferred habitat • No record within Subject Land or locality
Pink-tailed Legless Lizard	<i>Aprasia parapulchella</i>	V	V	Unlikely • Outside of NSW distribution • Lacks preferred habitat • No records within locality
Hairy-joint Grass	<i>Arthraxon hispidus</i>	-	V	Unlikely • Subject Land is within the distribution for the species • Lacks wet eucalypt forest habitat near water sources • No records within the Subject Land or locality
-	<i>Bertya sp.</i> Clouds Creek (M.Fatemi 4)	E	E	Unlikely • Outside of NSW distribution • Lacks preferred habitat • No records within the Subject Land or locality
Australasian Bittern	<i>Botaurus poiciloptilus</i>	-	E	Unlikely • Lack of suitable habitat in the Subject Land. • No records within the Subject Land/locality.
-	<i>Callistemon pungens</i>	-	V	Unlikely • Subject Land is within the distribution for the species • Lacks rocky watercourses habitat • No records within the Subject Land or locality

Common Name	Scientific Name	BC Act	EPBC Act	Likelihood to occur within Subject Land
South-eastern Glossy Black-Cockatoo	<i>Calyptorhynchus lathami lathami</i>	-	V	Potential - Subject Land is within the distribution for the species - Lacks preferred foraging habitat - Subject Land does provide hollow bearing eucalypts as suitable nesting habitat
Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	-	E	Unlikely - Subject Land is within the distribution for the species - Lacks preferred habitat
Brown Treecreeper (south-eastern)	<i>Climacteris picumnus victoriae</i>	-	V	Likely - Subject Land is within the distribution for the species - Potential habitat in the form of open eucalypt woodland - Many records within the locality
White-flowered Wax Plant	<i>Cynanchum elegans</i>	-	E	Unlikely - Outside of NSW distribution - Lacks preferred habitat - No records within the Subject Land or locality
Spot-tailed Quoll	<i>Dasyurus maculatus maculatus</i> (SE mainland population)	-	E	Potential - Subject Land is within the distribution for the species - Potential habitat in the form of open eucalypt woodland - Recorded within the locality
Bluegrass	<i>Dichanthium setosum</i>	-	V	Potential - Subject Land is within the distribution for the species - Associated species present – <i>E. albens</i>, <i>E. melliodora</i> - Recorded within the locality
-	<i>Diuris eborensis</i>	-	E	Unlikely - Outside of NSW distribution - Lacks preferred habitat - No records within the Subject Land or locality
Red Goshawk	<i>Erythrorhynchus radiatus</i>	-	E	Unlikely - Outside of NSW distribution - Not recorded within the Subject Land or locality
Simple Crayfish	<i>Euastacus simplex</i>	-	E	Unlikely - Within EPBC potential distribution - Subject Land lacks preferred habitat - No records within the Subject Land or locality
McKie's Stringybark	<i>Eucalyptus mckieana</i>	-	V	Unlikely - Outside of NSW distribution - Lacks preferred soil type - No records within the Subject Land or locality

Common Name	Scientific Name	BC Act	EPBC Act	Likelihood to occur within Subject Land
Narrow-leaved Peppermint	<i>Eucalyptus nicholii</i>	-	V	Likely - Subject Land is within the distribution for the species - Potential habitat in the form of grassy eucalypt woodland - Recorded within the locality
Blackbutt Candlebark	<i>Eucalyptus rubida subsp. barbigerorum</i>	-	V	Unlikely - Outside of NSW distribution - No records within locality
Alpine Water Skink	<i>Eulamprus kosciuskoi</i>	V	V	Unlikely - Outside of NSW distribution - Lacks preferred habitat - No records within locality
-	<i>Euphrasia arguta</i>	-	CE	Potential - Subject Land is within the distribution for the species - No records within the Subject Land or locality
Grey Falcon	<i>Falco hypoleucos</i>	-	V	Unlikely - Outside of NSW distribution - Not recorded within the Subject Land or locality
Painted Honeyeater	<i>Grantiella picta</i>	-	V	Potential - Subject Land is within the distribution for the species - Potential habitat in the form of open eucalypt woodland with mistletoe present - Recorded within the locality
Beadle's Grevillea	<i>Grevillea beadleana</i>	E	E	Unlikely - Subject Land is within the distribution for the species - Lacks preferred habitat - No records within Subject Land or Locality
Gnarled Corkbark	<i>Hakea fraseri</i>	-	V	Unlikely - Subject Land is within the distribution for the species - No dry and steep rocky slopes - No records within the Subject Land or locality
Tall Velvet Sea-berry	<i>Haloragis exalata subsp. velutina</i>	-	V	Unlikely - Lacks preferred soil type - Minimal records within locality
Swift Parrot	<i>Lathamus discolor</i>	-	CE	Potential - Subject Land is within the distribution for the species - Potential habitat in the form of open eucalypt woodland
Basalt Pepper-cress	<i>Lepidium hyssopifolium</i>	-	E	Potential - Subject Land is within the distribution for the species - Suitable habitat present (grassland, grassy woodland) - Recorded within the locality

Common Name	Scientific Name	BC Act	EPBC Act	Likelihood to occur within Subject Land
Yellow-spotted Tree Frog	<i>Litoria castanea</i>	-	CE	Unlikely - Subject Land is within the distribution for the species - Lacks preferred habitat
Peppered Tree Frog	<i>Litoria piperata</i>	-	V	Potential - Subject Land is within the distribution for the species - Subject Land is within the geographic limitation for the species (above 800m altitude) - Lacks preferred habitat
Glandular Frog	<i>Litoria subglandulosa</i>	-	V	Unlikely - Subject Land is within the distribution for the species - Lacks preferred habitat
South-eastern Hooded Robin	<i>Melanodryas cucullata cucullata</i>	E	E	Potential - Subject Land is within the distribution for the species - Potential habitat in the form of open eucalypt woodland
Blue-winged Parrot	<i>Neophema chrysostoma</i>	V	V	Unlikely - Outside of NSW distribution - Not recorded within the Subject Land or locality
Yellow-bellied Glider (south-eastern)	<i>Petaurus australis australis</i>	V	V	Potential - Subject Land is within the distribution for the species - Potential foraging habitat in the form of open eucalypt woodland - No records within the locality
Brush-tailed Rock-wallaby	<i>Petrogale penicillata</i>	-	V	Unlikely - Subject Land is within the distribution for the species - Lacks preferred habitat
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)	<i>Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)</i>	-	E	Likely - Subject Land is within the distribution for the species - Potential habitat in the form of open eucalypt woodland, with preferred food trees present - Many records within the locality
Hawkweed	<i>Picris evae</i>	-	V	Unlikely - Outside of NSW distribution - No records within the Subject Land or locality
New Holland Mouse	<i>Pseudomys novaehollandiae</i>	V	V	Potential - Subject Land is within the distribution for the species - Potential habitat in the form of open eucalypt woodland

Common Name	Scientific Name	BC Act	EPBC Act	Likelihood to occur within Subject Land
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	-	V	Potential - Subject Land is within the distribution for the species - Potential foraging habitat in the form of open eucalypt woodland - Many records within the locality
Metcalfe's Greenhood	<i>Pterostylis metcalfei</i>	E	E	Unlikely - Outside of NSW distribution - Lacks preferred habitat - No records within the Subject Land or locality
Australian Painted Snipe	<i>Rostratula australis</i>	-	E	Unlikely - Subject Land is within the distribution for the species - Lacks preferred habitat
New England Leaf-tailed Gecko	<i>Saltuarius moritzi</i>	-	E	Unlikely - Within EPBC potential distribution - Subject Land lacks preferred habitat - No records within the Subject Land or locality
Diamond Firetail	<i>Stagonopleura guttata</i>	-	V	Likely - Subject Land is within the distribution for the species - Potential habitat in the form of open eucalypt woodland - Many records within the locality
Austral Toadflax	<i>Thesium australe</i>	-	V	Potential - Subject Land is within the distribution for the species - Suitable habitat present (grassland, grassy woodland) - Recorded within the locality
-	<i>Vincetoxicum woollsii</i>	-	E	Unlikely - Outside of NSW distribution - Lacks preferred habitat - No records within the Subject Land or locality

