



Biodiversity Development Assessment Report

Bushland Health - Manning Rise
Lot 343 DP1118417
494 Wingham Road, Taree

August 2024
Final (Rev 1)

Prepared For
Bushland Health Group

Project: 19249

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EXECUTIVE SUMMARY

This Biodiversity Development Assessment Report (BDAR) has been prepared by Accuplan to identify the potential impacts on biodiversity values from a proposed seniors' living community located at Lot 343 DP1118417, 494 Wingham Road, Taree. The site has an area of approximately 25.6 hectares and the proposed development would potentially modify or remove vegetation present within the development footprint.

The proposal has been assessed in accordance with the Biodiversity Assessment Method (BAM) 2020.

Native Vegetation Assessment

The vegetation occurring within the proposal area is most consistent with *PCT 3329 - Northern Hinterland Valleys Red Gum Grassy Forest*. Three vegetation zones were recorded within the site:

- **Zone 1: PCT 3329 (Moderate)** – This zone comprises the remnant woodland in the northern part of the site. Despite this zone being severely affected by grazing and weeds, a higher number of native species persisted within the understorey relative to the surrounding pasture (Zones 2 and 3).
- **Zone 2: PCT 3329 (Poor)** – This zone covers highly disturbed areas where clumps of remnant trees occur over grazed pasture. The understorey has a similar composition to the low condition grassland identified in Zone 3; however, some regeneration of nearby trees was recorded which resulted in a higher vegetation integrity score (VIS).
- **Zone 3: Low Condition** – This zone covers the predominantly cleared areas comprised of grazed pasture. Some isolated scattered trees occur throughout this zone; however, tree regeneration within the understorey was generally absent.

Threatened Ecological Communities

No threatened ecological communities occur in the proposal area.

Avoid and minimise impacts

The design of the proposal has implemented the following measures to avoid and minimise impacts to biodiversity:

- The proposal layout is largely sited within existing low condition grassland areas with limited habitat value.
- Remnant vegetation along the northern boundary would be partially retained forming part of the proposed APZ. Large trees (>80 cm DBH) and known food tree species would be preferentially retained within the APZ and the required 15 to 30% canopy coverage would be achieved by removal of trees with lesser habitat value.

- The vegetated riparian zone (VRZ) to be established along the drainage line in the western part of the site forms part of the proposal. The VRZ is highly degraded and revegetation works would be subject to a vegetation management plan (VMP).
- Mitigation measures to minimise impacts to biodiversity are provided in Section 6. These would be embedded in the project consent (if approved) and implemented through a Construction Environmental Management Plan (CEMP) to be developed for the works.

Residual Impacts

The proposal would impact a total of approximately 25 hectares of vegetation including:

- 1.49 hectares of *PCT 3329 - Northern Hinterland Valleys Red Gum Grassy Forest*. This comprises:
 - 1.01 ha to form part of the proposed APZ and involves limited tree removal;
 - 0.48 ha of relatively poor condition vegetation including 16 isolated trees to be directly removed by the proposal.
- 23.5 hectares of low condition grassland. Includes the removal of 28 isolated trees occurring throughout the zone. Approximately 1.8 hectares of low condition grassland would form part of a vegetated riparian zone.

Offsetting under the BC Act

This BDAR identified the following offsetting requirements to address residual impacts of the proposal:

- 17 ecosystem credits to address the impacts to 1.49 hectares of PCT 3329 (in moderate to good condition).
- 11 species credits to address impacts to one candidate threatened species, Southern Myotis.

These credit requirements will be satisfied through retiring of credits under the Biodiversity Offset Scheme, based on like-for-like rules wherever possible. Payments into the Biodiversity Conservation Fund may be made where suitable credits are not currently available.

Assessment of Serious and Irreversible Impacts (SAIL)

The proposal is unlikely to impact any threatened ecological community or species at risk of SAIL.

SEPP (Biodiversity and Conservation) 2021 - Koala Habitat Protection 2021

The proposed development involves clearing of native vegetation within potential Koala habitat and a Koala Assessment Report addressing Chapter 4 of State Environmental Planning Policy (Biodiversity and Conservation) 2021 is provided in **Appendix VII**.

Matters of National Environmental Significance (EPBC Act)

The MNES assessment concluded that the proposed impacts to vegetation and habitat is unlikely to have a significant impact on any TEC or threatened species listed under the EPBC Act. As such, it is considered that a referral under the EPBC Act is not likely to be required for the project.

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Report History

Date	Revision	Comment
November 2023	Rev A (Draft)	For review
27 June 2024	Rev 0 (Final)	
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Definitions	
Accredited person or assessor	Means as person accredited under section 6.10 (of the BC Act) to prepare reports in accordance with the BAM.
Biodiversity Assessment Method	The Biodiversity Assessment Method is established under section 6.7 of the BC Act. The BAM is established for the purpose of assessing certain impacts on threatened species and threatened ecological communities (TECs), and their habitats, and the impact on biodiversity values.
Biodiversity offsets	The gain in biodiversity values achieved from the implementation of management actions on areas of land, to compensate for losses to biodiversity values from the impacts of development (DPIE 2020a).
Biodiversity Assessment Method Calculator	Biodiversity Assessment Method Calculator (BAM-C) – the online computer program that provides decision support to assessors and proponents by applying the BAM and referred to as the BAM-C. The BAM-C contains biodiversity data from the BioNet Vegetation Classification and the Threatened Biodiversity Data Collection that the assessor is required to use in a BAM assessment. The BAM-C applies the equations used in the BAM, including those to determine the number and class of biodiversity credits required to offset the impacts of a development, or created at a biodiversity stewardship site. It is published by the Department (DPIE 2020a).
Biodiversity credit report	The report produced by the BAM-C that sets out the number and class of biodiversity credits required to offset the remaining adverse impacts on biodiversity values at a development site, or on land to be biodiversity certified, or that sets out the number and class of biodiversity credits that are created at a biodiversity stewardship site (DPIE 2020a).
Biodiversity Offsets and Agreement Management System	The online system used to administer the Biodiversity Offsets Scheme. The BOAMS is used by accredited assessors (to carry out specific BAM-related tasks involving access to the BAM-C to perform assessments, submit data, generate credits and calculate a credit price), by landholders (to apply for a Biodiversity Stewardship Agreement and manage ongoing reporting obligations for their agreement) and by proponents of developments (to view their credit obligation or the payment required to the Biodiversity Conservation Fund).
Biodiversity Stewardship site	Refers to land which is the subject to a Biodiversity Stewardship Agreement under the BC Act.
BioNet Atlas	The DPIE database of flora and fauna records (formerly known as the NSW Wildlife Atlas). The Atlas contains records of plants, mammals, birds, reptiles, amphibians, some fungi, some invertebrates (such as insects and snails listed under the BC Act) and some fish (DPIE 2020a).
BioNet Vegetation classification	Refers to the vegetation community-level classification for use in vegetation mapping programs and regulatory biodiversity impact assessment frameworks in NSW. The BioNet Vegetation Classification is published by the Department and available at www.environment.nsw.gov.au/research/Visclassification.htm (DPIE 2020a).
Construction footprint	The area to be directly impacted by the proposal during construction activities. See also definition for subject land.

Definitions	
Cumulative impact	The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.
Direct impact	Direct impacts on biodiversity values include those related to clearing native vegetation and threatened species habitat, and impacts on biodiversity values prescribed by the Biodiversity Conservation Regulation 2017 (the BC Regulation) (DPIE 2020a).
Ecosystem credit species	Threatened species or components of species habitat that are identified in the Threatened Species Data Collection as requiring assessment for ecosystem credits. This is analogous with the definition of 'predicted species'.
Ecosystem credits	A measurement of the value of threatened ecological communities, threatened species habitat for species that can be reliably predicted to occur with a PCT, and PCTs generally. Ecosystem credits measure the loss in biodiversity values at a development, activity, clearing or biodiversity certification site and the gain in biodiversity values at a biodiversity stewardship site (DPIE 2020a).
Habitat	An area or areas occupied, or periodically or occasionally occupied, by a species, population or ecological community, including any biotic or abiotic component (DPIE 2020a).
Indirect impact	Impacts that occur when the proposal affects native vegetation and threatened species habitat beyond the development footprint or within retained areas (e.g. transporting weeds or pathogens, dumping rubbish). This includes impacts from activities related to the construction or operational phase of the proposal and prescribed impacts (DPIE 2020a).
Local population	The population that occurs in the study area. The assessment of the local population may be extended to include individuals beyond the study area if it can be clearly demonstrated that contiguous or interconnecting parts of the population continue beyond the study area, according to the following definitions: • The local population of a threatened plant species comprises those individuals occurring in the study area or the cluster of individuals that extend into habitat adjoining and contiguous with the study area that could reasonably be expected to be cross-pollinating with those in the study area. • The local population of resident fauna species comprises those individuals known or likely to occur in the study area, as well as any individuals occurring in adjoining areas (contiguous or otherwise) that are known or likely to utilise habitats in the study area. • The local population of migratory or nomadic fauna species comprises those individuals that are likely to occur in the study area from time to time or return year to year (OEI 2018).
Matter of national environmental significance	A matter of national environmental significance (MNES) is any of the nine defined components protected by a provision of Part 3 of the EPBC Act (Commonwealth).

Definitions	
NSW (Mitchell) landscape	Landscapes with relatively homogeneous geomorphology, soils and broad vegetation types, mapped at a scale of 1:250,000 (DPIE 2020a).
Mitigation	Action to reduce the severity of an impact.
Native vegetation	Has the same meaning as in section 1.6 of the BC Act and section 60B of the LLS Act. In summary, (a) trees (including any sapling or shrub or any scrub), (b) understorey plants, (c) groundcover (being any type of herbaceous vegetation), (d) plants occurring in a wetland. A plant is native to New South Wales if it was established in New South Wales before European settlement (BC Act). Native vegetation does not extend to marine vegetation (being mangroves, seagrasses or any other species of plant that at any time in its life cycle must inhabit water other than fresh water). Marine vegetation is covered by the provisions of the FM Act.
Operational footprint	The area that will be subject to ongoing operational impacts from the proposal. This includes the road, surrounding safety verges and infrastructure, fauna connectivity structures and maintenance access tracks and compounds.
Patch size	An area of native vegetation that: • occurs on the development site or biodiversity stewardship site • includes native vegetation that has a gap of less than 100 m from the next area of native vegetation (or ≤ 30 m for non-woody ecosystems). Patch size may extend onto adjoining land that is not part of the development site or biodiversity stewardship site (DPIE 2020a).
PlantNET	An online database of the flora of New South Wales which contains currently accepted taxonomy for plants found in the State, both native and exotic.
Population	A group of organisms, all of the same species, occupying a particular area (DPIE 2020a).
Species credit species	Threatened species or components of species habitat that are identified in the Threatened Species Data Collection as requiring assessment for species credits (DPIE 2020a). This is analogous with the definition of 'candidate species'.
Species credits	The class of biodiversity credits created or required for the impact on threatened species that cannot be reliably predicted to use an area of land based on habitat surrogates. Species that require species credits are listed in the Threatened Biodiversity Data Collection (DPIE 2020a).
Species polygon	An area of land identified in Chapter 5 (of the BAM) that contains habitat or is occupied by a threatened species (DPIE 2020a).

Definitions

Subject land	Land subject to a development, activity, clearing, biodiversity certification or a biodiversity stewardship proposal. It excludes the landscape assessment area which surrounds the subject land (ie the area of land in the 1500 m buffer zone around the subject land or 500m buffer zone for linear proposals). In the case of a biodiversity certification proposal, subject land includes the biodiversity certification assessment area (DPIE 2020a). See also definition for construction footprint.
Study area	The area directly affected by the proposal (subject land or construction footprint) and any additional areas likely to be affected by the proposal, either directly or indirectly.
Threatened Biodiversity Data Collection	A publicly assessable online database (registration required) which contains information for listed threatened species, populations and ecological communities (DPIE 2020a). Part of the BioNet database, published by EESG and accessible from the BioNet website at www.bionet.nsw.gov.au .
Vegetation integrity (score)	The condition of native vegetation assessed for each vegetation zone against the benchmark for the PCT. The vegetation integrity score is the quantitative measure of vegetation condition calculated by the BAM-C (DPIE 2020a).
Vegetation zone	A relatively homogeneous area of native vegetation on a development site, clearing site, land to be biodiversity certified or biodiversity stewardship site that is the same PCT and has the same broad condition state (DPIE 2020a).