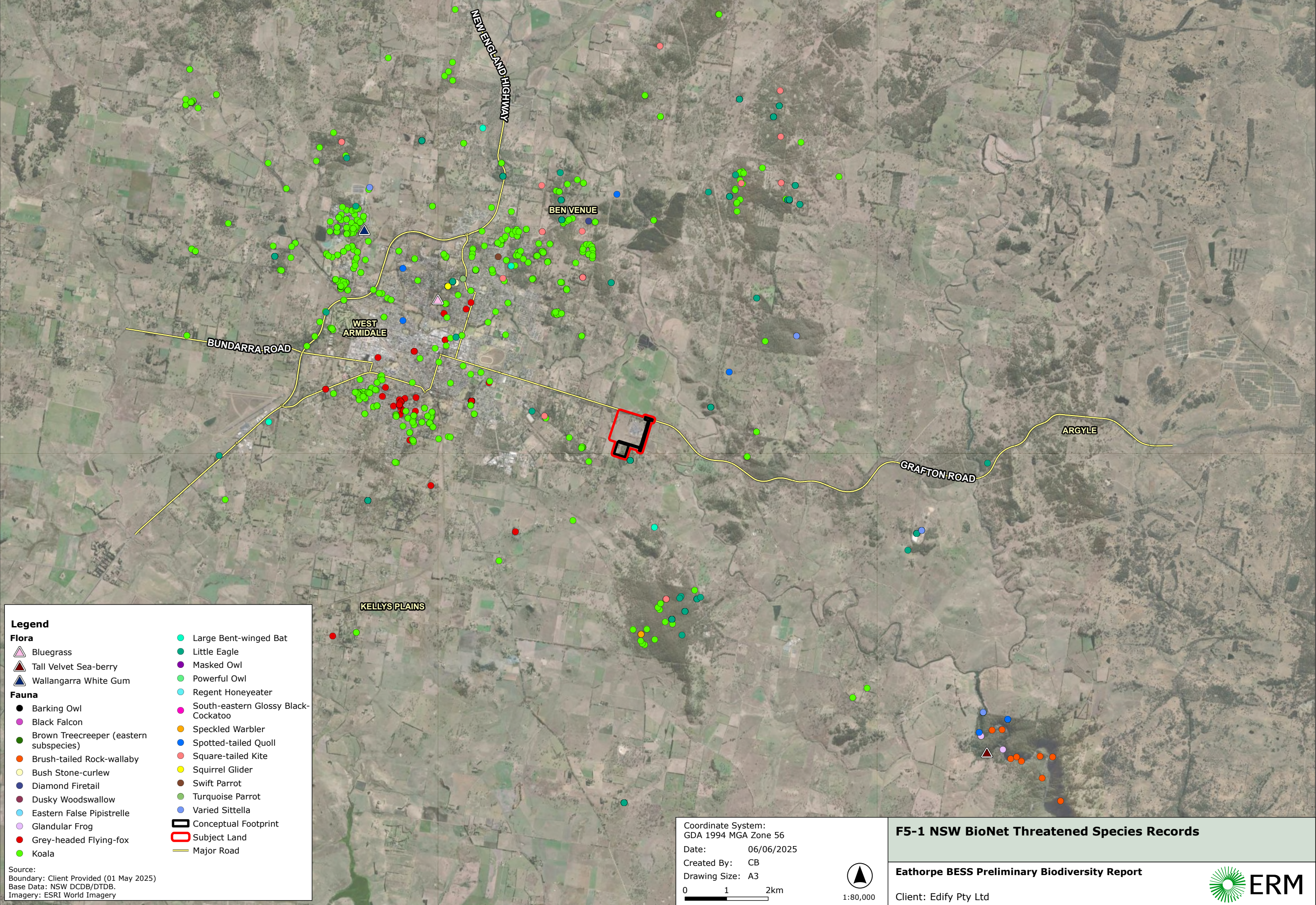
5.4 LISTED MIGRATORY MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

The PMST search identified twelve (12) EPBC Act listed migratory species with potential to occur within the Subject Land, these species are assessed in **Table 5-6**. Four (4) of these species are also listed threatened species.

TABLE 5-6 MIGRATORY SPECIES IDENTIFIED BY THE PMST

Common Name	Scientific Name	BC Act	EPBC Act	Likelihood to occur within Subject Land
Fork-tailed Swift	<i>Apus pacificus</i>	-	Mi	Potential There are no recent records in the locality, however there is suitable habitat present.

Common Name	Scientific Name	BC Act	EPBC Act	Likelihood to occur within Subject Land
Sharp-tailed Sandpiper	<i>Calidris acuminata</i>	-	V	Unlikely There are no recent records in the locality and suitable habitat is not present
Pectoral Sandpiper	<i>Calidris melanotos</i>	-	Mi	Unlikely There are no recent records in the locality and suitable habitat is not present
Common Sandpiper	<i>Actitis hypoleucos</i>	-	Mi	Unlikely There are no recent records in the locality and suitable habitat is not present
Common Greenshank	<i>Tringa nebularia</i>	-	E	Unlikely There are no recent records in the locality and suitable habitat is not present
Curlew Sandpiper	<i>Calidris ferruginea</i>	-	CE	Unlikely - No records within the Subject Land/locality - Subject Land sits outside of the distribution for the species " - No records within the Subject Land/locality - Subject Land sits outside of the distribution for the species
Yellow Wagtail	<i>Motacilla flava</i>	-	Mi	Unlikely There are no recent records in the locality and suitable habitat is not present.
White-throated Needletail	<i>Hirundapus caudacutus</i>	-	V	Unlikely - Subject Land is within the distribution for the species - Lacks preferred habitat
Latham's Snipe, Japanese Snipe	<i>Gallinago hardwickii</i>	-	V	Unlikely There are no recent records in the locality and suitable habitat is not present



6. MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

Matters of National Environmental Significance relevant to the Subject Land are provided in **Table 6-1**. Under the EPBC Act, projects that are expected to have a significant impact on MNES are required to refer the proposed action (the Project) to the Commonwealth Minister for the Environment. This process involves formal assessment and determination by the Minister. If the Minister determines the proposed action is likely to have a significant impact on MNES then the action is deemed to be controlled action under the EPBC Act.

NSW maintains a bilateral agreement with the Australian Government with regards to biodiversity. This agreement aims to establish a consistent framework for environmental assessment and approvals. This agreement allows accredited assessors in NSW to conduct assessments and approvals for state significant development projects in line with state and federal standards.

TABLE 6-1 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

MNES	Relevance to the Subject Land
World Heritage Properties	Gondwana Rainforest was identified as a World Heritage Place within the 10 km search area.
National Heritage Places	Gondwana Rainforest was identified as a National Heritage Place within the 10 km search area.
Wetlands of International Importance (Ramsar Wetlands)	There are no wetlands of international importance within the Subject Land. The closest records are greater than 100 km from the Subject Land (as identified within the PMST).
Listed Threatened Ecological Communities (TECs)	Three (3) EPBC Act TECs were identified within the PMST as having the potential to occur within the Subject Land. These TECs include: • New England Peppermint (<i>Eucalyptus nova-anglica</i>) Grassy Woodlands; • Upland Wetlands of the New England Tablelands (New England Tableland Bioregion) and the Monaro Plateau (South Eastern Highlands Bioregion); and • White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland. The presence of White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland has been confirmed. No other EPBC Act TECs occur within the Subject Land.
Listed Threatened Species	Four (4) EPBC Act listed species are considered likely to occur based on records in the locality and the presence of preferred habitat: • Koala (<i>Phascolarctos cinereus</i>) (Endangered); • Narrow-leaved Black Peppermint (<i>Eucalyptus nicholii</i>) (Vulnerable); • Brown Treecreeper (<i>Climacteris picumnus victoricae</i>) (Vulnerable); • Diamond Firetail (<i>Stagonopleura guttata</i>) (Vulnerable).
Listed Migratory Species	No birds listed as Migratory under the EPBC Act have been identified on the Subject Land, nor been considered known or likely to occur within the Subject Land based on the Likelihood of Occurrence Assessment.
Great Barrier Reef Marine Park	Not identified within the Subject Land or within 50 km radius.

7. NEXT STEPS

The Project will require the preparation of a BDAR as part of the SEARs. This will require completion of Stage 1 and Stage 2 of the BAM. The following sections generally outline the future scope of these works.

7.1 STAGE 1 OF THE BAM

Stage 1 of the BAM requires that additional survey periods be completed to inform the Project BDAR. The project BDAR will then document the methods and results of these survey efforts and how they adhere to the relevant survey guidelines. Relevant survey guidelines in force at the time of this PBR include:

- Koala (*Phascolarctos cinereus*) Biodiversity Assessment Method Survey Guide (DPE, 2022);
- 'Species credit' threatened bats and their habitats, NSW survey guide for the Biodiversity Assessment Method (OEH, 2018);
- Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities (Working Draft) (DEC, 2004);
- Survey Guidelines for Australia's Threatened Mammals (DSEWPC, 2011);
- NSW Survey Guide for Threatened Frogs: A guide for the survey of threatened frogs and their habitats for the Biodiversity Assessment Method (DPIE, 2020b);
- Surveying Threatened plants and their habitats - NSW survey guide for the Biodiversity Assessment Method (DPIE, 2020b); and
- Threatened reptiles Biodiversity Assessment Method survey guide (Department of Planning and Environment , 2022).

7.1.1 FURTHER SURVEYS

The remaining investigations include the following:

- Site walkover to ensure conditions since the 2022-23 surveys have not changed within Subject Land;
- Additional BAM plot data to further delineate vegetation zones and confirm VIS;
- Review of Candidate Species list following confirmation of PCT mapping; and
- Conduct targeted surveys for updated Candidate Species list (currently only *Caladenia amnicola* has been added since 2023).

7.2 STAGE 2 OF THE BAM

Application of Stage 2 of the BAM aims to determine how the Project will meet the "No Net Loss" standard required by the NSW BC Act and support net positive biodiversity outcomes to be delivered as per the Biodiversity Conservation Amendment (Biodiversity Offsets Scheme) Bill 2024. This calculation depends on the extent of biodiversity values being impacted, whether the impact is direct, indirect or prescribed. These impacts are to be assessed following application of the mitigation hierarchy (avoid, minimise, mitigate). Therefore, allowing for the quantification of residual impacts.

The BAM is then used to calculate the offset liability of the Project in units referred to as biodiversity credits. A biodiversity offset strategy will be defined to demonstrate how this offset is to be delivered, this defines the “No Net Loss” for the proposed Project.

7.2.1 APPLICATION OF THE MITIGATION HIERARCHY

This PBR has identified the biodiversity constraints on the proposed Project that will require consideration and application of the mitigation hierarchy. Impacts on native vegetation and threatened species should be avoided as a priority. The following principles are to be considered in the application of the mitigation hierarchy:

Avoid:

- Areas of mapped TECs;
- Areas that contain identified biodiversity values such as habitat features; and
- Areas of mapped native vegetation.