Abbreviations

AOBV	Area of Outstanding Biodiversity Value
BAM	Biodiversity Assessment Method
BAM-C	Biodiversity Assessment Method Credit Calculator
BC Act	Biodiversity Conservation Act 2016 (NSW)
BC Regulation	Biodiversity Conservation Regulation 2017 (NSW)
BOS	Biodiversity Offsets Scheme
BDAR	Biodiversity Development Assessment Report
BOAMS	Biodiversity Offsets and Agreement Management System
CEEC	Critically Endangered Ecological Community
CEMP	Construction Environmental Management Plan
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DPE	NSW Department of Planning and Environment
EEC	Endangered Ecological Community
EIS	Environmental Impact Statement
EOO	Extent of occupancy
EP&A Act	Environmental Planning and Assessment Act 1979
EPBC Act	Environmental Protection and Biodiversity Conservation Act 1999 (Federal).
FM Act	Fisheries Management Act 1994 (NSW)
GDE	Groundwater dependent ecosystems
IBRA	Interim Biogeographically Regionalisation of Australia
MNES	Matters of National Environmental Significance
PCT	Plant Community Type
PMST	Protected Matters Search Tool
SAII	Serious and Irreversible Impact
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
TECs	Threatened Ecological Communities
TBDC	Threatened Biodiversity Data Collection
VEC	Vulnerable Ecological Community
VIS	Vegetation Information System

Declarations

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

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

Signature:



Date: 27 June 2024

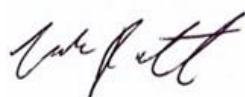
Luke Pickett

*Bachelor of Environmental Science
Master of Wildlife (Habitat) Management
Accredited Biodiversity Assessor (BAAS17100)*

ii. Conflict of Interest

I declare that I have considered the circumstances and there is no actual, perceived or potential conflict of interest. This declaration has been made in the interests of full disclosure to the decision-maker and the client.

Signature:



Date: 27 June 2024

Luke Pickett

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Master of Wildlife (Habitat) Management
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1. INTRODUCTION

Accuplan has been commissioned by Bushland Health Group to prepare a Biodiversity Development Assessment Report (BDAR) in relation to a proposed seniors living development at 494 Wingham Road, Taree. This BDAR has been completed in accordance with the Biodiversity Assessment Methodology (BAM) and has been prepared to accompany a development application to Mid-Coast Council.

1.1 Site Description

The subject site is in the Mid-Coast Local Government Area and comprises residential zoned land known as Lot 343 DP1118417, 494 Wingham Road, Taree. The site has an area of approximately 25.6 hectares and the current land use is largely rural grazing land. The north-eastern corner of the site contains a vacant dwelling and associated sheds and gardens with an isolated farm shed also located in the south of the site. The remainder of the site comprised of pasture with isolated trees and some remnant woodland along the northern boundary.

Two first order streams are mapped within the site, both of which are headwater streams of Munghi Creek and form part of the Manning River catchment. The stream mapped in the eastern part of the proposal area is a grassed dry depression with no permanent aquatic flora. The stream in the western part of the proposal area has defined channels with intermittent flow and with three dams located along its length.

A location map of the proposal area is provided in **Figure 1.1**.

1.2 Proposal Description

The proposal is for a seniors living community which would be developed over eight (8) stages. The proposal includes the following components:

- A village comprised of 209 independent living units (ILUs), arranged in 8 precincts;
- Community facilities;
- RV and caravan parking;
- Communal landscaped areas and bushland reserve which includes a bushfire asset protection zone (APZ) in the northern part of the site.

A plan of proposal is provided in **Figure 1.2**.

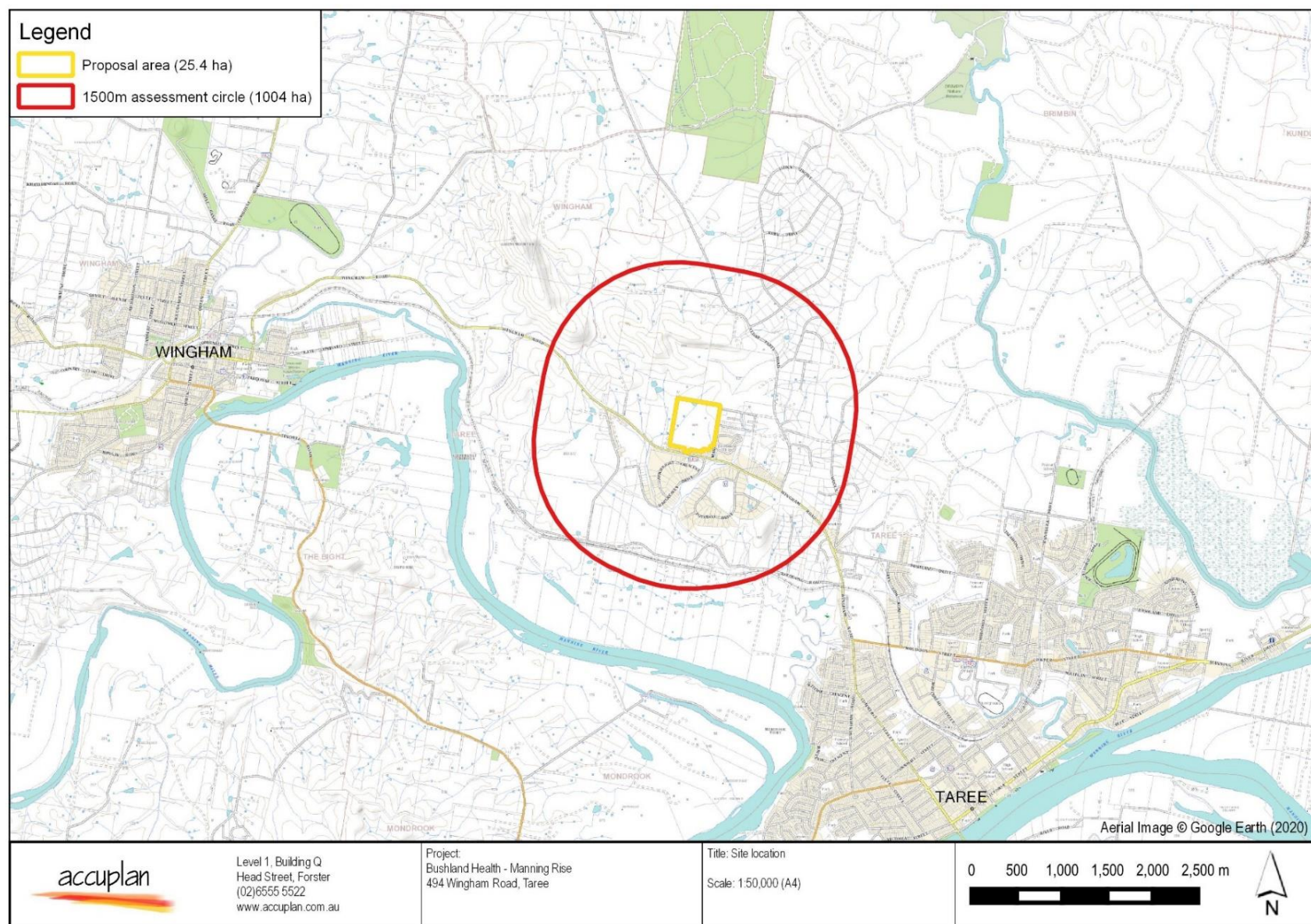


Figure 1.1: Location Map



1.3 Study Aims

This study aims to assess the potential impacts of the proposed works on the biodiversity values of the local area. Specifically, it aims to:

- Describe the existing environment;
- Recommend measures to avoid and minimise any potential impacts to protected biodiversity values;
- Calculate any required offset obligation in accordance with the BAM.

1.4 Biodiversity Assessment Requirements

1.4.1 Application of the BAM

The *Biodiversity Conservation Act 2016*, together with the *Biodiversity Conservation Regulation 2017*, outlines the framework for addressing impacts on biodiversity from development and clearing. It establishes a framework to avoid, minimise and offset impacts on biodiversity from development through the Biodiversity Offsets Scheme (BOS). Thresholds for entry into the scheme are:

1. whether the impacts occur on an area mapped on the Biodiversity Values map published by the Minister for the Environment; or
2. whether the amount of native vegetation being cleared exceeds a threshold area (see below); or
3. whether the proposal would have a significant impact on threatened communities or species – determined by the “5-part test”.

Review of the Biodiversity Values map indicates that the site was not mapped at the time of preparing this advice. The BOS would not be triggered in relation to point (1) above.

The minimum lot size for the land is 450m² and the associated threshold for entry into the BOS is 0.25 hectares. The proposal exceeds this threshold and a BDAR is required in accordance with Section 7.4 of the BC Act.

1.4.2 Commonwealth Legislation

Under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act), a referral is required to the Australian Government for proposed actions that have the potential to significantly impact on Matters of National Environmental Significance or the Environment of Commonwealth land. This includes impacts to threatened species, communities and migratory species listed under the EPBC Act. These are considered in **Section 5.7.1**.

The assessment of the proposal's impact on Matters of National Environmental Significance and the Environment of Commonwealth land found that there is unlikely to be a significant impact on relevant matters of national environmental significance or on Commonwealth land. Accordingly, the proposal has not been referred to the Australian Government Department of the Environment under the EPBC Act.

1.5 Personnel

This BDAR was prepared by accredited assessor Luke Pickett (BAAS17100). All content and fieldwork has been conducted in accordance with the Biodiversity Assessment Method (BAM).

1.6 Information Sources

The following information sources were used for this assessment:

- Office of Environment and Heritage (OEH) licensed Bionet Atlas of NSW Wildlife database (local records within 10km of proposal area - last accessed 15 September 2023)
- Department of Climate Change, Energy, the Environment and Water (DCCEEW) Protected Matters Search Tool (local records within 10km of proposal area - last accessed 15 September 2023)
- Biodiversity Assessment Method Calculator (Version: 1.4.0.0) (BAM-C). BAM data last updated 14/03/2024 (Version 67)
- *Biodiversity Assessment Method* (OEH, 2020)
- NSW Biodiversity Values Map – last accessed October 2023
- *NSW Vegetation Information System* (VIS) classification database (OEH, 2023)
- NSW State Vegetation Type Map (Release C1.1.M1 - September 2022)
- Flora And Fauna Assessment of Lot 23 DP610112, Lot 27 DP 561220, Lot 26 DP 619155 and Lot 19 DP 584247, Wingham Road And Marie Avenue, Taree (Conacher Travers, 2004)

2. LANDSCAPE ASSESSMENT

A landscape assessment in accordance with Section 4 of the BAM (DPIE, 2020) was undertaken for input into the BAM Calculator. The landscape value considers several factors including:

- IBRA bioregions and subregions
- Rivers, streams and estuaries
- Native vegetation cover and patch size
- Wetlands
- Habitat connectivity
- Areas of geological significance and soil hazard features
- Areas of outstanding biodiversity value

A summary of the local landscape context is provided **Table 2.1**.

Table 2.1: Local landscape context summary

Attribute	Description
LGA	Mid-Coast Council
Zoning	R1 – General Residential (<i>Greater Taree Local Environmental Plan 2010</i>)
Catchment	Manning River
IBRA Bioregion	NSW North Coast
IBRA Subregion	Karuah Manning (covers the entire 1500m assessment circle)
Mitchell Landscape	Port Macquarie Coastal Ramp (Pmr)
Native Vegetation Cover	A 1500m buffer was applied to the proposal area resulting in an overall buffer area of 1004 ha. The extent of native vegetation cover was determined via aerial photography interpretation (LPI Imagery - 2013 and Google Earth - 2019). A total of 332 ha (33%) of the buffer area was determined to support native woody vegetation with benchmark cover. An additional 2% coverage was added to the total (i.e., 35%) to account for isolated and sporadic vegetation present within the assessment circle. The resultant vegetation cover falls into the >30 – 70% category within the BAM Calculator.
Patch Size	A patch is defined in Section 4.3.2 of the BAM as an area of native vegetation that occurs on the subject land and includes native vegetation that has a gap of less than 100 metres from the next area of native vegetation (or ≤ 30 metres for non-woody ecosystems). The patch may extend onto adjoining land. Woody vegetation present in the north of the site is contiguous with extensive areas of forest occurring to the north of the site and has been allocated to the >100 hectares patch size class.
Connectivity Features	Limited to intact vegetation occurring along the eastern part of the northern boundary. The remainder of the proposal site is isolated by rural, residential and industrial land.
Rivers and Streams	Two first order streams are mapped within the site (Figure 2.1). The stream mapped in the east of the proposal area is a grassed dry gully with no permanent aquatic flora. The stream in the west of the proposal area has defined channels with intermittent flow and a number of dams along its length. Both drainage lines are largely cleared of native vegetation.
Wetlands	No wetlands occur within the vicinity of the proposal area.

Attribute	Description
Areas of Geological Significance and Soil Hazard Features	There are no areas of geological significance (karst, caves, crevices, cliffs or other features) within the subject site. Three soil landscapes have been mapped within the proposal area (Figure 2.1) (OEH, 2018b). The soil landscapes and associated hazards are described below. Kew (kwz) Landscape — Undulating rises on Devonian and Carboniferous sediments in the far north-east of the Hunter Region. Slopes 3 - 10%, local relief 10 – 20 m, elevation 5 – 30 m. Extensively cleared open forests. Qualities and limitations — Localised shallow soils, widespread foundation hazard, localised recharge zone, localised discharge zone, widespread sheet erosion hazard, widespread poor drainage, widespread seasonal waterlogging. Yarrat (yal) Landscape — Undulating rises on undifferentiated Permian sediments in Kempsey-Myall Low Hills in the north-east of the Hunter Region. Slopes 3 - 10%, local relief 5 - 30 m, elevation 5 - 60 m. Qualities and limitations — Localised shallow soils, localised poor moisture availability, widespread foundation hazard, localised discharge zone, localised gully erosion hazard, widespread sheet erosion hazard, localised high run-on, widespread poor drainage, widespread seasonal waterlogging. Shinglers Creek (shp) Landscape — Level plains to undulating plains and fans on eroded Quaternary sediments in the Kempsey-Myall Coastal Low Hills in the north-east of the Hunter Region. Slopes 0 - 5%, local relief 2 - 10 m, elevation 10 - 280 m. Partially cleared tall open-forest. Qualities and limitations — Widespread foundation hazard, widespread discharge zone, widespread gully erosion hazard, widespread sheet erosion hazard, localised streambank erosion hazard, widespread high run-on, widespread poor drainage, localised permanently high watertables, widespread seasonal waterlogging, localised flood hazard.
Areas of Outstanding Biodiversity Value	No areas of outstanding biodiversity value occur within the vicinity of the proposal site.
Nearest OEH park	Brimbin Nature Reserve is located about 4 km to the north-east of the proposal area.

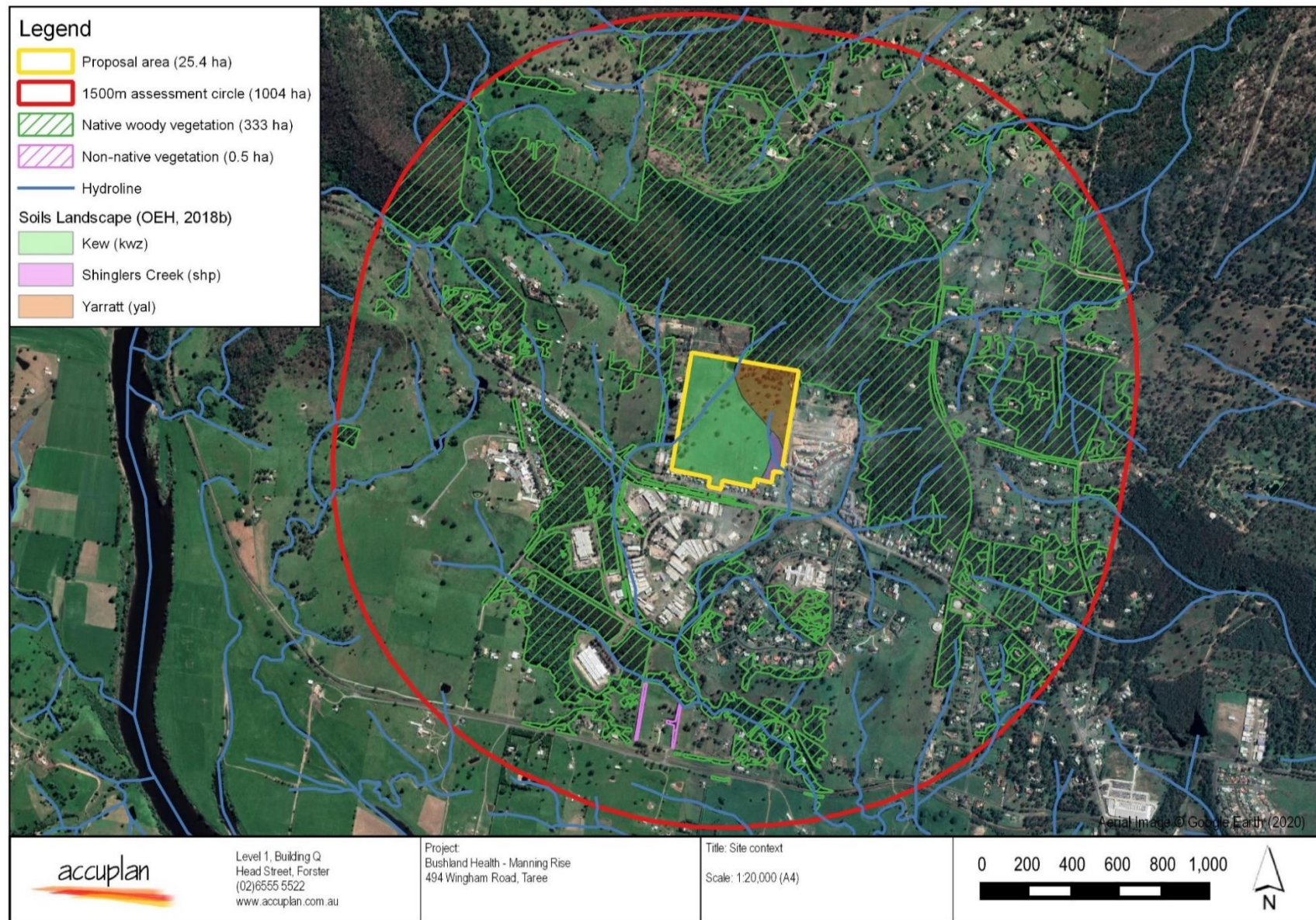


Figure 2.1: Site context

3. NATIVE VEGETATION

3.1 Native Vegetation Extent

Native vegetation occurring within the proposal area is comprised of a 0.5-hectare patch of remnant *Corymbia maculata* (Spotted Gum) / *Eucalyptus tereticornis* (Forest Red Gum) woodland located near the northern boundary and scattered trees located throughout the proposal area. The remainder of the proposal area is pasture, largely comprised of exotic species.

3.2 Methods to Assess PCTs

3.2.1 Transitional Arrangements for Revised Plant Community Types

The BAM-Calculator (BAM-C) was updated on 14 April 2023 to include the revised Plant Community Type (PCT) classification for the NSW coastal and tablelands bioregions. Transitional arrangements are in place that allow eligible Part 4 proposals (EP&A Act) to use the previous PCT classifications in BAM-C for up to 12 months until 14 April 2024. This project is eligible to apply the transitional arrangements as the BAM-C case was in progress prior to the 14 April 2023 cut-off date.

The transitional arrangements were established in the BAM-C to allow assessors with in-progress BAM-C assessments in the coastal and tablelands IBRA bioregions to maintain access to the previous version of the BAM-Calculator data and avoid changes to assessments. The transitional arrangements also allow assessors to opt in and apply the revised PCTs and new data to their assessment if preferred. For this assessment, the revised PCTs have been applied as the vegetation occurring within the site did not have any close matches to the previously described PCTs.

3.2.2 Review of Existing Information

A review of existing information was undertaken for the site. This included review of the following databases and literature relevant to the site and local area:

- NSW Vegetation Information System (VIS) classification database (OEH, 2020).
- *Greater Hunter Native Vegetation Mapping v4* VIS ID 3855 (Sivertsen *et al.*, 2011).
- *Hunter, Central and Lower North Coast Vegetation Classification and Mapping Project - Vegetation Community Profiles* (Somerville, 2009).
- *Greater Taree LGA Vegetation Mapping* VIS ID 3911 (McDonald, 2006)
- *Vegetation Map for the Mid North Coast of NSW* VIS ID 3886 (Ecological Australia 2006)
- *NSW State Vegetation Type Map* (Release C1.1.M1 - September 2022)

Local vegetation mapping identifies most of the proposal area as cleared land or non-native vegetation. Previously mapped native vegetation within the site is summarised in Table 3.1:

Table 3.1: Vegetation previously mapped within the proposal area

Source	Description
Greater Hunter Native Vegetation Map (VIS ID 3855)	Map Unit 30 - Tallowood - Small-fruited Grey Gum - Kangaroo Grass grassy tall open forest on foothills of the lower North Coast. This community is associated with PCT 1548 of the same name. Mapped native vegetation limited to a small patch of forest in the north of the site.
Greater Taree LGA Vegetation Map (VIS ID 3911)	Type 4 - Spotted Gum. Mapped native vegetation limited to a small patch of forest in the north of the site.
Vegetation Map for the Mid North Coast of NSW (VIS ID 3886)	Mapping identifies two PCTs within the site: - Map Unit 340 Southern Dry Foothills Spotted Gum – Mapped along the northern boundary of the site. - Map Unit 600 Wattle / Native Pioneers – Mapped in the north-eastern corner of the site.
NSW State Vegetation Type Map (Release C1.1.M1 - September 2022)	Mapping identifies three PCTs within the site: - PCT 3244 Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest – Restricted to a patch in the north-eastern corner of the site. - PCT 3329 Northern Hinterland Valleys Red Gum Grassy Forest – Small isolated patches of trees occurring within the site. - PCT 4042 Lower North Riverflat Eucalypt- Paperbark Forest – Small isolated patches mapped along the drainage line in the west of the site.

3.2.3 Floristic survey

Field surveys were undertaken throughout April and May 2020 by Luke Pickett (Accreditor Assessor No: BAAS17100) and Shannon Baker.

A number of sampling techniques were used to ensure the site was adequately sampled. The site was scoped using the 'Random Meander Technique' described by Cropper (1993). This involved walking in a random meander throughout the proposal site, visiting the full range of habitats and recording every plant species observed.

Vegetation plots are randomly positioned within vegetation zones using the random points function in QGIS. The bearing of the plot is dependent on the size and topography of the vegetation zone but is typically selected to best represent the vegetation zone and avoid zone edges and ecotones. Vegetation plots are established in accordance with the Biodiversity Assessment Method as detailed in **Section 3.2.4.**

Plant community types (PCTs) were determined by comparing the floristic structure and composition of the vegetation on site with vegetation profiles described within the VIS database (OEH, 2020) and community descriptions of endangered ecological communities known to occur in the local area.

A list of all plant species recorded during fieldwork is listed in **Appendix I**.

3.2.4 Vegetation Plots

Seven vegetation plots were completed to assess the vegetation integrity of native vegetation within the proposal area. Data collected within the plot/transect includes:

- Flora diversity and composition;
- Groundcover composition and abundance;
- Vegetation structure (including canopy, sub-canopy, shrub and groundcovers);
- Fauna habitats (including hollow trees, fallen timber);
- Regeneration of canopy species;
- Landscape features (including slope, gully and aspect);
- Soil features (including soil type, rocks, organic matter); and
- Geographical coordinates and a photographic record.

A summary of the plots undertaken is provided in Table 3.2.

Table 3.2: BAM Vegetation Plot Summary

PCT/ Zone	Patch size class (ha)	Area of impact (ha)	Minimum plots required	Quadrats completed
Zone 1: PCT 3329 – Moderate Condition	>100	0.48	1	1
Zone 2: - PCT 3329 - Poor Condition	>100	1.01	1	2
Zone 3: Low Condition	<5	23.5	4	4
TOTAL		24.99	6	7

3.3 Plant community types (PCTs)

The canopy of the remnant vegetation is primarily composed of *Corymbia maculata* (Spotted Gum) and *Eucalyptus tereticornis* (Forest Red Gum). Other trees recorded on site typically occur as paddock trees and include *E. siderophloia* (Grey Ironbark), *E. moluccana* (Grey Box), *E. microcorys* (Tallowwood) and *C. intermedia* (Pink Bloodwood). Shrubs are generally absent, and the groundcover is composed of grazed pasture with a high proportion of exotics.

The Plot to PCT assignment tool was used to give an indication of potential relationships to described PCTs. Plot data for entry into the tool was limited to Plot 1 only as vegetation within the other plots was highly modified and did not return any statistically significant matches. The data from Plot 1 returned relatively strong matches for two possible PCTs (3329 and 3446). *PCT 3329 - Northern Hinterland Valleys Red Gum Grassy Forest* has been selected as the 'best fit' option and justification for the selection of this PCT is discussed below in **Table 3.3**.

The distribution of vegetation occurring in the proposal area is shown in **Figure 3.1** and a description is provided in **Table 3.3**. A full list of species recorded during the field survey is provided in **Appendix I**.