Minimise:

- The risk for weed and pest incursion on the Subject Land; and
- The risk of injury to fauna.

Mitigate:

- Mitigate any residual impacts to biodiversity. This should be achieved through conservation and improvement of existing native vegetation on the Subject Land.

7.2.2 OFFSET STRATEGY

If deemed to be required, an offset strategy would need to demonstrate a ‘no net loss’ outcome and may comprise one or more of the following:

- Retirement of suitable ecosystem and species credits registered in the BOS including payment into the Biodiversity Conservation Trust fund;
- Contribution to a conservation initiative; and/or
- Implementation of a voluntary planning agreement (s7.18 of the BC Act).

The Minister may also consider Ancillary Rules in lieu of retiring biodiversity credits as well as any additional and appropriate measures that will minimise those impacts if consent or approval is to be granted for impacts on entities at risk of serious and irreversible impacts (s7.16(3) of the BC Act).

A BDAR prepared in accordance with the BAM is expected to be provided as a part of the EIS and will have regard for the PCTs and BAM-C generated candidate species identified in this PBR, including consideration of SAI entities. This is to be used to assess the impact of the Project on assessable biodiversity values. The Project BDAR will comprise the survey methods and results and an assessment of impacts associated with the Project. It will also outline the offset strategy for any residual impacts as a result of the Project.

8. REFERENCES

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APPENDIX A PMST RESULTS



Australian Government

Department of Climate Change, Energy,
the Environment and Water

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 07-May-2025

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	1
National Heritage Places:	1
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	51
Listed Migratory Species:	9

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	41
Commonwealth Heritage Places:	2
Listed Marine Species:	20
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	3
Regional Forest Agreements:	1
Nationally Important Wetlands:	None
EPBC Act Referrals:	8
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

World Heritage Properties			[Resource Information]
Name	State	Legal Status	Buffer Status
Gondwana Rainforests of Australia	QLD	Declared property	In buffer area only

National Heritage Places			[Resource Information]
Name	State	Legal Status	Buffer Status
Natural			
Gondwana Rainforests of Australia	NSW	Listed place	In buffer area only

Listed Threatened Ecological Communities			[Resource Information]
For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.			
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.			

Community Name	Threatened Category	Presence Text	Buffer Status
New England Peppermint (Eucalyptus nova-anglica) Grassy Woodlands	Critically Endangered	Community likely to occur within area	In feature area
Upland Wetlands of the New England Tablelands (New England Tableland Bioregion) and the Monaro Plateau (South Eastern Highlands Bioregion)	Endangered	Community likely to occur within area	In buffer area only
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area	In feature area

Listed Threatened Species			[Resource Information]
Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.			
Number is the current name ID.			
Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Anthochaera phrygia			
Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Aphelocephala leucopsis			
Southern Whiteface [529]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat known to occur within area	In feature area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat known to occur within area	In feature area
Erythroriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat may occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat known to occur within area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat may occur within area	In buffer area only
CRUSTACEAN			
Euastacus simplex Simple Crayfish, Small Mountain Crayfish [83156]	Endangered	Species or species habitat may occur within area	In feature area
FROG			
Litoria castanea Yellow-spotted Tree Frog, Yellow-spotted Bell Frog [1848]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Litoria piperata Peppered Tree Frog [1827]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Litoria subglandulosa New England Tree Frog, Glandular Frog [1807]	Vulnerable	Species or species habitat known to occur within area	In feature area
MAMMAL			
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Endangered	Species or species habitat may occur within area	In feature area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Petrogale penicillata Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat known to occur within area	In feature area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area	In feature area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour may occur within area	In feature area
PLANT			
Arthraxon hispidus Hairy-joint Grass [9338]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Bertya sp. Clouds Creek (M.Fatemi 4) [84675]	Endangered	Species or species habitat may occur within area	In feature area
Callistemon pungens [55581]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Cynanchum elegans White-flowered Wax Plant [12533]	Endangered	Species or species habitat may occur within area	In buffer area only
Dichanthium setosum bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Diuris eborensis [88275]	Endangered	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Eucalyptus mckieana McKie's Stringybark [20199]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Eucalyptus nicholii Narrow-leaved Peppermint, Narrow-leaved Black Peppermint [20992]	Vulnerable	Species or species habitat known to occur within area	In feature area
Eucalyptus rubida subsp. barbigerorum Blackbutt Candlebark [64618]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Euphrasia arguta [4325]	Critically Endangered	Species or species habitat may occur within area	In feature area
Grevillea beadleana Beadle's Grevillea [22002]	Endangered	Species or species habitat may occur within area	In buffer area only
Hakea fraseri Gnarled Corkbark, Fraser's Hakea [16093]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Haloragis exalata subsp. velutina Tall Velvet Sea-berry [16839]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Lepidium hyssopifolium Basalt Pepper-cress, Peppercress, Rubble Pepper-cress, Pepperweed [16542]	Endangered	Species or species habitat may occur within area	In buffer area only
Picris evae Hawkweed [10839]	Vulnerable	Species or species habitat may occur within area	In feature area
Pterostylis metcalfei Metcalf's Greenhood [65908]	Endangered	Species or species habitat may occur within area	In buffer area only
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Vincetoxicum woollsii listed as Tylophora woollsii [40080]	Endangered	Species or species habitat may occur within area	In buffer area only
REPTILE			
Anomalopus mackayi Five-clawed Worm-skink, Long-legged Worm-skink [25934]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Aprasia parapulchella Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat may occur within area	In feature area
Eulamprus kosciuskoi Alpine Water Skink [59693]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Saltuarius moritzi New England Leaf-tailed Gecko, Moritz's Leaf-tailed Gecko [89490]	Endangered	Species or species habitat known to occur within area	In feature area
Listed Migratory Species [Resource Information]			
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat may occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Commonwealth Lands		[Resource Information]
The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.		
Commonwealth Land Name	State	Buffer Status
Communications, Information Technology and the Arts - Australian Postal Corporation		
Commonwealth Land - Australian Postal Commission [16282]	NSW	In buffer area only
Commonwealth Land - Australian Postal Corporation [11644]	NSW	In buffer area only
Communications, Information Technology and the Arts - Telstra Corporation Limited		
Commonwealth Land - Australian Telecommunications Commission [16490]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [16281]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11634]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11645]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [16527]	NSW	In buffer area only
Defence - Defence Housing Authority		
Commonwealth Land - Defence Housing Authority [16432]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15502]	NSW	In buffer area only
Unknown		

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [16378]	NSW	In buffer area only
Commonwealth Land - [16379]	NSW	In buffer area only
Commonwealth Land - [16376]	NSW	In buffer area only
Commonwealth Land - [16377]	NSW	In buffer area only
Commonwealth Land - [16374]	NSW	In buffer area only
Commonwealth Land - [16373]	NSW	In buffer area only
Commonwealth Land - [16375]	NSW	In buffer area only
Commonwealth Land - [16372]	NSW	In buffer area only
Commonwealth Land - [16370]	NSW	In buffer area only
Commonwealth Land - [16371]	NSW	In buffer area only
Commonwealth Land - [16390]	NSW	In buffer area only
Commonwealth Land - [16391]	NSW	In buffer area only
Commonwealth Land - [16392]	NSW	In buffer area only
Commonwealth Land - [16393]	NSW	In buffer area only
Commonwealth Land - [16394]	NSW	In buffer area only
Commonwealth Land - [16396]	NSW	In buffer area only
Commonwealth Land - [16395]	NSW	In buffer area only
Commonwealth Land - [16383]	NSW	In buffer area only
Commonwealth Land - [16382]	NSW	In buffer area only
Commonwealth Land - [16381]	NSW	In buffer area only
Commonwealth Land - [16368]	NSW	In buffer area only
Commonwealth Land - [16369]	NSW	In buffer area only
Commonwealth Land - [16397]	NSW	In buffer area only
Commonwealth Land - [16366]	NSW	In buffer area only
Commonwealth Land - [16367]	NSW	In buffer area only
Commonwealth Land - [16388]	NSW	In buffer area only
Commonwealth Land - [16389]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [16384]	NSW	In buffer area only
Commonwealth Land - [16385]	NSW	In buffer area only
Commonwealth Land - [16386]	NSW	In buffer area only
Commonwealth Land - [16387]	NSW	In buffer area only
Commonwealth Land - [16380]	NSW	In buffer area only

Commonwealth Heritage Places			[Resource Information]
Name	State	Status	Buffer Status
Historic			
Armidale Post Office	NSW	Listed place	In buffer area only
Hunter River Lancers Training Depot	NSW	Listed place	In buffer area only

Listed Marine Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat likely to occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area overfly marine area	In feature area
Pterodroma cervicalis White-necked Petrel [59642]		Species or species habitat may occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat may occur within area overfly marine area	In buffer area only

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Imbota	Nature Reserve	NSW	In buffer area only
Oxley Wild Rivers	National Park	NSW	In buffer area only
Yina	Nature Reserve	NSW	In buffer area only

Regional Forest Agreements	[Resource Information]
Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.	