Table 3.3: Description of PCT 3329 recorded in the proposal area

PCT ID	PCT 3329 - Northern Hinterland Valleys Red Gum Grassy Forest
% Cleared Estimate	79% (VIS Database, 2023)
BC Act Status	Not associated with any listed EEC
EPBC Act Status	Not associated with any listed EEC
Vegetation Formation	Grassy Woodlands
Vegetation Class	Coastal Valley Grassy Woodlands
PCT Description	A tall to extremely tall sclerophyll open forest with a sparse mid-stratum of soft-leaved shrubs and small trees and a distinct, grassy ground layer that occurs on undulating hills in the hinterland valleys of the Manning, Hastings, Macleay and Clarence River valleys. The canopy almost always includes red gums (<i>Eucalyptus tereticornis</i> or <i>Eucalyptus amplifolia</i>). Other canopy species that are occasionally present in localised areas include <i>Eucalyptus eugenioides</i>, <i>Eucalyptus moluccana</i> and apples (<i>Angophora subvelutina</i> or <i>A. floribunda</i>). The mid-stratum very frequently includes scattered acacias of which <i>Acacia implexa</i> and <i>Acacia melanoxylon</i> are most frequent, occasionally accompanied by <i>Breynia oblongifolia</i> or <i>Notelaea longifolia</i>. This PCT primarily occurs on fine-grained sediments; however, is also known from acid volcanics or granite. The hinterland valleys where it occurs have been extensively cleared and it often occurs in small patches, around the margin of the valley floor or on lower slopes of the adjoining hills. It typically occurs at elevations of below 350 metres asl in hot, moist environments.
Occurrence within Proposal Area	Relatively intact areas are restricted to a small patch of remnant vegetation present in the north of the site. Small isolated patches and remnant trees occurring throughout the site have also been attributed to this PCT.
PCT Justification	PCT 3329 was selected as the best fit option given: - The presence of diagnostic canopy species <i>C. maculata</i>, <i>E. siderophloia</i> and <i>E. tereticornis</i> which were the most common species within the site and occasional presence of other diagnostic canopy species including <i>E. moluccana</i>, <i>C. intermedia</i>, <i>Angophora subvelutina</i> and <i>E. microcorys</i>. - The site lies within the typical spatial distribution for this community with reference sites for PCT 3329 extending from Stroud Road to the south, Brimbin to the east, Curricabark to the west and Tabulam to the north. - The Plot to PCT tool returned a relatively strong match for this PCT and the site is within the calculated typical environmental variable range for the PCT. - The vegetation on site, whilst disturbed, is consistent with a grassy woodland formation. The following PCTs were also considered: - PCT 3446 Lower North Foothills Ironbark-Box-Gum Grassy Forest. This PCT was the only other community to return a similarly strong Plot to PCT tool match. Whilst floristically similar, this PCT was excluded as the site lies outside the typical spatial distribution of this PCT. All reference sites occur to the south of the proposal area with the nearest occurring at Stratford to the south-west of the site and most reference sites located within the Hunter Valley. - PCT 3244 Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest. The NSW SVTM identifies this community near the northern boundary of the site. The Plot to PCT did not return any matches to this PCT which may be attributable to the disturbed nature of the understorey and relatively low tree diversity. The prevalence of Spotted Gum in the north of the site may suggest some intergrading with this PCT which is likely to extend further upslope to the north of the site.

	PCT 4042 Lower North Riverflat Eucalypt-Paperbark Forest. The NSW SVTM identifies small patches of this community near the drainage line in the western part of the site. The remnant patches lack a sub-canopy of <i>Melaleuca</i> spp. typical of this PCT and, given the highly disturbed nature of the understorey, identifiable features are limited to remnant trees which are consistent with PCT 3329. PCT 4042 typically occurs on creek flats, river flats and elevated residual alluvial terraces and is associated with the TEC Subtropical Coastal Floodplain Forest. The patches are not consistent with any TEC vegetation as the highly disturbed patches mostly occur on sloping ground on either side of the drainage line and are not located on flood prone land.
Canopy: to 20m, 35–50% cover	<i>Corymbia maculata</i> (Spotted Gum), <i>Eucalyptus tereticornis</i> (Forest Red Gum), <i>Eucalyptus siderophloia</i> (Grey Ironbark)
Shrubs: to 0.5m, <1% cover	<i>Acacia implexa</i> (Hickory Wattle), <i>Notelaea longifolia</i> (Mock Olive), <i>Breynia oblongifolia</i> (Breynia)
Native Goundcover to 1m, 20-40% cover	<i>Bothriochloa macra</i> (Red-leg Grass), <i>Cymbopogon refractus</i> (Barbed Wire Grass), <i>Aristida vagans</i> (Three-awn Speargrass), <i>Microlaena stipoides</i> (Weeping Meadow Grass), <i>Commelina cyanea</i> (Scurvy Weed), <i>Murdannia graminea</i> (Grass Lily)
Climbers	<i>Cayratia clematidea</i> (Native Grape), <i>Clematis aristata</i> (Old Man's Beard)
Exotics >50% cover	<i>Bidens pilosa</i> (Cobblers Pegs), <i>Asparagus aethiopicus</i> (Ground Asparagus), <i>Lantana camara</i> (Lantana), <i>Axonopus fissifolius</i> (Narrow-leafed Carpet Grass), <i>Sida rhombifolia</i> (Paddy's Lucerne), <i>Plantago lanceolata</i> (Lamb's Tongues), <i>Setaria sphacelata</i> (South African Pigeon Grass), <i>Digitaria sanguinalis</i> (Summer Grass), <i>Eleusine indica</i> (Crowsfoot Grass)
Condition	Remnant patches occurring within the site have a highly modified understorey due to a long history of grazing. The vegetation zones identified within the proposal area are described in Section 4.1.3 .



Figure 3.1: Vegetation map showing vegetation zones, scattered trees and vegetation plots

3.3.1 Vegetation Integrity Scores (Current)

Three vegetation zones were identified within the proposal area:

- **Zone 1: PCT 3329 (Moderate)** – This zone comprises the remnant woodland in the northern part of the site. The limits of this zone were determined by the presence of an intact canopy (relative to benchmark coverage). Despite this zone being severely affected by grazing and weeds, a higher number of native species persisted within the understorey relative to the surrounding pasture (Zones 2 and 3).
- **Zone 2: PCT 3329 (Poor)** – This zone covers highly disturbed areas where clumps of remnant trees occur over grazed pasture. The understorey has a similar composition to the low condition grassland identified in Zone 3; however, some regeneration of nearby trees was recorded which resulted in a higher vegetation integrity score (VIS).
- **Zone 3: Low Condition** – This zone covers the predominantly cleared areas comprised of grazed pasture. Some isolated scattered trees occur throughout this zone; however, tree regeneration within the understorey was generally absent. This vegetation zone is low condition as the overall VIS is well below 20.

The vegetation integrity scores for each identified vegetation zone are provided in Table 3.4 below.

Table 3.4: Summary of Vegetation Integrity Scores (VIS)

Vegetation Zone	Composition Score	Structure Score	Function Score	Vegetation Integrity Score
Zone 1: PCT 3329 (Moderate)	79.8	45.2	70.4	63.3
Zone 2: PCT 3329 (Poor)	27.3	14.2	25.1	21.4
Zone 3: Low Condition ^(Note 1)	7.5	16.3	2	6.3

Note 1: Zone 3 is not consistent with any described PCT. Condition was assessed against benchmark values for PCT 3329.



Photo 1: Zone 1 PCT 3329 (Moderate) – Plot 1.

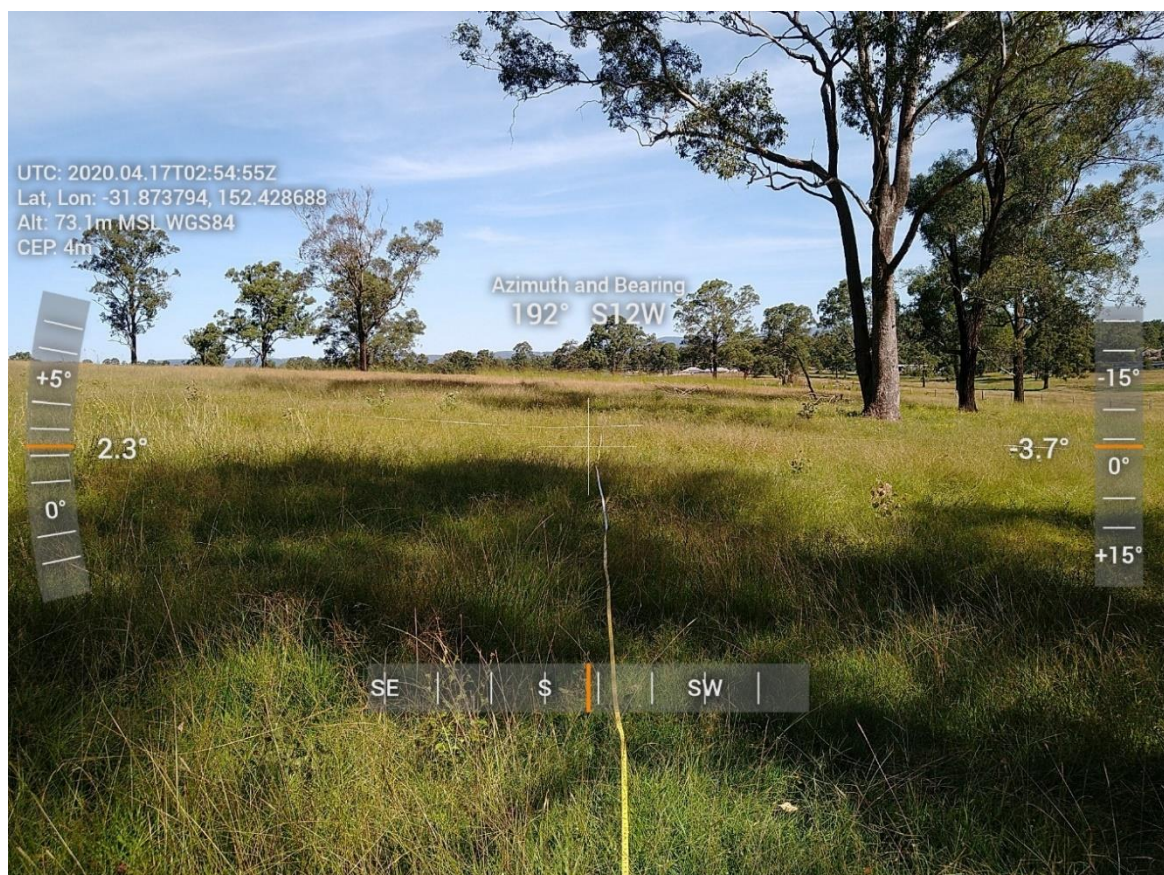


Photo 2: Zone 2 PCT 3329 (Poor) – Plot 2



Photo 3: Zone 2 PCT 3329 (Poor) – Plot 5



Photo 4: Zone 3 Low Condition – Plot 3



Photo 5: Zone 3 Low Condition – Plot 4



Photo 6: Zone 3 Low Condition – Plot 7

3.3.2 Management Zones and Future Vegetation Integrity Scores

Separate management zones have been applied to each applicable vegetation zone where proposal impacts result in partial clearing of a vegetation zone, such as the asset protection zone along the northern boundary and the vegetated riparian zone. The management zones applicable to each vegetation zone are described in **Table 3.5**. The future vegetation integrity scores for each vegetation zone are provided in **Appendix II**. The location of the management zones is shown in **Figure 5.1**.

Table 3.5: Description of Management Zones

Vegetation Zone	Applicable Management Zone
Zone 1: PCT 3329 (Moderate)	VZ1 MZ1 - Asset Protection Zone (APZ): This zone covers the entirety of Zone 1. It has been assumed that the canopy coverage would be reduced by 15% and the understorey would be maintained as managed grass, assumedly with a similar composition and cover to the pasture occurring throughout Zones 2 and 3. Future composition and coverage scores for the understorey component were determined by averaging the scores of Vegetation Zones 2 and 3. The resulting Future VIS for this zone was 22.1.
Zone 2: PCT 3329 (Poor)	VZ2 MZ1 - Asset Protection Zone (APZ): This zone covers areas of Zone 2 occurring within the APZ along the northern boundary and within the vegetated riparian zone which would also be maintained as an APZ. No tree removal is required and the ground cover would be similar, although tree regeneration would be absent. Future composition and coverage scores for the understorey component were determined by maintaining the current average scores of Zone 2 and removing any tree regeneration. The resulting Future VIS for this zone was 15. VZ2 MZ2 – Development area (Direct) - This zone covers areas directly impacted by the proposal footprint. It is assumed that the VIS is reduced to 0.

3.3.3 Scattered Trees

The BAM streamlined assessment module for scattered trees can be used to assess the impact to scattered trees where the vegetation within the site meets specific criteria. The applicability of the Scattered Tree Assessment Module is considered in **Table 3.6**.