RFA Name	State	Buffer Status
North East NSW RFA	New South Wales	In feature area

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Gara Battery Energy Storage System	2025/10102		Referral Decision	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Armidale Regional Landfill	2007/3646	Controlled Action	Post-Approval	In buffer area only
Not controlled action				
Development of residential lots, Link Road	2007/3375	Not Controlled Action	Completed	In buffer area only
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Private residential development on Lot 2 DP 500453 Stoney Ridge Road	2004/1682	Not Controlled Action	Completed	In buffer area only
Residential Subdivision & Assoc Infrastructure Kareela Road	2005/2102	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
Aerial baiting for wild dog control	2006/2713	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Proposed subdivision/residential development	2007/3605	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only

Caveat

1 PURPOSE

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

The report contains the mapped locations of:

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

2 DISCLAIMER

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

Where data is available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on the contents of this report.

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions when time permits.

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded breeding sites; and
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
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- [-South Australian Museum](#)
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- [-National Herbarium of NSW](#)
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The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

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APPENDIX B BAT CALL ANALYSIS

Bat Call Analysis Report

Eathorpe BESS Project

Prepared for ERM

Prepared by:

The logo for Green Tape SOLUTIONS, featuring the words "Green Tape" in a large, green, cursive script font, with the word "SOLUTIONS" in a smaller, green, sans-serif, all-caps font centered underneath.

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Document Records - Quality

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Table of Content

1.0 INTRODUCTION	1
1.1 BACKGROUND.....	1
1.2 SCOPE OF WORK.....	1
2.0 METHODOLOGY	2
2.1 CAPTURE TECHNIQUE.....	2
2.2 CALL IDENTIFICATION	2
2.3 NATIONAL STANDARD	2
3.0 RESULTS.....	3
3.1 TOTAL SPECIES RECORDED	3
3.2 SAMPLES OF CALLS / SEQUENCES FILES	4
4.0 CONCLUSION	12
5.0 REFERENCES	13

TABLES

Table 1: Summary of bat call analysis.....	3
---	----------

FIGURES

Figure 1: <i>Austronomus australis</i>	4
Figure 2: <i>Chalinolobus gouldii</i>	4
Figure 3: <i>Falsistrellus tasmaniensis</i>	5
Figure 4: <i>Miniopterus australis</i>	6
Figure 5: <i>Miniopterus orianae oceanensis</i>	6
Figure 6: <i>Myotis macropus</i>	7
Figure 7: <i>Nyctophilus spp</i>	7
Figure 8: <i>Ozimops planiceps</i>	8
Figure 9: <i>Ozimops ridei</i>	8
Figure 10: <i>Scoteanax rueppellii</i>	8
Figure 11: <i>Scotorepens greyii</i>	9
Figure 12: <i>Vespadelus darlingtoni</i>	9
Figure 13: <i>Vespadelus regulus</i>	10
Figure 14: <i>Vespadelus vulturnus</i>	10
Figure 15: <i>Vespadelus troughtoni</i>	11

I.0 Introduction

I.1 Background

Green Tape Solutions were commissioned to undertake bat call analysis for the BESS project located near Armidale in New South Wales.

I.2 Scope of Work

The specific scope of works for this report includes the following:

- Outline the methodology used to analyse the microbat call within the subject site; and,
- Present the findings of all of the bat call surveys conducted at the project site;

2.0 Methodology

2.1 Capture Technique

Microbat calls were sampled using one bat detector. Passive monitoring was undertaken from 16-20 January 2023. The original call files display Australian Eastern Standard Time. The data was analysed using Anabat Insight.

Monitoring commenced at dusk (approximately 1800 hours) and continued until dawn (approximately 0530 hours). Ultrasonic call monitoring surveys on anabat detectors were conducted using full-spectrum fitted with omnidirectional ultrasonic microphone.

2.2 Call Identification

Anabat recordings were analysed using Anabat software (Anabat Insight). Identifications were made by categorising call shape and frequency, with a species match given in consideration to region, known bat distributions, and habitats present. The focus of the bat surveys was to assess the presence of bat species found within the Project Area, and to assess the potential for rare and threatened species to occur.

Call identification for this dataset was based on call keys and descriptions published for Queensland (Reinhold *et al.*, 2001) and New South Wales (Pennay *et al.*, 2004).

Species' identification was further refined using the probability of occurrence of each species based on their geographic distribution (Churchill, 2008, Van Dyck and Strahan, 2008). Species nomenclature used in this report follows Churchill (2008).

The reliability of identification is as follows:

- **Definite** - one or more calls where there is no doubt about the identification of the species;
- **Probable** - most likely to be the species named, low probability of confusion with species that use similar calls; and,
- **Possible** - call is comparable with the named species, with a moderate to high probability of confusion with species of similar calls.

2.3 National Standard

The format and content of this report complies with the nationally accepted standards for the interpretation and reporting of Anabat and Songmeter data (Reardon, 2003), which is currently available from the Australasian Bat Society at www.ausbats.org.au.

3.0 Results

3.1 Total Species Recorded

The majority of calls were considered to be of medium to good quality calls.

A total of 1,299 sequence files were analysed. A proportion of these files (116) in this dataset contained background noise or resulted in poor quality calls that did not provide bat calls for analysis. While some call sequences were recognised as bat calls, the quality was not sufficient to assign species identification.

A summary of the species identified through bat call analysis is provided in **Table 1**.

Table 1: Summary of bat call analysis

Species	Biodiversity Act	EPBC Act	SD001
<i>Austronomus australis</i>	LC	NOC	Definite
<i>Chalinolobus gouldii</i>	LC	NOC	Definite
<i>Falsistrellus tasmaniensis</i>	LC	NOC	Probable
<i>Miniopterus australis</i>	V	NOC	Definite
<i>Miniopterus orianae oceanensis</i>	V	NOC	Probable
<i>Myotis macropus</i>	LC	NOC	Possible
<i>Nyctophilus geoffroyi</i>	LC	NOC	Possible
<i>Nyctophilus gouldi</i>	LC	NOC	Possible
<i>Ozimops planiceps</i>	LC	NOC	Possible
<i>Ozimops ridei</i>	LC	NOC	Possible
<i>Scoteanax rueppellii</i>	V	NOC	Definite
<i>Scotorepens greyii</i>	LC	NOC	Definite
<i>Vespadelus darlingtoni</i>	LC	NOC	Probable
<i>Vespadelus regulus</i>	LC	NOC	Probable
<i>Vespadelus troughtoni</i>	V	NOC	Probable
<i>Vespadelus vulturnus</i>	LC	NOC	Possible

LC: Least Concern, NOC: Not of Concern, V: Vulnerable

3.2 Samples of Calls / Sequences Files

Samples of call extracted from the dataset for each species identified is provided in the following figures

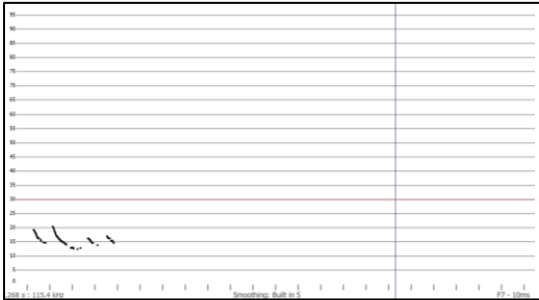
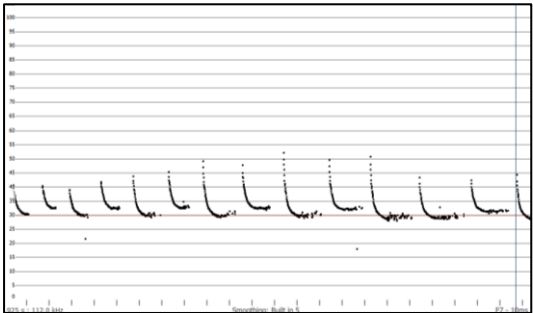
Species	Calls	Known distribution (Extract from Ausbats maps from Australian Bat Society)
Figure 1: <i>Austronomus australis</i> Definite call. This bat is easily recognised by its constant frequency calls range in bandwidth from 10.5 to 15 kHz (Pennay <i>et al.</i>, 2004).		
Figure 2: <i>Chalinolobus gouldii</i> Definite call. This species has a curved shape call with characteristic frequency 28 to 34kHz. Pulse alternates in frequency and mostly down-sweeping tail or no tail.		

Figure 3: *Falsistrellus tasmaniensis*

Probable call.

Curved and usually steep, but can be variable in shape, most pulses do not have an up-sweeping tail.

Characteristic frequency 35 to 39.5 kHz (n = 14). Can be separated from *Scotorepens* sp. (Parnaby, 1992) and *S. greyii* by lack of up-sweeping tail on most pulses. Also, most of the time the pre-characteristic section of *F. tasmaniensis* is longer than the characteristic section + tail. Except for when the drop in frequency of the pre-characteristic section is greater than 3 kHz or the characteristic frequency is 38 to 39.5 kHz, cannot be distinguished from *S. orion*. *F. tasmaniensis* has a shorter pre-characteristic section than *S. rueppellii*, although these two species can be difficult to separate when *F. tasmaniensis* is lower than 36 kHz.

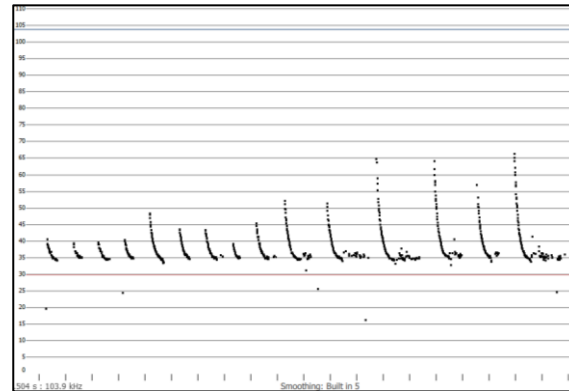


Figure 4: *Miniopterus australis*

Definite call.

This species displays a characteristic frequency between 54.5 – 64.5 kHz with a curved, usually down-sweeping tail (Pennay *et al* 2004).

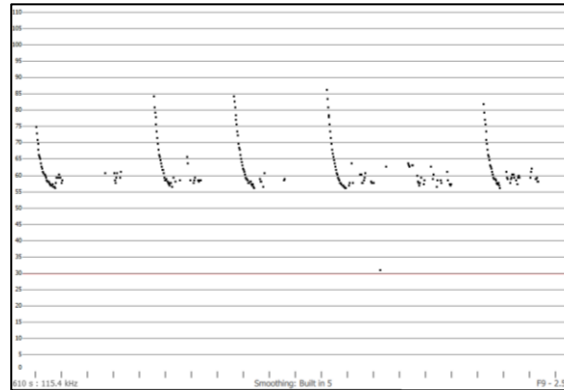


Figure 5: *Miniopterus orianae oceanensis*

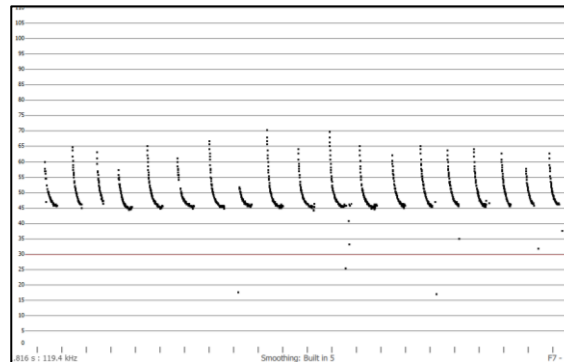
Probable call.

The species call is characterised by its long curved pulse with a small down-sweeping tail and its frequency between 43-47kHz (Reinhold, 2001).

125 calls that could be allocated to this species were recorded on this site.

Longer duration with no tail or relatively short up-sweeping tail, cannot be distinguished from *Vespadelus darlingtoni* at the same frequency (Reinhold, 2001).

Shorter duration, can be distinguished from *V. darlingtoni*, *V. regulus* and *V. vulturnus* by having a longer pre-characteristic section (drop in frequency usually greater than 2 kHz) and most pulses do not have an up-sweeping tail (Reinhold, 2001). Pulse



shape and time between calls can be quite variable within a sequence (Reinhold, 2001).

Figure 6: *Myotis macropus*

Possible call.

Near-vertical pulse dropping to about 30 to 35-50kHz. *M. macropus* mostly have a pulse interval of less than 75ms and usually have one kink close to the middle so that the second part has a lesser slope than the first (Reinhold, 2001).

This call can be confused with *Nyctophilus spp* calls. The latest have usually a pulse interval greater than 95ms and are slightly more complicated structure with two kinks instead of one.

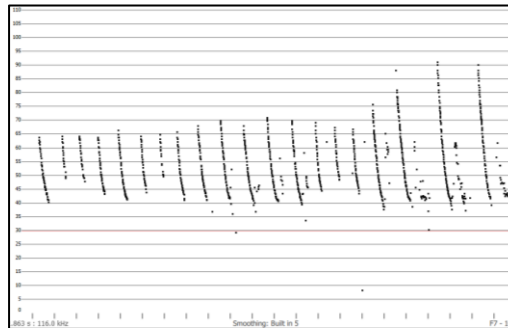
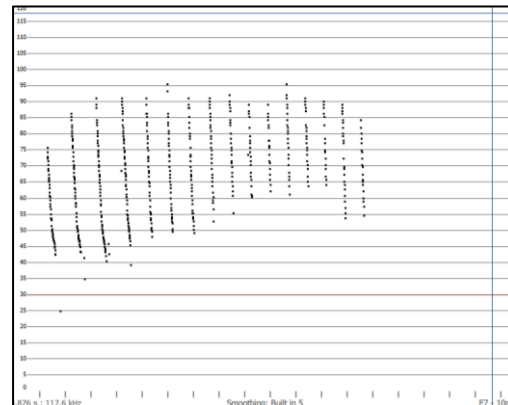


Figure 7: *Nyctophilus spp*

Possible call.

This species displays a near-vertical pulse, characteristic frequency between 80 and 35KHz (Pennay *et al*, 2004).

The species from this genus cannot be distinguished from each other. There are 2 species of *Nyctophilus* that are known to occur in the project area.



N. geoffroyi



N. gouldi

Figure 8: *Ozimops planiceps*

Possible call.

This bat calls are flat and its characteristic is between 24 and 29 kHz.

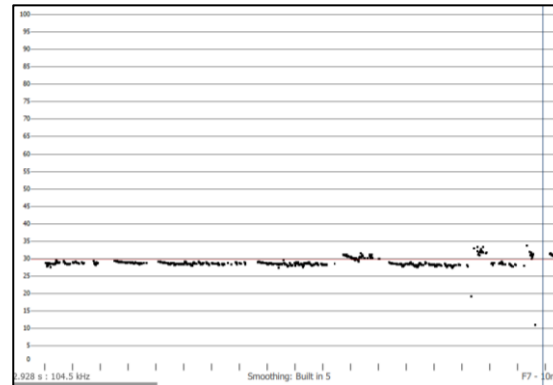


Figure 9: *Ozimops ridei*

Possible call.

O. ridei calls are flat and sometimes a bit curved with frequency a bit lower than 30kHz. Characteristic frequency of this species is between 28 to 36 kHz.

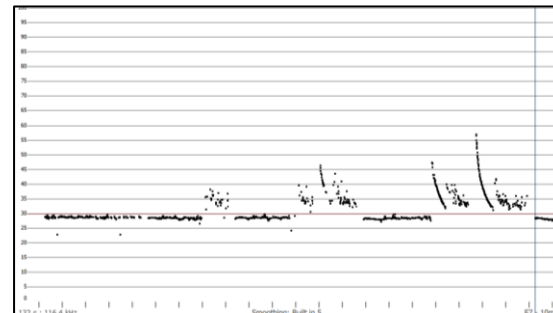
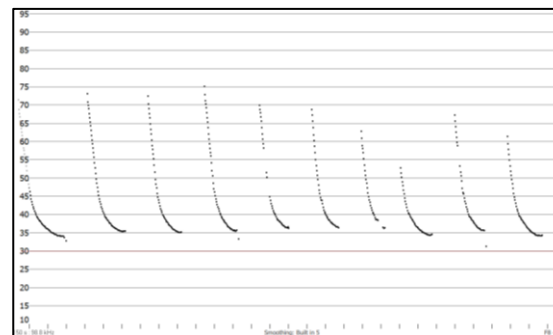


Figure 10: *Scoteanax rueppellii*

Probable call.

Curved call without tail and a characteristic frequency varying between 33 to 36 kHz. Frequency of the knee higher than 37 kHz. Pre-characteristic section drops over more than 3 kHz. This feature mostly distinguishes it from *Scotorepens* spp.



Some *Falsistrellus tasmaniensis* have a pre-characteristic section drop of greater than 3 kHz, so for calls higher than 35 kHz characteristic frequency, these two species are difficult to be distinguished.

Figure 11: *Scotorepens greyii*

Probable call.

S. greyii has a curved and up-sweeping tail pulse. Its characteristic frequency is between 36 to 41.5 kHz. The up-sweeping tail and time of characteristic section + tail exceeding time of pre-characteristic section will distinguish this from *Falsistrellus tasmaniensis* most of the time.

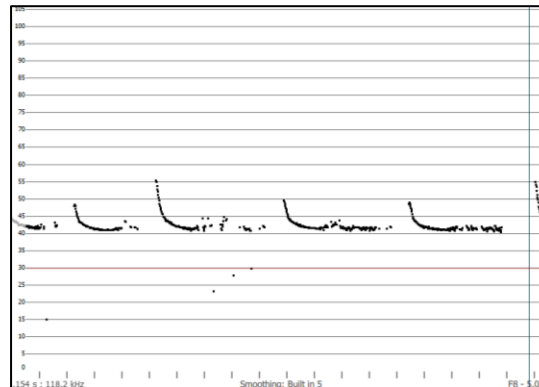


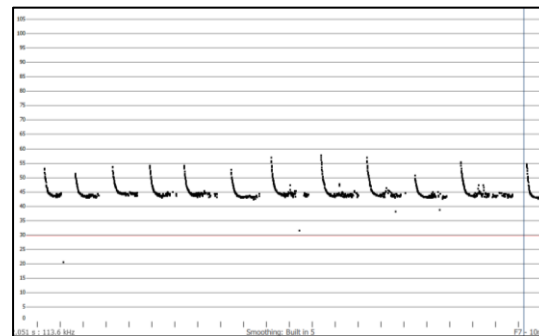
Figure 12: *Vespadelus darlingtoni*

Probable call.

This species call has a curved call with no tail or sometime an up-sweeping tail. The call's characteristic frequency is between 42.5 to 48.5 kHz. Characteristic section is often, but not always, relatively long.

Shorter duration with up-sweeping tails and higher frequencies, cannot be distinguished from *V. regulus*.

Distinguished from *Miniopterus schreibersii*



oceanensis by having consecutive pulses even, and lacking down-sweeping tails.

Figure 13: *Vespadelus regulus*

Possible call.

Characteristic frequency varies significantly over distribution from 40 to 55 kHz. Characteristic frequency 45 to 47 kHz. Curved with up-sweeping tail. Cannot be differentiated to other *Vespadelus* sp.