Table 3.6: Applicability of the BAM Scattered Tree Streamlined Assessment Module

Scattered Tree Criteria	Comment
a) have a foliage cover that is less than 25% of the benchmark for tree cover for the most likely plant community type and are on category 2-regulated land and surrounded by category 1-exempt land on the Native Vegetation Regulatory Map under the LLS Act, or	Not applicable. The site is excluded land for the purposes of the LLS Act.
b) have a DBH of greater than or equal to 5 cm and are located more than 50 m away from any living tree that is greater than or equal to 5 cm DBH, and are completely separated by 100% exotic vegetation, human-made surfaces or bare ground, or	Not applicable.
c) are three or fewer trees that have a DBH of greater than or equal to 5 cm and are within a distance of 50 m of each other, that in turn are greater than 50 m away from the nearest living tree that is greater than or equal to 5 cm DBH, and are completely separated by 100% exotic vegetation, human-made surfaces or bare ground.	The scattered trees present throughout Zone 3 are separated by low condition pasture which is comprised of both native and exotic groundcovers. Plot data shows native species groundcover ranged between 14% and 55%. Consequently, the scattered tree module does not apply as the subject trees are not separately by 100% exotic vegetation, human-made surfaces or bare ground.

3.4 Threatened Ecological Communities

The native vegetation recorded within the proposal area is not associated with any threatened ecological community.

3.5 Weeds

A total of 37 exotic species was recorded within the proposal area. Nine (9) of these are species are BAM listed high threat weeds. Weeds recorded on site are listed in **Appendix I**.

3.6 Habitat Suitability

Habitat condition within the proposal area has been influenced by previous clearing of vegetation and a long history of grazing and agriculture. The site is surrounded by rural and residential development, apart from a relatively large patch of forest that occurs adjacent to the northern boundary and extends further north. The forest to the north provides some connectivity to the patch of trees in the northern part of the site, although this is limited by the disturbed nature of the understorey. The paddock trees throughout the site also provide some connectivity for highly mobile species. Key habitat features recorded within the proposal area include:

- Mature eucalypt trees - may provide seasonal roosting and/or nesting, and/or foraging and/or breeding habitat for a range of birds, mammals, reptiles and frogs.
- Hollow-bearing trees – no obvious hollows were recorded within the trees on site; however, trees with dead branches may have cracks and crevices or exfoliating bark that may provide cover for

microchiropteran bats. A termite nest with holes indicative of nesting Kookaburras or Kingfishers was also recorded within the site. Details of trees occurring within the proposal area are provided in the tree schedule in **Appendix VIII**.

- Koala feed trees – the trees on site may provide potential foraging habitat for local Koalas. A Koala Assessment Report prepared to address the requirements of Chapter 3 of *SEPP (Biodiversity and Conservation) 2021* is provided in **Appendix VII**.
- Ephemeral drainage line – whilst heavily disturbed, the drainage line may provide seasonal habitat common frogs, reptiles and birds.
- Dams - the dams within the proposal area may provide some habitat for a range of frogs, reptiles and wetland birds. The dams also provide a freshwater resource for native fauna and may provide potential foraging habitat for Southern Myotis which is known to occur in the local area.
- Cleared grassland areas – may provide foraging resources for a range of ground-foraging birds and terrestrial mammals.

Also, there were:

- No scratches on trees indicative of use by arboreal mammals and reptiles.
- No scars observed on trees characteristic of feeding by Gliders.
- No raptor nests.

4. THREATENED SPECIES

Following input of the landscape analysis and plot data into the BAM Calculator (BAM-C), a list of threatened species with potential to occur at the site was generated. This identified that 24 predicted species (ecosystem credit species) and 28 candidate species (species credit species) required consideration for assessment.

4.1 Ecosystem Credit Species

The following ecosystem credit species were returned by the calculator as being associated with the PCTs present on the development site (**Table 4.1**). Targeted surveys are not required for ecosystem credit species and each of these species was assumed to have habitat and contribute towards ecosystem credit calculations. No ecosystem credit species were excluded from the assessment. Two additional ecosystem species were included for assessment due to the presence of potential foraging habitat. These were *Falsistrellus tasmaniensis* (Eastern False Pipistrelle) and *Scoteanax rueppellii* (Greater Broad-nosed Bat).

Table 4.1: Ecosystem credit species returned by BAM-C

Scientific Name	Common Name	Dual Credit Species – Foraging Only	Sensitivity To Gain Class ¹
<i>Anthochaera phrygia</i>	Regent Honeyeater	✓	High
<i>Artamus cyanopterus cyanopterus</i>	Dusky Woodswallow		Moderate
<i>Calyptorhynchus lathami lathami</i>	Glossy Black-Cockatoo	✓	High
<i>Chthonicola sagittata</i>	Speckled Warbler		High
<i>Circus assimilis</i>	Spotted Harrier		Moderate
<i>Climacteris picumnus victoriae</i>	Brown Treecreeper		High
<i>Coracina lineata</i>	Barred Cuckoo-shrike		Moderate
<i>Daphoenositta chrysoptera</i>	Varied Sittella		Moderate
<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork		Moderate
<i>Glossopsitta pusilla</i>	Little Lorikeet		High
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	✓	High
<i>Hieraaetus morphnoides</i>	Little Eagle	✓	Moderate
<i>Hirundapus caudacutus</i>	White-throated Needletail		High
<i>Lathamus discolor</i>	Swift Parrot	✓	Moderate
<i>Lophoictinia isura</i>	Square-tailed Kite	✓	Moderate
<i>Melithreptus gularis gularis</i>	Black-chinned Honeyeater		Moderate
<i>Pandion cristatus</i>	Eastern Osprey	✓	Moderate
<i>Petroica boodang</i>	Scarlet Robin		Moderate
<i>Ptilinopus magnificus</i>	Wompoo Fruit-Dove		Moderate
<i>Stagonopleura guttata</i>	Diamond Firetail		Moderate
<i>Dasyurus maculatus</i>	Spotted-tailed Quoll		High
<i>Thylogale stigmatica</i>	Red-legged Pademelon		High

Scientific Name	Common Name	Dual Credit Species – Foraging Only	Sensitivity To Gain Class ¹
<i>Micronomus norfolkensis</i>	Eastern Coastal Free-tailed Bat		High
<i>Miniopterus australis</i>	Little Bent-winged Bat	✓	High
<i>Miniopterus orianae oceanensis</i>	Large Bent-winged Bat	✓	High
<i>Pseudomys gracilicaudatus</i>	Eastern Chestnut Mouse		High
<i>Petaurus australis</i>	Yellow-bellied Glider		High
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	✓	High
<i>Phoniscus papuensis</i>	Golden-tipped Bat		High
Species added due to presence of suitable habitat			
<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle		High
<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat		High

Note 1: Sensitivity to Gain Class. For explanation, see Appendix I of the BAM 2020

4.2 Species Credit Species

4.2.1 Candidate species to be assessed

Threatened species classified as species credit species and identified by the BAM as potentially occurring in the subject land are considered in **Table 4.2**.

Candidate species can be excluded from further consideration if:

- Required habitat/geographical constraints are absent (as identified in the BioNet database); or
- The field assessment determines that microhabitats required by a species are absent or are degraded to the point that the species is unlikely to use the subject land or specific vegetation zone (see BAM Section 5.2.3); or
- An expert report states that the species is unlikely to be present on the subject land or specific vegetation zones.

Candidate species identified for further assessment requiring confirmation of presence or absence within the site are considered in **Table 4.3**.

Table 4.2: Assessment of the habitat constraints for potential candidate species

Scientific name	Common name	BC Act	EPBC Act	Dual credit species	Sources	Habitat Constraints / Geographic Limitations	Species retained for further assessment?	Reason for exclusion from further assessment
<i>Anthochaera phrygia</i>	Regent Honeyeater	CE	CE	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Important habitat map	No	Habitat constraints The proposal area is not located within an area mapped as important habitat for this species. Species has been retained as an ecosystem credit species as marginal foraging habitat is available within the site.
<i>Burhinus grallarius</i>	Bush-Stone-curlew	E		No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Fallen/standing dead timber including logs	No	Habitat constraints The disturbed understorey throughout the proposal area lacks fallen and standing dead timber including logs required by this species.
<i>Calyptorhynchus lathami</i>	Glossy Black-Cockatoo (Breeding)	V	V	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Hollow bearing trees Living or dead tree with hollows greater than 15cm diameter and greater than 8m above ground	No	Habitat constraints No trees with hollows suitable for breeding. Retained as an ecosystem credit species given the presence of marginal foraging habitat.
<i>Cercartetus nanus</i>	Eastern Pygmy-possum	V		No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey		No	Degraded Habitat Found in wet and dry eucalypt forest, subalpine woodland, coastal <i>Banksia</i> sp. woodland and heath. They feed largely on nectar and pollen collected from banksias, eucalypts and bottlebrushes supplemented by insect and soft fruits. Habitat is degraded given the absence of hollows and the disturbed and open nature of the understorey which lacks preferred food species.

Scientific name	Common name	BC Act	EPBC Act	Dual credit species	Sources	Habitat Constraints / Geographic Limitations	Species retained for further assessment?	Reason for exclusion from further assessment
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat (Breeding)	V	V	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Cliffs Within two kilometres of rocky areas containing caves, overhangs, escarpments, outcrops, or crevices, or within two kilometres of old mines or tunnels	No	Habitat constraints. No suitable roosting habitat occurs within 2km of the proposal area. Retained as an ecosystem credit species given the presence of potential foraging habitat.
<i>Dromaius novaehollandiae</i>	Emu (endangered population)	E			☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey		No	Species is vagrant The proposal area is located outside of the known range area of this species. The species was formerly widespread in north-eastern NSW, but is now restricted to coastal and near-coastal areas between Evans Head and Red Rock and a small isolated population further west in the Bungawalbin area. Also known from the Port Stephens area but it is not known if this population continues to persist (TBDC).
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle (Breeding)	V		Yes	☐ BAM-C ☐ TBDC ☐ Previous survey ☒ Current survey	Living or dead mature trees within suitable vegetation within 1km of rivers, lakes, large dams or creeks, wetlands and coastlines	Partial (when a species is retained within one vegetation zone but not another)	Habitat constraints Suitable breeding habitat is limited to vegetation zones with living or dead mature trees.
<i>Hieraaetus morphnoides</i>	Little Eagle (Breeding)	V		Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Nest trees - live (occasionally dead) large old trees within vegetation)	Partial (when a species is retained within one vegetation zone but not another)	Habitat constraints Suitable breeding habitat is limited to vegetation zones with living or dead mature trees.

Scientific name	Common name	BC Act	EPBC Act	Dual credit species	Sources	Habitat Constraints / Geographic Limitations	Species retained for further assessment?	Reason for exclusion from further assessment
<i>Lathamus discolor</i>	Swift Parrot (Breeding)	E	CE	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	As per Important Habitat Map	No	Habitat constraints. The proposal area is not located within an area mapped as important habitat for this species. Species has been retained as an ecosystem credit species as marginal foraging habitat is available within the site.
<i>Litoria aurea</i>	Green and Golden Bell Frog	E	V	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Within 1km of semi-permanent/ ephemeral wet areas, swamp or waterbodies	No	Degraded habitat. The dams on site are isolated, lack emergent vegetation, and the surrounding habitat is too degraded to support this species.
<i>Lophoictinia isura</i>	Square-tailed Kite (Breeding)	V		Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Large live old trees for nesting within suitable habitat	Partial (when a species is retained within one vegetation zone but not another)	Habitat constraints Suitable breeding habitat is limited to vegetation zones with living or dead mature trees.
<i>Miniopterus australis</i>	Little Bent-winged Bat (Breeding)	V		Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☒ Current survey	Cave, tunnel, mine, culvert or other structure known or suspected to be used for breeding including species records with microhabitat code "IC - in cave;" observation type code "E nest-roost;" with numbers of individuals >500	No	Habitat constraints No suitable roosting habitat occurs within 2km of the proposal area. Retained as an ecosystem credit species given the presence of potential foraging habitat.

Scientific name	Common name	BC Act	EPBC Act	Dual credit species	Sources	Habitat Constraints / Geographic Limitations	Species retained for further assessment?	Reason for exclusion from further assessment
<i>Miniopterus orianae oceanensis</i>	Large Bent-winged Bat (Breeding)	V		Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☒ Current survey	Cave, tunnel, mine, culvert or other structure known or suspected to be used for breeding including species records with microhabitat code "IC - in cave;" observation type code "E nest-roost;" with numbers of individuals >500	No	Habitat constraints No suitable roosting habitat occurs within 2km of the proposal area. Retained as an ecosystem credit species given the presence of potential foraging habitat.
<i>Myotis macropus</i>	Southern Myotis	V		No	☒ BAM-C ☐ TBDC ☐ Previous survey ☒ Current survey	Waterbodies with permanent pools/stretches 3m or wider, including rivers, large creeks, billabongs, lagoons, estuaries, dams and other waterbodies, on or within 200m of the site	Partial (when a species is retained within one vegetation zone but not another)	Habitat constraints Suitable habitat is limited to native vegetation occurring within 200m of suitable waterbodies. The permanent dams within the site provide suitable foraging habitat. Small ephemeral dams were excluded as pools greater than 3m wide were generally absent.
<i>Ninox connivens</i>	Barking Owl	V		Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Hollow bearing trees Living or dead trees with hollows greater than 20 cm diameter and greater than 4m above the ground	No	Habitat constraints No potential breeding habitat occurs within the proposal area.
<i>Ninox strenua</i>	Powerful Owl (Breeding)	V		Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Hollow bearing trees Living or dead trees with hollow greater than 20cm diameter	No	Habitat constraints No potential breeding habitat occurs within the proposal area.