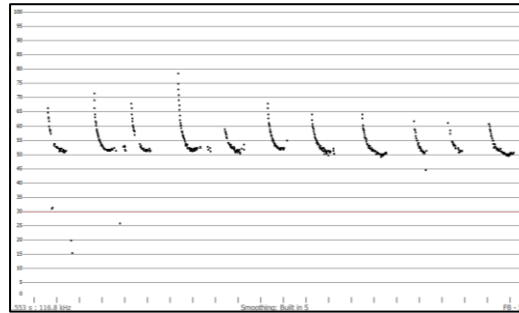


Figure 14: *Vespadelus vulturnus*

Possible call.

Curved and up-sweeping tail calls with characteristic frequency between 45 to 53 kHz.

It cannot be distinguished from *V. regulus*, or some *V. darlingtoni* when up-sweeping tail.

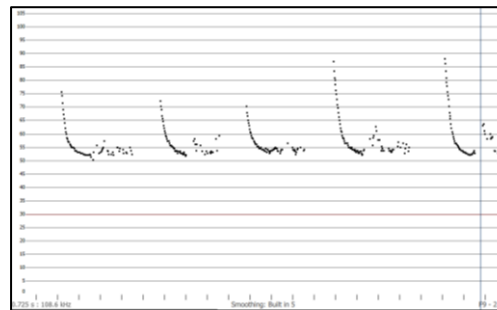
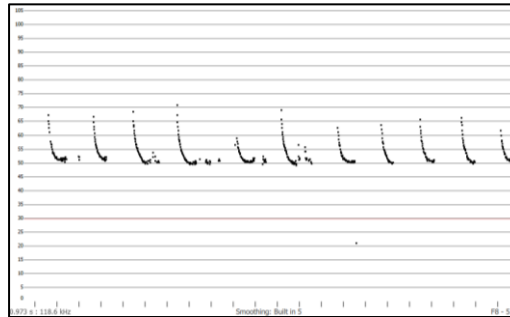


Figure 15: *Vespadelus troughtoni*

Possible call.

This species displays a curved pulse with not prominent up-sweeping tail. Its characteristic frequency is between 48.5 to 55 kHz (Pennay *et al*, 2004). If the end, frequency is lower than 51 kHz, then the call can be identified to *V. troughtoni*.



4.0 Conclusion

A total of 16 microbat species were either confirmed 'definite', 'probable' or 'possible' within the Project area. Most of the bats identified on the site were expected to be present within the region.

A total of four threatened species under the BC Act are recorded on site:

- *Miniopterus australis* (Definite)
- *Miniopterus orianae oceanensis* (Probable)
- *Scoteanax rueppellii* (Probable)
- *Vespadelus troughtoni* (Possible) could not be distinguished from the other *Vespadelus* species calls.

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APPENDIX C BAM PLOT DATA

Site Sheet #	BAM01	Date	13/06/2022	Recorders	Lorena Boyle and John Hunter
Coordinates	30.538498S, 151.709995E			Orientation of midline	283
PCT	PCT 567_moderate				

Tree stem class size	count	stems with hollows
80 + cm	1	
50 – 79 cm	2	1
30 – 49 cm	6	
20 – 29 cm	1	
10 – 19 cm	3	
5 – 9 cm	1	
Tree regeneration	28	
Length of Fallen Logs (m)		0

Vegetation Integrity Function				
Subplots	Litter cover (%)	Bare ground cover	Cryptogram cov	Rock Cover(%)
5	10	0	5	5
15	10	0	2	2
25	90	0	2	2
35	20	5	0	0
45	2	0	0	0
Average	26.4	1	1.8	1.8

[illegible]

Site Sheet #	BAM02	Date	13/06/2022	Recorders	Lorena Boyle and John Hunter
Coordinates	30.536468S, 151.708783E			Orientation of midline	324NW
PCT	567 moderate				

Tree stem class size	count	stems with hollows
80 + cm	0	
50 – 79 cm	2	
30 – 49 cm	3	
20 – 29 cm	4	
10 – 19 cm	10	
5 – 9 cm	2	
Tree regeneration	25	
Length of Fallen Logs (m)	5	

Vegetation Integrity Function	
Subplots	Litter cover (%)
5	30
15	2
25	5
35	2
45	2
Average	8.2

[illegible]

Site Sheet #	BAM05	Date		Recorders	Lorena Boyle and John Hunter
Coordinates	30.536625S, 151.709720E			Orientation of midline	74E
PCT	567 Moderate				

Tree stem class size	count	stems with hollows
80 + cm	0	
50 – 79 cm	2	
30 – 49 cm	1	
20 – 29 cm	1	
10 – 19 cm	9	
5 – 9 cm	7	
Tree regeneration	29	
Length of Fallen Logs (m)	0	

Vegetation Integrity Function	
Subplots	Litter cover (%)
5	0
15	0
25	0
35	0
45	0
Average	0

[illegible]

Site Sheet #	BAM06	Date	13/06/2022	Recorders	Lorena Boyle and John Hunter
Coordinates	30.537005S, 151.711740E			Orientation of midline	107E
PCT	567_Moderate				

Tree stem class size	count	stems with hollows
80 + cm	0	
50 – 79 cm	0	
30 – 49 cm	8	
20 – 29 cm	9	
10 – 19 cm	11	
5 – 9 cm	1	
Tree regeneration	0	
Length of Fallen Logs (m)	0	

Vegetation Integrity Function				
Subplots	Litter cover (%)	Bare ground cover	Cryptogram cov	Rock Cover(%)
5	5	0	0	0
15	5	0	0	0
25	25	0	0	0
35	0	0	0	0
45	2	0	0	0
Average	7.4	0	0	0

Vegetation					
Taxon	Cover	Abundance	OEI Live Form	Status	High Threat Weed
Amaranthus powellii	1	10		Introduced	
Bidens pilosa	1	10		Introduced	1
Conyza bonariensis	1	20		Introduced	
Dactylis glomerata	12	100		Introduced	
Festuca pratensis	2	20		Introduced	
Hypochaeris radicata	1	50		Introduced	
Lepidium africanum	2	100		Introduced	
Paronychia brasiliensis	1	100		Introduced	
Paspalum dilatatum	1	10		Introduced	1
Plantago lanceolata	2	100		Introduced	
Rytidosperma racemosum	2	50		Native	
Solanum nigrum	1	10		Introduced	
Sonchus oleraceus	1	5		Introduced	
Calotis cuneifolia	1	20	F	Native	
Dianella revoluta	1	1	F	Native	
Dichondra repens	1	20	F	Native	
Euchiton sphaericus	1	10	F	Native	
Solanum americanum	1	10	F	Native	
Wahlenbergia communis	1	10	F	Native	
Bothriochloa decipiens	20	200	G	Native	
Carex inversa	2	50	G	Native	
Cynodon dactylon	1	20	G	Native	
Cyperus gracilis	2	100	G	Native	
Eragrostis leptostachya	3	100	G	Native	
Microlaena stipoides	40	500	G	Native	
Paspalidium gracile	1	10	G	Native	
Poa sieberiana	1	10	G	Native	
Sporobolus creber	15	200	G	Native	
Acacia ulicifolia	1	1	S	Native	
Bursaria spinosa subsp. spinosa	3	5	S	Native	
Indigofera adesmiifolia	1	1	S	Native	
Lissanthe strigosa	2	20	S	Native	
Eucalyptus caliginosa	30	16	T	Native	

Site Sheet #	BAM07	Date	13/06/2022	Recorders	Lorena Boyle and John Hunter
Coordinates	30.537415S, 151.712430E			Orientation of midline	170S
PCT	567 Grassy Low				

Tree stem class size	count	stems with hollows
80 + cm	0	
50 – 79 cm	0	
30 – 49 cm	0	
20 – 29 cm	0	
10 – 19 cm	0	
5 – 9 cm	0	
Tree regeneration	0	
Length of Fallen Logs (m)	0	

Vegetation Integrity Function	
Subplots	Litter cover (%) Bare ground cover (%) Cryptogram cov (%) Rock Cover (%)
5	0 0 0 0
15	0 0 0 0
25	0 0 0 0
35	0 0 0 0
45	0 0 0 0
Average	0 0 0 0

[illegible]



APPENDIX D LIKELIHOOD OF OCCURRENCE



TABLE D-1 LIKELIHOOD OF OCCURRENCE

Scientific Name	Common Name	BC Act	EPBC Act	PMST	Likelihood of Occurrence
-	<i>Caladenia amnicola</i>	E	-		Unlikely • Subject land is within the distribution of the species • Lacks rocky habitat and <i>Leptospermum brevipes</i> within the Subject Land
-	<i>Callistemon pungens</i>	-	V	Y	Unlikely • Subject Land is within the distribution for the species • Lacks rocky watercourses habitat • No records within the Subject Land or locality
Austral Toadflax	<i>Thesium australe</i>	V	V	Y	Potential • Subject Land is within the distribution for the species • Suitable habitat present (grassland, grassy woodland) • Recorded within the locality
Barking Owl	<i>Ninox connivens</i>	V	-		Potential • Subject Land is within the distribution for the species • Potential habitat in the form of open eucalypt woodland • Recorded within the locality
Black Falcon	<i>Falco subniger</i>	V	-		Potential • Subject Land is within the distribution for the species • Potential habitat in the form of grassy woodland • Recorded within the locality
Black-chinned Honeyeater (eastern subspecies)	<i>Melithreptus gularis gularis</i>	V	-		Potential • Subject Land is within the distribution for the species • Potential habitat in the form of open eucalypt woodland • Recorded within the locality
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>	E	-		Unlikely • Subject Land is within the distribution for the species • Lacks preferred habitat
Bluegrass	<i>Dichanthium setosum</i>	V	V	Y	Potential • Subject Land is within the distribution for the species • Associated species present – <i>E. albens</i>, <i>E. melliodora</i> • Recorded within the locality