Scientific name	Common name	BC Act	EPBC Act	Dual credit species	Sources	Habitat Constraints / Geographic Limitations	Species retained for further assessment?	Reason for exclusion from further assessment
<i>Pandion cristatus</i>	Eastern Osprey (Breeding)	V		Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Presence of stick-nests in living and dead trees (>15m) or artificial structures within 100m of a floodplain for nesting	No	Habitat constraints Large stick-nests, indicative of historical breeding, were not recorded within the proposal area. Retained as an ecosystem credit species given the presence of suitable hunting habitat.
<i>Petauroides volans</i>	Southern Greater Glider	E	E	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey		Partial (when a species is retained within one vegetation zone but not another)	Habitat constraints / Degraded habitat Suitable habitat is limited to vegetation zones with mature trees.
<i>Petaurus norfolcensis</i>	Squirrel Glider	V		No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey		Partial (when a species is retained within one vegetation zone but not another)	Habitat constraints / Degraded habitat Suitable habitat is limited to vegetation zones with mature trees.
<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby	E	V	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Land within 1 km of rocky escarpments, gorges, steep slopes, boulder piles, rock outcrops or cliffines	No	Habitat constraints No suitable habitat occurs within 1 km of the proposal area.
<i>Phascogale tapoatafa</i>	Brush-tailed Phascogale	V		No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey		Partial (when a species is retained within one vegetation zone but not another)	Habitat constraints / Degraded habitat Suitable habitat is limited to vegetation zones with mature trees.
<i>Phascolarctos cinereus</i>	Koala	E	E	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Presence of koala use trees	Partial (when a species is retained within one vegetation zone but not another)	Habitat constraints Suitable habitat is limited to vegetation zones with mature trees.

Scientific name	Common name	BC Act	EPBC Act	Dual credit species	Sources	Habitat Constraints / Geographic Limitations	Species retained for further assessment?	Reason for exclusion from further assessment
<i>Planigale maculata</i>	Common Planigale	V		No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey		No	Degraded Habitat Inhabit rainforest, eucalypt forest, heathland, marshland, grassland and rocky areas where there is surface cover, and usually close to water. Suitable habitat is absent given the disturbed nature of the understorey which is grazed and lacks any surface cover.
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox (Breeding)	V	V	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Breeding camps	No	Habitat constraints No breeding camps are known to occur within the vicinity of the proposal area. The nearest known camp is located at Wingham Brush Nature Reserve (Camp ID 93) (DCCEEW, 2023).
<i>Tyto novaehollandiae</i>	Masked Owl (Breeding)	V		Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Hollow bearing trees Living or dead trees with hollows greater than 20cm diameter	No	Habitat constraints No potential breeding habitat occurs within the proposal area.
<i>Vespadelus troughtoni</i>	Eastern Cave Bat	V		No	☒ BAM-C ☐ TBDC ☐ Previous survey ☒ Current survey	Caves Within 2 km of rocky areas containing caves, overhangs, escarpments, outcrops, crevices or boulder piles, or within two kilometres of old mines, tunnels, old buildings or sheds."	No	Habitat constraints No suitable roosting habitat occurs within 2km of the proposal area. Retained as an ecosystem credit species given the presence of potential foraging habitat.

Scientific name	Common name	BC Act	EPBC Act	Dual credit species	Sources	Habitat Constraints / Geographic Limitations	Species retained for further assessment?	Reason for exclusion from further assessment
FLORA								
<i>Diuris flavescens</i>	Pale Yellow Doubletail	CE	CE	No	☐ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey		Partial (when a species is retained within one vegetation zone but not another)	Degraded habitat Known only from and endemic to the Wingham-Tinonee - Burrell Creek area, incl. Kiwarra State Forest, on the mid-north coast of New South Wales (TBDC). Potential habitat is limited to Vegetation Zone 1 where some native understorey species persist. The remainder of the site is too degraded to support this species as the understorey is dominated by exotic groundcovers. This species was added to the BAM-C candidate species list given the proximity of the site to known populations. The nearest known population of this species occurs approx. 3.5 km to the west of the proposal area.
<i>Eucalyptus largeana</i>	Craven Box	V	V	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey		Partial (when a species is retained within one vegetation zone but not another)	Degraded habitat Potential habitat is limited to wooded areas. Habitat within identified low condition grassland areas is too degraded to support this species given the existing management practices and absence of woody vegetation.
<i>Eucalyptus seeana</i> - endangered population		E2		No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Greater Taree LGA	Partial (when a species is retained within one vegetation zone but not another)	Degraded habitat Potential habitat is limited to wooded areas. Habitat within identified low condition grassland areas is too degraded to support this species given the existing management practices and absence of woody vegetation.
<i>Pterostylis chaetophora</i>	Pterostylis chaetophora	V		No	☒ BAM-C ☐ TBDC		Partial (when a species is retained)	Degraded habitat

Scientific name	Common name	BC Act	EPBC Act	Dual credit species	Sources	Habitat Constraints / Geographic Limitations	Species retained for further assessment?	Reason for exclusion from further assessment
					☐ Previous survey ☐ Current survey		within one vegetation zone but not another)	Potential habitat is limited to Vegetation Zone 1 where some native understorey species persist. Habitat within identified grassland areas is too degraded to support this species given the existing management practices and vegetation cover is largely exotic.
<i>Rhodamnia rubescens</i>	Scrub Turpentine	CE	CE	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey		Partial (when a species is retained within one vegetation zone but not another)	Degraded habitat Potential habitat is limited to wooded areas where the base of trees provides some cover from regular understorey maintenance. Habitat within identified grassland areas is too degraded to support this species given the existing management practices and absence of woody vegetation.

Table 4.3: Consideration of candidate species requiring confirmation of presence or absence

Species	Habitat notes and survey requirements (DPE TBDC)	Recommended Survey Period	Surveyed?	Species Present?	Comments
FAUNA					
<i>Haliaeetus leucogaster</i> White-bellied Sea-Eagle (Breeding)	Breeding habitat is live large old trees within 1km of a rivers, lakes, large dams or creeks, wetlands and coastlines AND the presence of a large stick-nest within tree canopy; or an adult with nest material; or adults observed duetting within breeding period.	Jul-Dec	Yes (April, May and August, October)	No (Surveyed)	No offsets required. Large stick-nests, indicative of historical breeding, were not recorded within the proposal area. Retained as an ecosystem credit species given the proximity to suitable hunting habitat.
<i>Hieraaetus morphnoides</i> Little Eagle (Breeding)	Breeding habitat is live (occasionally dead) large old trees within suitable vegetation AND the presence of a male and female; or any adult with nesting material; or an individual on a large stick nest in the top half of the tree canopy; or pairs displaying (soaring, diving, engaging in chases, or a male observed calling in flight with a female begging from tree).	Aug-Oct	Yes (April, May and August, October)	No (Surveyed)	No offsets required. Large stick-nests, indicative of historical breeding, were not recorded within the proposal area. Retained as an ecosystem credit species given the presence of suitable hunting habitat.
<i>Lophoictinia isura</i> Square-tailed Kite (Breeding)	Breeding habitat is live large old trees within suitable vegetation AND the presence of a male and female; or female with nesting material; or an individual on a large stick-nest in the top half of the tree canopy.	Sep-Jan	Yes (April, May and August, October)	No (Surveyed)	No offsets required. Large stick-nests, indicative of historical breeding, were not recorded within the proposal area. Retained as an ecosystem credit species given the presence of suitable hunting habitat.
<i>Myotis macropus</i> Southern Myotis	Hollow bearing trees, bridges, caves, or artificial structures within 200 metres of riparian zone or waterbody including rivers, creeks, billabongs, lagoons, dams with pools 3m wide or greater.	Oct-Mar	Yes Bat-call survey (Oct-Nov)	Yes (Surveyed)	Offsets required. Calls characteristic of this species were identified from recordings over foraging habitat within the proposed VRZ.
<i>Petauroides volans</i> Southern Greater Glider	Hollow dependent species that will have large trees with hollows within its home range. Home range is <5 ha and typically 1 to 3 ha.	All Year	Yes (Wildlife camera survey, and habitat tree survey)	No (Surveyed)	No offsets required. This species was not recorded during surveys and nesting habitat within the site is absent given the lack of suitable hollows.

Species	Habitat notes and survey requirements (DPE TBDC)	Recommended Survey Period	Surveyed?	Species Present?	Comments
<i>Petaurus norfolcensis</i> Squirrel Glider	Relies on large old trees with hollows for breeding and nesting. These trees are also critical for movement and typically need to be closely-connected (i.e., no more than 50m apart).	All year	Yes (Wildlife camera survey, and habitat tree survey)	No (Surveyed)	No offsets required. This species was not recorded during surveys and nesting habitat within the site is absent given the lack of suitable hollows.
<i>Phascogale tapoatafa</i> Brush-tailed Phascogale	Low population densities, large home range size, annual male die-off and fluctuating local abundance make Brush-tailed Phascogales difficult to detect reliably. Survey Dec – Jun, noting that Dec – Feb is the main juvenile dispersal period and May – Jun is the peak mating season, when males are most likely to be detected (particularly towards the end of the season, as deceased individuals).	Dec-Jun	Yes (Wildlife camera survey completed in April and May, habitat tree survey)	No (Surveyed)	No offsets required. This species was not recorded during surveys and nesting habitat within the site is absent given the lack of suitable hollows.
<i>Phascolarctos cinereus</i> Koala	Important habitat is defined by the density of koalas and quality of habitat determined by on-site survey.	All Year	Yes (Wildlife camera survey, tree survey, diurnal searches)	No (Surveyed)	No offsets required. No signs of Koala, including scats or scratches on tree trunks, were recorded during targeted surveys. The remnant trees on site include several preferred food trees including <i>E. tereticornis</i> and <i>E. microcorys</i> ; however, connectivity is very limited and the site is unlikely to support core breeding habitat or provide a regular foraging resource.

Species	Habitat notes and survey requirements (DPE TBDC)	Recommended Survey Period	Surveyed?	Species Present?	Comments
FLORA					
<i>Diuris flavescens</i> Pale Yellow Doubletail	Grows in grassy tall eucalypt forest with Kangaroo Grass and Blady Grass on brown clay soil. Survey mid-September to early October. Peak flowering often late September to early-mid October. Use of reference populations to hone in survey timing is strongly recommended.	Sep-Nov	Yes October	No (Surveyed)	No offsets required. No specimens recorded during targeted survey.
<i>Eucalyptus largeana</i> Craven Box	Confined to Gloucester-Craven district and near Pokolbin, although a number of unsubstantiated records exist from outside the currently accepted range. Populations are known from Copeland Tops State Conservation Area and Berrico Nature Reserve, with unconfirmed records from Talawahl and Glen Nature Reserves and Willi Willi National Park. The majority of remaining populations occur on private lands and roadsides, often as single trees or small clumps interspersed with other tree species. Often found in wet forest on subcoastal ranges.	All Year	Yes Apr-May	No (Surveyed)	No offsets required. No specimens recorded during targeted survey.
<i>Eucalyptus seeana</i> - endangered population in the Greater Taree LGA	Within the Greater Taree LGA, the population is sporadic in distribution, consisting mainly of scattered trees but with some denser stands. A small part of the population occurs in Brimbin Nature Reserve and in a Council reserve.	All Year	Yes Apr-May	No (Surveyed)	No offsets required. No specimens recorded during targeted survey.
<i>Pterostylis chaetophora</i>	Preferred habitat is seasonally moist, dry sclerophyll forest with a grass and shrub understorey. The most commonly observed habitat is vegetation characterised by grassy open forests or derived native grasslands of <i>Eucalyptus amplifolia</i> and <i>E. moluccana</i> on gentle flats, or that are dominated by <i>Corymbia maculata</i> with any of <i>E. fibrosa</i> , <i>E. siderophloia</i> or <i>E. crebra</i> .	Sep-Nov	Yes October	No (Surveyed)	No offsets required. No specimens recorded during targeted survey.

Species	Habitat notes and survey requirements (DPE TBDC)	Recommended Survey Period	Surveyed?	Species Present?	Comments
<i>Rhodamnia rubescens</i> Scrub Turpentine	Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils. Flowering and fruiting has been severely affected by myrtle rust infection. Most individuals are no longer flowering or setting seeds since infected. Infected plants may resprout and survive. Defoliated plants may be hard to identify. Seedling recruitment does not appear to be happening due to the extremely high susceptibility of germinating seedlings to myrtle rust infection.	All Year	Yes Mar-Jul	No (Surveyed)	No offsets required. No specimens recorded during targeted survey.

4.2.2 Targeted Surveys

Where a potential candidate species is considered to have potential to occur, and it is not assumed to occur for the purposes of the BAM-C, a targeted survey is required to verify its presence or absence. The field surveys and methods used to target threatened flora and fauna are detailed in **Table 4.4.** Where assessment was not sufficient to confirm the absence of species, the species was assumed to be present.

4.2.2.1 Field Surveys

The methodology for the targeted surveys undertaken is summarised in **Table 4.4.** A full list of species recorded during field surveys is provided in **Appendix II.**

Table 4.4: Field surveys conducted on site

Group	Surveys	Methods and Survey Effort	Candidate Species Targeted
Diurnal Birds	Area search	Area searches were undertaken to identify any birds present. These surveys were undertaken for 20-minute periods and recorded birds occurring within the vicinity (about 1 hectare). Birds were identified from observation or call identification. A search for nests was also undertaken during tree surveys.	Woodland birds Raptors
Herpetofauna	Habitat search	Opportunistic active searches for frogs and reptiles were undertaken during the survey within suitable habitat (i.e., leaf litter, under rocks and long grass).	
Mammals	Wildlife Cameras and Hair tubes	Four wildlife cameras were deployed targeting arboreal mammals. The cameras were positioned towards baited hair tubes within the remnant woodland in the north of the site. The cameras and hair tubes were left in place for 20 consecutive nights giving a total 80 trap nights.	Brush-tailed Phascogale Squirrel Glider Koala
	Bat echo-location recording	Bat echo-location calls were recorded over 22 consecutive nights. The bat detector was positioned along the edge of a dam to target foraging Southern Myotis and other microbats. All calls were analysed by Luke Pickett using Kaleidoscope software.	Southern Myotis
	Search for scats and signs	A search for scats and other signs of animal use (e.g., scratches on trees, echidna and bandicoot diggings) was undertaken during the site survey.	Brush-tailed Phascogale Squirrel Glider Koala
	Koala SPOT search	A Koala SPOT search was conducted on site and involved visiting preferred Koala feed trees and checking for scratches and Koala scats. This was undertaken in conjunction with the tree surveys.	Koala

Group	Surveys	Methods and Survey Effort	Candidate Species Targeted
Flora	Targeted surveys	Targeted surveys for threatened flora were undertaken in April and May over two separate days. These surveys involved inspecting each tree and shrub within the site and traversing suitable habitat in 5 - 20 m wide parallel transects, depending on visibility and the size of the target species.	Threatened flora
		A seasonal targeted survey was undertaken in early October 2020 and late October 2023 throughout VZ1. The survey targeted threatened orchids with potential to occur in the local area despite the area being highly degraded. The surveys involved a traverse of the woodland habitat in the north of the site in 5 - 10 m wide parallel transects.	Cryptic Flora <i>Diuris flavescens</i> <i>Pterostylis chaetophora</i>
Hollow dependent species	Habitat Tree Survey	A habitat tree survey was undertaken in conjunction with the tree surveys. No obvious hollows were recorded within the proposal area.	
All	Opportunistic sightings	Any opportunistic sightings of fauna on site were recorded.	

4.2.2.2 Survey Timing

A summary of the field surveys undertaken for this report and the prevailing weather conditions at the time is provided below in **Table 4.5**. A map showing survey effort items (as completed by Accuplan) including trap locations, targeted flora searches, plots and habitat trees is provided at **Figure 4.1**.



Figure 4.1: Targeted survey locations showing vegetation zones, scattered trees and vegetation plots

Table 4.5: Survey Dates, Times, Activities and Weather Conditions

Date	Time	Activity	Weather ¹
Friday 17/04/2020	0830 – 1700	Wildlife camera deployment Hair tube deployment Microbat recorder deployment Diurnal bird survey Vegetation survey (Meander) Vegetation Plots 1 to 3 Incidental Observations	0-3/8 Cloud cover Wind – SE Temp – 16-22°C
Thursday 23/04/2020	0800 - 0830	Inspection of eastern drainage line	0/8 Cloud cover Temp 16°C
Thursday 07/05/2020	0830 – 1700	Retrieve wildlife cameras Retrieve hair tubes Retrieve microbat recorder Vegetation Plots 4 to 7 Diurnal bird survey Tree and targeted flora survey Bird and nest searches	0-2/8 Cloud cover Wind – SW Temp - 25°C
Friday 09/10/2020	0830 – 0930	Targeted flora survey (<i>Diuris flavescens</i>)	Clear Calm Temp – 20°C
Monday 14/08/2023	0830 – 0930	Site inspection to ascertain current condition of site	2/8 Cloud cover Wind – SE Temp – 17°C
Tuesday 24/10/2023	1100 – 1145	Microbat recorder deployment	Clear Wind – NE Temp – 28°C
Monday 30/10/2023	0830 - 0930	Targeted flora survey (<i>Pterostylis chaetophora</i>)	Clear Wind –E Temp – 20°C
Wednesday 15/11/2023	1000 - 1030	Microbat recorder retrieval	2/8 Cloud cover Wind –W Temp – 22°C

Note 1: On-site observation and / or Taree Airport AWS (Station ID 060141) weather data

4.2.3 Threatened Species Polygons

Candidate species subject to offsetting are summarised in **Table 4.6**. Species polygons were prepared for each species in accordance with Section 5.2.5 of the BAM (DPIE, 2020) and these are used to calculate the required species credits which are summarised in **Table 5.3** and **Table 7.2**. The species polygons are provided in **Appendix X**.

Table 4.6: Summary of species polygons

Species	Justification why species credits apply	Species Polygon
<i>Myotis macropus</i> Southern Myotis	Recorded within subject site. The dams provide suitable foraging habitat. Impacts to trees occurring within 200m of suitable foraging habitat are subject to offsetting.	The species polygon captures all woody vegetation habitat on the subject land occurring within 200m of a suitable waterbody with pools or stretches 3m or wider. This includes the permanent dams on site and the large dams located on the adjoining land to the west and north. Species polygon boundaries align with associated PCTs (3329) and scattered trees that are within 200m of mapped waterbodies. Low condition grassland and management zones where trees shall be retained were excluded from the polygon

4.3 Threatened Species Search Area Results

Database searches (Licenced Bionet, BAM-C, and EPBC protected matters databases) identified 94 threatened species with potential to occur in the local area (10 km radius around the proposal site) (see **Table 4.7**). A habitat assessment determining the likelihood of these species to be impacted by the proposed works is provided in **Appendix III**. No additional species credit species were considered likely to occur or have important habitat available within the proposal area. Two additional ecosystem species were included for assessment due to the presence of potential foraging habitat. These were *Falsistrellus tasmaniensis* (Eastern False Pipistrelle) and *Scoteanax rueppellii* (Greater Broad-nosed Bat).

Table 4.7: Threatened species previously recorded (Bionet) or habitat modelled (EPBC Protected Matters Search) within the search area

Scientific Name	Common Name	BC Act	EPBC Act	Records	Likelihood of occurrence
Flora					
<i>Cynanchum elegans</i>	White-flowered Wax Plant	E1	E	4	Low
<i>Marsdenia longiloba</i>	Clear Milkvine	E	V	0	Unlikely
<i>Parsonsia dorrigoensis</i>	Milky Silkpod	V	E	0	Low
<i>Tylophora woollsii</i>	Cryptic Forest Twiner	E	E	0	Low
<i>Senna acclinis</i>	Rainforest Cassia	E	-	1	Unlikely
<i>Maundia triglochinos</i>		V	-	1	Unlikely
<i>Eucalyptus glaucina</i>	Slaty Red Gum	V	V	9	Low
<i>Eucalyptus largeana</i>	Craven Grey Box	E	E	0	Unlikely
<i>Eucalyptus seeana</i>	Narrow-leaved Red Gum	E2	-	497	Low
<i>Melaleuca biconvexa</i>	Biconvex Paperbark	V	V	0	Unlikely
<i>Rhodamnia rubescens</i>	Scrub Turpentine	CE	CE	22	Unlikely
<i>Rhodomyrtus psidioides</i>	Native Guava	CE	CE	4	Unlikely
<i>Syzygium paniculatum</i>	Magenta Lilly Pilly	E	V	0	Unlikely
<i>Cryptostylis hunteriana</i>	Leafless Tongue-orchid	V	V	0	Unlikely
<i>Diuris flavescens</i>	Pale Yellow Doubletail	CE	CE	122	Unlikely
<i>Genoplesium littorale</i>	Tuncurry Midge Orchid	CE	CE	928	Unlikely
<i>Phaius australis</i>	Lesser Swamp-orchid	E	E	0	Unlikely
<i>Pterostylis chaetophora</i>	-	V	-	6	Unlikely
<i>Rhizanthella slateri</i>	Eastern Underground Orchid	V	E	0	Unlikely
<i>Euphrasia arguta</i>	-	CE	CE	0	Unlikely
<i>Arthraxon hispidus</i>	Hairy-joint Grass	V	V	0	Low
<i>Persicaria elatior</i>	Tall Knotweed	V	V	0	Low
<i>Macadamia integrifolia</i>	Macadamia Nut	-	V	0	Unlikely
<i>Asperula asthenes</i>	Trailing Woodruff	V	V	31	Low

Scientific Name	Common Name	BC Act	EPBC Act	Records	Likelihood of occurrence
<i>Thesium australe</i>	Austral Toadflax	V	V	0	Unlikely
<i>Solanum sulphureum</i>	Manning Yellow Solanum	E	E	55	Unlikely
Frogs					
<i>Litoria aurea</i>	Green and Golden Bell Frog	E	V	3	Unlikely
<i>Mixophyes balbus</i>	Stuttering Frog	E	V	0	Unlikely
<i>Mixophyes iteratus</i>	Giant Barred Frog	E	V	0	Unlikely
Birds					
<i>Chthonicola sagittata</i>	Speckled Warbler	V	-	1	Low
<i>Circus assimilis</i>	Spotted Harrier	V	-	3	Low
<i>Erythrotriorchis radiatus</i>	Red Goshawk	CE	E	0	Low
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	V	-	16	Low
<i>Hieraaetus morphnoides</i>	Little Eagle	V	-	2	Moderate
<i>Lophoictinia isura</i>	Square-tailed Kite	V	-	18	Moderate
<i>Pandion cristatus</i>	Eastern Osprey	V	-	18	Unlikely
<i>Anseranas semipalmata</i>	Magpie Goose	V	-	1	Low
<i>Hirundapus caudacutus</i>	White-throated Needletail	P	V	11	Moderate
<i>Botaurus poiciloptilus</i>	Australasian Bittern	E	E	2	Unlikely
<i>Ixobrychus flavicollis</i>	Black Bittern	V	-	1	Unlikely
<i>Artamus cyanopterus cyanopterus</i>	Dusky Woodswallow	V	-	2	Moderate
<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	V	E	0	Low
<i>Calyptorhynchus lathami lathami</i>	Glossy Black-Cockatoo	V	V	91	Low
<i>Coracina lineata</i>	Barred Cuckoo-shrike	V	-	0	Low
<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	E	-	24	Low
<i>Climacteris picumnus victoriae</i>	Brown Treecreeper	V	V	0	Low
<i>Ptilinopus magnificus</i>	Wompoo Fruit-Dove	V	-	8	Low
<i>Stagonopleura guttata</i>	Diamond Firetail	V	V	0	Low
<i>Falco hypoleucos</i>	Grey Falcon	V	V	0	Unlikely
<i>Haematopus longirostris</i>	Pied Oystercatcher	E	-	1	Unlikely
<i>Irediparra gallinacea</i>	Comb-crested Jacana	V	-	3	Unlikely
<i>Anthochaera phrygia</i>	Regent Honeyeater	CE	CE	2	Low
<i>Grantiella picta</i>	Painted Honeyeater	V	V	0	Unlikely
<i>Melithreptus gularis gularis</i>	Black-chinned Honeyeater	V	-	0	Unlikely
<i>Daphoenositta chrysoptera</i>	Varied Sittella	V	-	12	Moderate
<i>Melanodryas cucullata cucullata</i>	South-eastern Hooded Robin	V	E	0	Low
<i>Petroica boodang</i>	Scarlet Robin	V	-	0	Low
<i>Glossopsitta pusilla</i>	Little Lorikeet	V	-	9	Moderate
<i>Lathamus discolor</i>	Swift Parrot	E	CE	2	Low
<i>Neophema chrysostoma</i>	Blue-winged Parrot	V	V	0	Low
<i>Rostratula australis</i>	Australian Painted Snipe	E	E	0	Low