Scientific Name	Common Name	BC Act	EPBC Act	PMST	Likelihood of Occurrence
Brown Treecreeper (eastern subspecies)	<i>Climacteris picumnus victoriana</i>	V	V	Y	Likely - Subject Land is within the distribution for the species - Potential habitat in the form of open eucalypt woodland - Many records within the locality
Brush-tailed Rock-wallaby	<i>Petrogale penicillata</i>	E	V	Y	Unlikely - Subject Land is within the distribution for the species - Lacks preferred habitat
Bush Stone-curlew	<i>Burhinus grallarius</i>	E	-		Potential - Subject Land is within the distribution for the species - Potential habitat in the form of open eucalypt woodland
Diamond Firetail	<i>Stagonopleura guttata</i>	V	V	Y	Likely - Subject Land is within the distribution for the species - Potential habitat in the form of open eucalypt woodland - Many records within the locality
Dusky Woodswallow	<i>Artamus cyanopterus cyanopterus</i>	V	-		Likely - Subject Land is within the distribution for the species - Potential habitat in the form of open eucalypt woodland - Many records within the locality
Eastern False Pipistrelle	<i>Falsistrellus tasmaniensis</i>	V	-		Unlikely - Subject Land is within the distribution for the species - Lacks preferred habitat (trees taller than 20 m) - Hollow bearing trees present
Eastern Pygmy-possum	<i>Cercartetus nanus</i>	V	-		Potential - Subject Land is within the distribution for the species - Potential habitat in the form of open eucalypt woodland - No records within the locality
Flame Robin	<i>Petroica phoenicea</i>	V	-		Potential - Subject Land is within the distribution for the species - Potential habitat in the form of open eucalypt woodland - No records within the locality
Glossy Black-Cockatoo	<i>Calyptorhynchus lathami</i>	V	V		Unlikely - Subject Land is within the distribution for the species - Lacks preferred foraging habitat



ERM

Scientific Name	Common Name	BC Act	EPBC Act	PMST	Likelihood of Occurrence
					Subject Land provides hollow bearing eucalypts as suitable nesting habitat
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	V	V		Potential - Subject Land is within the distribution for the species - Potential foraging habitat in the form of open eucalypt woodland - Many records within the locality
Hastings River mouse	<i>Pseudomys oralis</i>	E	E		Unlikely - Subject Land is within the distribution for the species - Potential foraging habitat in the form of open eucalypt woodland - No access to seepage zones, creeks or gullies. - No records within the locality
Hooded Robin (south-eastern form)	<i>Melanodryas cucullata cucullata</i>	E	E		Likely - Subject Land is within the distribution for the species - Potential habitat in the form of open eucalypt woodland, including dead stumps, saplings and grass cover - Recorded within the locality
Koala	<i>Phascolarctos cinereus</i>	E	E	Y	Likely - Subject Land is within the distribution for the species - Potential habitat in the form of open eucalypt woodland, with preferred food trees present - Many records within the locality
Large Bent-winged Bat	<i>Miniopterus orianae oceanensis</i>	V	-		Unlikely - Subject Land is within the distribution for the species - Lacks preferred habitat
Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	E	E	Y	Unlikely - Subject Land is within the distribution for the species - Lacks preferred habitat
Little Eagle	<i>Hieraaetus morphnoides</i>	V	-		Likely - Subject Land is within the distribution for the species - Potential habitat in the form of open eucalypt woodland - Recorded within the locality
Little Lorikeet	<i>Glossopsitta pusilla</i>	V	-		Potential Subject Land is within the distribution for the species



ERM

Scientific Name	Common Name	BC Act	EPBC Act	PMST	Likelihood of Occurrence
					- Potential habitat in the form of open eucalypt woodland - Recorded within the locality
Masked Owl	<i>Tyto novaehollandiae</i>	V	-		Likely - Subject Land is within the distribution for the species - Potential habitat in the form of open eucalypt woodland, with large hollows present - Many records within the locality
Narrow-leaved Black Peppermint	<i>Eucalyptus nicholii</i>	V	V	Y	Likely - Subject Land is within the distribution for the species - Potential habitat in the form of grassy eucalypt woodland - Recorded within the locality
Northern Blue Box	<i>Eucalyptus magnificata</i>	E	-		Unlikely - Subject Land is within the distribution for the species - Not on the correct soil type and not a hilly site
Painted Honeyeater	<i>Grantiella picta</i>	V	V	Y	Potential - Subject Land is within the distribution for the species - Potential habitat in the form of open eucalypt woodland with mistletoe present - Recorded within the locality
Peppered Tree Frog	<i>Litoria piperita</i>	CE	V	Y	Potential - Subject Land is within the distribution for the species - Subject Land is within the geographic limitation for the species (above 800m altitude) - Lacks preferred habitat
Powerful Owl	<i>Ninox strenua</i>	V	-		Potential - Subject Land is within the distribution for the species - Potential habitat in the form of open eucalypt woodland - Recorded within the locality
Regent Honeyeater	<i>Anthochaera phrygia</i>	CE	CE	Y	Potential - Subject Land is within the distribution for the species - Potential habitat in the form of open eucalypt woodland - Records within the locality - Subject Land is not within a mapped important area for Regent Honeyeater



Scientific Name	Common Name	BC Act	EPBC Act	PMST	Likelihood of Occurrence
Scarlet Robin	<i>Petroica boodang</i>	V	-		Likely • Subject Land is within the distribution for the species • Potential habitat in the form of open eucalypt woodland • Many records within the locality
Silky Swainson-pea	<i>Swainsona sericea</i>	V	-		Potential • Subject Land is within the distribution for the species • Found in Box-Gum Woodland in the Southern Tablelands and South West Slopes • Not recorded within the locality.
Southern Myotis	<i>Myotis macropus</i>	V	-		Potential • Subject Land is within the distribution for the species • Potential habitat in the form of open eucalypt woodland • Recorded within the locality
Speckled Warbler	<i>Chthonicola sagittata</i>	V	-		Likely • Subject Land is within the distribution for the species • Potential habitat in the form of open eucalypt woodland • Many records within the locality
Spotted Harrier	<i>Circus assimilis</i>	V	-		Potential • Subject Land is within the distribution for the species • Potential habitat in the form of open eucalypt woodland • Recorded within the locality
Spotted-tailed Quoll	<i>Dasyurus maculatus</i>	V	E	Y	Potential • Subject Land is within the distribution for the species • Potential habitat in the form of open eucalypt woodland • Recorded within the locality
Square-tailed Kite	<i>Lophoictinia isura</i>	V	-		Potential • Subject Land is within the distribution for the species • Potential habitat in the form of open eucalypt woodland • Recorded within the locality
Squirrel Glider	<i>Petaurus norfolcensis</i>	V	-		Potential • Subject Land is within the distribution for the species • Potential habitat in the form of open eucalypt woodland, although lacking a shrub storey and mature tree species • Recorded within the locality



Scientific Name	Common Name	BC Act	EPBC Act	PMST	Likelihood of Occurrence
Swift Parrot	<i>Lathamus discolor</i>	E	CE	Y	Potential - Subject Land is within the distribution for the species - Potential habitat in the form of open eucalypt woodland
Tall Velvet Sea-berry	<i>Haloragis exalata</i> subsp. <i>velutina</i>	V	V	Y	Unlikely - Lacks preferred soil type - Minimal records within locality
Turquoise Parrot	<i>Neophema pulchella</i>	V	-		Potential - Subject Land is within the distribution for the species - Potential habitat in the form of open eucalypt woodland - Recorded within the locality
Tusked Frog population in the Nandewar and New England Tableland Bioregions	<i>Adelotus brevis</i> - endangered population	E	-		Unlikely - Subject Land is within the distribution for the species - Lacks preferred habitat
Varied Sittella	<i>Daphoenositta chrysoptera</i>	V	-		Likely - Subject Land is within the distribution for the species - Potential habitat in the form of open eucalypt woodland with dead branches present - Recorded within the locality
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	V	-		Unlikely - Subject Land is within the distribution for the species - Lacks preferred habitat
White-throated Needle-tail	<i>Hirundapus caudacutus</i>	V	V		Unlikely - Subject Land is within the distribution for the species - Lacks preferred habitat
Yellow-bellied Glider	<i>Petaurus australis</i>	V	V	Y	Potential - Subject Land is within the distribution for the species - Potential foraging habitat in the form of open eucalypt woodland - No records within the locality
Yellow-bellied Sheath-tail-bat	<i>Saccolaimus flaviventris</i>	V	-		Potential - Subject Land is within the distribution for the species - Potential roosting habitat in the form of eucalypt woodland with hollow bearing trees - Recorded within the locality



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Scientific Name	Common Name	BC Act	EPBC Act	PMST	Likelihood of Occurrence
-	<i>Eucalyptus scoparia</i>	E	V		Potential • Subject land is not within the NSW known distribution • There are suitable conditions within the Subject Land • There is only one record in Armidale



APPENDIX E PREDICTED SPECIES REPORT

BAM Predicted Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00057422/BAAS20028/25/00057423	Eathorpe BESS Part 4 SSD	28/10/2024
Assessor Name	Report Created	BAM Data version *
Ashleigh M E McTackett	14/05/2025	Current classification (live - default) (80)
Assessor Number	Assessment Type	BAM Case Status
BAAS20028	Major Projects	Open
Assessment Revision		Date Finalised
0		To be finalised

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

Threatened species reliably predicted to utilise the site. No surveys are required for these species. Ecosystem credits apply to these species.

Common Name	Scientific Name	Vegetation Types(s)
Black Falcon	Falco subniger	3359-New England Hills Stringybark-Box Woodland 3363-Western New England Blakelys Red Gum-Box Grassy Forest
Black-chinned Honeyeater (eastern subspecies)	Melithreptus gularis gularis	3359-New England Hills Stringybark-Box Woodland 3363-Western New England Blakelys Red Gum-Box Grassy Forest
Brown Treecreeper (eastern subspecies)	Climacteris picumnus victoriae	3359-New England Hills Stringybark-Box Woodland 3363-Western New England Blakelys Red Gum-Box Grassy Forest
Diamond Firetail	Stagonopleura guttata	3359-New England Hills Stringybark-Box Woodland 3363-Western New England Blakelys Red Gum-Box Grassy Forest
Dusky Woodswallow	Artamus cyanopterus cyanopterus	3359-New England Hills Stringybark-Box Woodland 3363-Western New England Blakelys Red Gum-Box Grassy Forest
Flame Robin	Petroica phoenicea	3359-New England Hills Stringybark-Box Woodland 3363-Western New England Blakelys Red Gum-Box Grassy Forest

BAM Predicted Species Report

Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	3359-New England Hills Stringybark-Box Woodland 3363-Western New England Blakelys Red Gum-Box Grassy Forest
Large Bent-winged Bat	<i>Miniopterus orianae oceanensis</i>	3359-New England Hills Stringybark-Box Woodland
Little Eagle	<i>Hieraaetus morphnoides</i>	3359-New England Hills Stringybark-Box Woodland 3363-Western New England Blakelys Red Gum-Box Grassy Forest
Little Lorikeet	<i>Glossopsitta pusilla</i>	3359-New England Hills Stringybark-Box Woodland 3363-Western New England Blakelys Red Gum-Box Grassy Forest
Regent Honeyeater	<i>Anthochaera phrygia</i>	3359-New England Hills Stringybark-Box Woodland 3363-Western New England Blakelys Red Gum-Box Grassy Forest
South-eastern Hooded Robin	<i>Melanodryas cucullata cucullata</i>	3363-Western New England Blakelys Red Gum-Box Grassy Forest
Speckled Warbler	<i>Chthonicola sagittata</i>	3359-New England Hills Stringybark-Box Woodland 3363-Western New England Blakelys Red Gum-Box Grassy Forest
Spotted Harrier	<i>Circus assimilis</i>	3359-New England Hills Stringybark-Box Woodland 3363-Western New England Blakelys Red Gum-Box Grassy Forest
Spotted-tailed Quoll	<i>Dasyurus maculatus</i>	3359-New England Hills Stringybark-Box Woodland 3363-Western New England Blakelys Red Gum-Box Grassy Forest
Square-tailed Kite	<i>Lophoictinia isura</i>	3359-New England Hills Stringybark-Box Woodland 3363-Western New England Blakelys Red Gum-Box Grassy Forest
Swift Parrot	<i>Lathamus discolor</i>	3359-New England Hills Stringybark-Box Woodland 3363-Western New England Blakelys Red Gum-Box Grassy Forest
Varied Sittella	<i>Daphoenositta chrysoptera</i>	3359-New England Hills Stringybark-Box Woodland 3363-Western New England Blakelys Red Gum-Box Grassy Forest
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	3359-New England Hills Stringybark-Box Woodland 3363-Western New England Blakelys Red Gum-Box Grassy Forest

BAM Predicted Species Report

White-throated Needletail	Hirundapus caudacutus	3359-New England Hills Stringybark-Box Woodland
		3363-Western New England Blakelys Red Gum-Box Grassy Forest
Yellow-bellied Sheath-tail-bat	Saccolaimus flaviventris	3359-New England Hills Stringybark-Box Woodland
		3363-Western New England Blakelys Red Gum-Box Grassy Forest

Threatened species Manually Added

None added

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Common Name	Scientific Name	Plant Community Type(s)
Black-necked Stork	Ephippiorhynchus asiaticus	3359-New England Hills Stringybark-Box Woodland
		3363-Western New England Blakelys Red Gum-Box Grassy Forest
Painted Honeyeater	Grantiella picta	3363-Western New England Blakelys Red Gum-Box Grassy Forest
South-eastern Glossy Black- Cockatoo	Calyptorhynchus lathami lathami	3359-New England Hills Stringybark-Box Woodland
		3363-Western New England Blakelys Red Gum-Box Grassy Forest

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Refer to BAR for detailed justification

Common Name	Scientific Name	Justification in the BAM-C
Black-necked Stork	Ephippiorhynchus asiaticus	Habitat constraints
Painted Honeyeater	Grantiella picta	Habitat constraints
South-eastern Glossy Black-Cockatoo	Calyptorhynchus lathami lathami	Habitat constraints



APPENDIX F CANDIDATE SPECIES REPORT

BAM Candidate Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00057422/BAAS20028/25/00057423	Eathorpe BESS Part 4 SSD	28/10/2024
Assessor Name	Report Created	BAM Data version *
Ashleigh M E McTackett	14/05/2025	Current classification (live - default) (80)
Assessor Number	Assessment Type	BAM Case Status
BAAS20028	Major Projects	Open
Assessment Revision		Date Finalised
0		To be finalised

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

List of Species Requiring Survey

Name	Presence	Survey Months
<i>Thesium australe</i> Austral Toadflax		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☒ Nov ☒ Dec ☐ Survey month outside the specified months?
<i>Ninox connivens</i> Barking Owl		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Dichanthium setosum</i> Bluegrass		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

BAM Candidate Species Report

<i>Burhinus grallarius</i> Bush Stone-curlew		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Caladenia amnicola</i> Caladenia amnicola		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☒ Nov ☒ Dec ☐ Survey month outside the specified months?
<i>Callistemon pungens</i> Callistemon pungens		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Cercartetus nanus</i> Eastern Pygmy-possum		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Phascolarctos cinereus</i> Koala		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Miniopterus orianae oceanensis</i> Large Bent-winged Bat		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☒ Dec ☐ Survey month outside the specified months?

BAM Candidate Species Report

<i>Chalinolobus dwyeri</i> Large-eared Pied Bat		☒ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☒ Nov ☒ Dec ☐ Survey month outside the specified months?
<i>Hieraaetus morphnoides</i> Little Eagle		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☒ Aug ☒ Sep ☒ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Tyto novaehollandiae</i> Masked Owl		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☒ May ☒ Jun ☐ Jul ☐ Aug ☒ Sep ☒ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Eucalyptus nicholii</i> Narrow-leaved Black Peppermint		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Eucalyptus magnificata</i> Northern Blue Box		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Litoria piperata</i> Peppered Tree Frog		☒ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☒ Oct ☒ Nov ☒ Dec ☐ Survey month outside the specified months?

BAM Candidate Species Report

<i>Swainsona sericea</i> Silky Swainson-pea		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☒ Sep ☒ Oct ☒ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Calyptrorhynchus lathami lathami</i> South-eastern Glossy Black-Cockatoo		☐ Jan ☐ Feb ☐ Mar ☒ Apr ☒ May ☒ Jun ☒ Jul ☒ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Myotis macropus</i> Southern Myotis		☒ Jan ☒ Feb ☒ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☒ Oct ☒ Nov ☒ Dec ☐ Survey month outside the specified months?
<i>Lophoictinia isura</i> Square-tailed Kite		☒ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☒ Sep ☒ Oct ☒ Nov ☒ Dec ☐ Survey month outside the specified months?
<i>Petaurus norfolcensis</i> Squirrel Glider		☒ Jan ☒ Feb ☒ Mar ☒ Apr ☒ May ☒ Jun ☒ Jul ☒ Aug ☒ Sep ☒ Oct ☒ Nov ☒ Dec ☐ Survey month outside the specified months?
<i>Haloragis exalata subsp. velutina</i> Tall Velvet Sea-berry		☒ Jan ☒ Feb ☒ Mar ☒ Apr ☒ May ☒ Jun ☒ Jul ☒ Aug ☒ Sep ☒ Oct ☒ Nov ☒ Dec ☐ Survey month outside the specified months?

BAM Candidate Species Report

<i>Adelotus brevis</i> - endangered population Tusked Frog population in the Nandewar and New England Tableland Bioregions		☐ Jan ☒ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☒ Oct ☒ Nov ☒ Dec ☐ Survey month outside the specified months?
<i>Haliaeetus leucogaster</i> White-bellied Sea-Eagle		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☒ Jul ☒ Aug ☒ Sep ☒ Oct ☒ Nov ☒ Dec ☐ Survey month outside the specified months?

Threatened species Manually Added

None added

Threatened species assessed as not on site

Refer to BAR for detailed justification

Common name	Scientific name	Justification in the BAM-C
Brush-tailed Rock-wallaby	<i>Petrogale penicillata</i>	Habitat constraints
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	Habitat constraints
Powerful Owl	<i>Ninox strenua</i>	Refer to BAR
Regent Honeyeater	<i>Anthochaera phrygia</i>	Habitat constraints
Swift Parrot	<i>Lathamus discolor</i>	Habitat constraints



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