Scientific Name	Common Name	BC Act	EPBC Act	Records	Likelihood of occurrence
<i>Calidris ferruginea</i>	Curlew Sandpiper	E	CE	0	Unlikely
<i>Numenius madagascariensis</i>	Eastern Curlew	P	CE	1	Unlikely
<i>Ninox connivens</i>	Barking Owl	V	-	5	Low
<i>Ninox strenua</i>	Powerful Owl	V	-	18	Low
<i>Turnix maculosus</i>	Red-backed Button-quail	V	-	2	Low
<i>Tyto novaehollandiae</i>	Masked Owl	V	-	4	Low
<i>Tyto tenebricosa</i>	Sooty Owl	V	-	2	Low
Mammals					
<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	V	E	16	Low
<i>Phascogale tapoatafa</i>	Brush-tailed Phascogale	V	-	44	Moderate
<i>Planigale maculata</i>	Common Planigale	V	-	1	Unlikely
<i>Petaurus australis</i>	Yellow-bellied Glider	V	V	2	Low
<i>Petaurus norfolcensis</i>	Squirrel Glider	V	-	24	Moderate
<i>Phascogale cinereus</i>	Koala	E	E	1133	Moderate
<i>Petauroides volans</i>	Southern Greater Glider	E	E	5	Moderate
<i>Aepyprymnus rufescens</i>	Rufous Bettong	V	-	1	Unlikely
<i>Notamacropus parma</i>	Parma Wallaby	V	V	0	Unlikely
<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby	E	V	0	Unlikely
<i>Potorous tridactylus</i>	Long-nosed Potoroo	V	V	1	Unlikely
<i>Thylogale stigmatica</i>	Red-legged Pademelon	V	-	0	Unlikely
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V	V	416	Moderate
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	V	V	0	Low
<i>Miniopterus australis</i>	Little Bent-winged Bat	V	-	26	Moderate
<i>Miniopterus orianae oceanensis</i>	Large Bent-winged Bat	V	-	13	Moderate
<i>Micronomus norfolkensis</i>	Eastern Coastal Free-tailed Bat	V	-	8	Moderate
<i>Myotis macropus</i>	Southern Myotis	V	-	8	Moderate
<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	V	-	1	Moderate
<i>Phoniscus papuensis</i>	Golden-tipped Bat	V	-	3	Unlikely
<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	V	-	1	Moderate
<i>Pseudomys gracilicaudatus</i>	Eastern Chestnut Mouse	V	-	0	Unlikely
<i>Pseudomys novaehollandiae</i>	New Holland Mouse	P	V	3	Unlikely
Reptiles					
<i>Myuchelys purvisi</i>	Purvis' Turtle	E	E	0	Unlikely

¹ Number of OEH wildlife atlas records in selected area [North: -31.77 West: 152.33 East: 152.53 South: -31.97]

Status Abbreviations

V – Vulnerable

P – Protected

E – Endangered

CE – Critically Endangered

E2 – Endangered Population

5. IMPACT ASSESSMENT

5.1 Avoid and Minimise Potential Impacts

The design of the proposal has implemented the following measures to avoid and minimise impacts to biodiversity:

- The proposal layout is largely sited within existing low condition grassland areas with limited habitat value.
- Remnant vegetation along the northern boundary would be partially retained forming part of the proposed APZ. Large trees (>80 cm DBH) and known food tree species would be preferentially retained within the APZ and the required 15 to 30% canopy coverage would be achieved by removal of trees with lesser habitat value.
- The vegetated riparian zone (VRZ) to be established along the drainage line in the western part of the site forms part of the proposal. The VRZ is highly degraded and revegetation works would be subject to a vegetation management plan (VMP).
- Mitigation measures to minimise impacts to biodiversity are provided in Section 6. These would be embedded in the project consent (if approved) and implemented through a Construction Environmental Management Plan (CEMP) to be developed for the works.

5.2 Direct Impacts

5.2.1 Loss of Native Vegetation

Residual impacts of the proposed subdivision would involve the direct removal of native vegetation, as summarised in **Table 5.1** and shown in **Figure 5.1**. **Table 5.2** summarises the impact of the proposal to the vegetation integrity score of each vegetation zone identified on site.

Table 5.1: Summary of proposal impacts to vegetation

Plant community type (PCT)	Status	Impact Area	Summary of Impacts
<i>PCT 3329 - Northern Hinterland Valleys Red Gum Grassy Forest</i>	Not listed	1.49 ha	1.01 ha to form part of the proposed APZ (limited tree removal) 0.48 ha of relatively poor condition vegetation including 16 isolated trees to be directly removed by proposal.
Low Condition Grassland	Not listed	23.5 ha	Includes the removal of 30 isolated tree occurring throughout the zone. Approximately 1.8 ha to form part of VRZ.

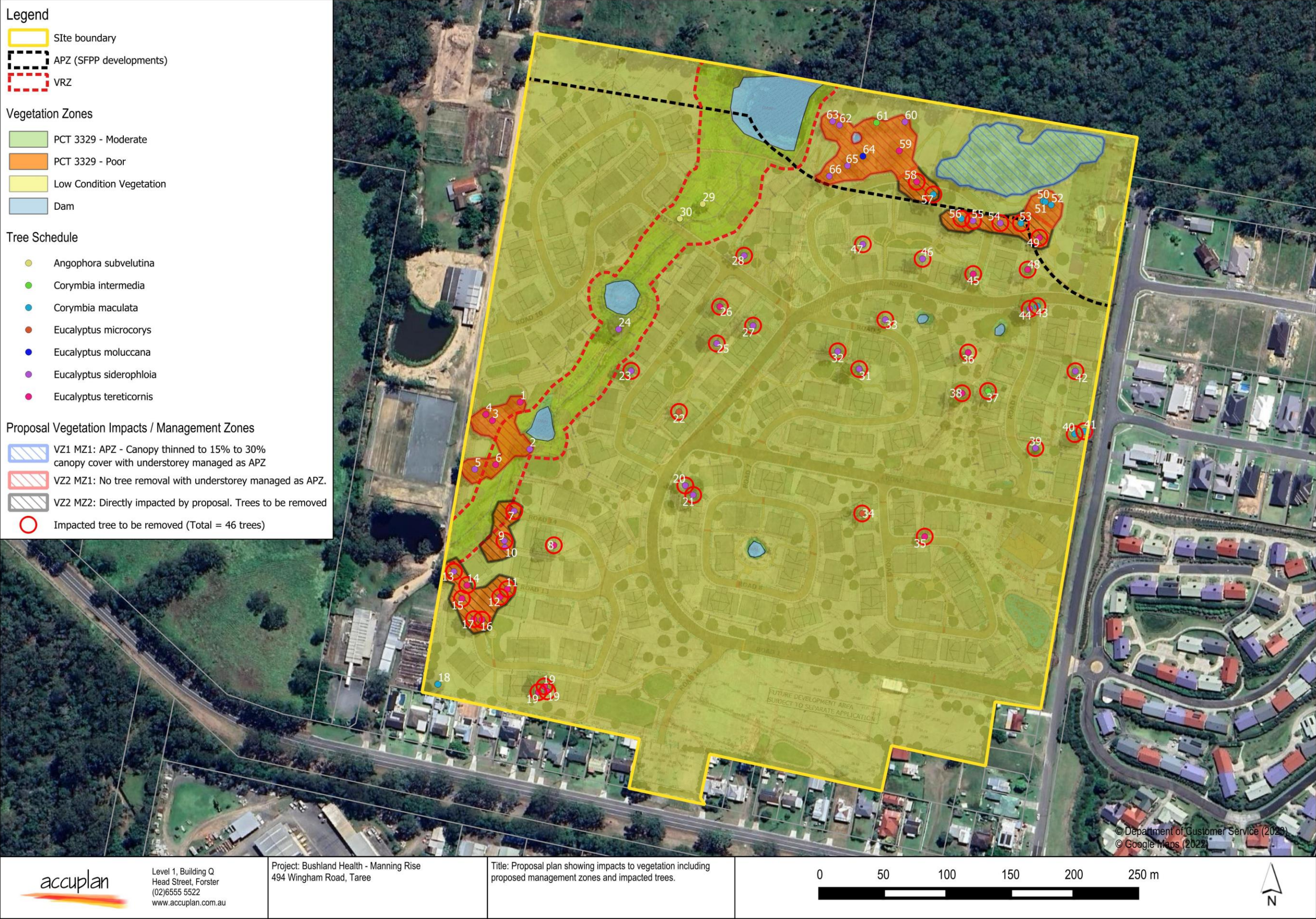


Figure 5.1: Proposal plan showing proposed impacts to vegetation including proposed management zones and impacted trees

Table 5.2: Summary of impact to the vegetation integrity

Vegetation Zone	Management Zone	Current VI score	Future VI score	Change in VI score	Area Impacted (ha)	Total Change in VI Score	BRW ¹
Zone 1: PCT 3329 (Moderate)	MZ1: APZ	53.4	18.9	-34.5	0.48	-34.5	2
Zone 2: PCT 3329 (Poor)	MZ1: APZ	21.4	15	-6.4	0.54	-13.3	2
	MZ2: Direct	21.4	0	-21.4	0.47		2
Zone 3: Low Condition	Direct	6.3	0	-6.3	24	-6.3	2

¹ Biodiversity Risk Weighing (for ecosystem credits). For explanation, see Appendix 7 of the BAM (2017).

5.2.2 Loss of Fauna Habitat

The proposal would impact the following fauna habitat:

- Seasonal foraging resources associated with the trees and shrubs to be impacted.
- Shelter associated with trees identified for removal. The proposal would remove trees with dead branches which may have cracks and crevices or exfoliating bark that may provide cover for microchiropteran bats. A termite nest with holes indicative of nesting Kookaburras or Kingfishers would also be removed. The removal of such habitat has the potential to directly impact fauna that may inhabit the trees and reduce this habitat resource in the local area.
- Three dams present within the site. These dams may provide a seasonal water resource and some isolated wetland habitat. The larger southernmost dam may also provide foraging habitat for the threatened Southern Myotis which was recorded within the proposal area. The removal of this habitat is considered minor given the relatively small area of habitat to be impacted (approx. 200m²) and the retention of larger dams within the proposed VRZ. The proposed stormwater detention basin in the east of the site would also provide similar habitat in the east of the site.

Table 5.3 summarises the impact of the proposal to species credit entities relevant to the proposal.

Table 5.3: Summary of impact to species credit species

Species Credit Species	Status	Species Presence Type	Vegetation Zone (Area)
<i>Myotis macropus</i> Southern Myotis	BC Act – V	Present. The dams provide suitable foraging habitat and trees occurring within 200m of foraging habitat provide cover and potential roosting habitat.	Zone 1 - 3329 (Moderate) (0.4 ha) Zone 2 - 3329 (Poor) (0.32 ha) Zone 3 – Low condition (0.44 ha) Total Area = 1.2 ha

5.3 Indirect Impacts

Indirect impacts occur when the proposal, or activities relating to the construction or operation of the proposal, affect native vegetation, threatened ecological communities and threatened species habitat beyond the subject land. Impacts may also result from changes to land-use patterns, such as an increase in vehicular access and human activity on native vegetation, threatened ecological communities and threatened species habitat. **Table 5.4** describes and assesses the impacts of the proposal on native vegetation and habitat beyond the proposal area as detailed in Section 8.2 of the BAM.

Table 5.4: Assessment of indirect impacts on adjacent habitat

Indirect Impact	Extent and Duration	Threatened species, TECs and their habitats likely to be affected.	Consequences of the impacts for the bioregional persistence of the threatened species, TECs and their habitats.
(a) inadvertent impacts on adjacent habitat or vegetation	Remnant vegetation occurring to the north of the proposal area is already subject to edge effects relating to the existing management of rural land within the site.	Species and habitat associated nearby PCTs.	The proposal is unlikely to further exacerbate impacts to adjacent habitats outside the proposal area, given the existing management of the site.
(b) reduced viability of adjacent habitat due to edge effects	As above.	As above.	As above.
(c) reduced viability of adjacent habitat due to noise, dust or light spill	The proposal has the potential to temporarily increase noise and dust during construction. Construction works would be limited to daytime hours and subject to controls to minimise impacts to adjoining properties. The operation of the proposed seniors living community has the potential to increase light spill from the proposal area.	As above (a)	Construction works would be limited to daytime hours and impacts associated with increased noise and dust would be short-lived and unlikely to significantly affect any resident fauna in adjacent habitats. Increased light spill from the proposed development would be similar to that occurring from the adjoining residential areas to the east and south of the proposal area. Increased light spill would be relatively minor and unlikely to significantly affect local fauna which would be well adapted to such environments.
(d) transport of weeds and pathogens from the site to adjacent vegetation	The proposed construction works and residential land use have the potential to introduce or increase weeds occurrence within the retained and adjoining habitat without appropriate management.	As above (a)	Impacts would be minor given the current condition of the site. Mitigation measures regarding weed and pathogen control have been recommended to minimise these impacts.
(e) increased risk of starvation, exposure and loss of shade or shelter	The proposal is unlikely to increase the risk of these impacts in adjacent habitat areas.	N/A	N/A

Indirect Impact	Extent and Duration	Threatened species, TECs and their habitats likely to be affected.	Consequences of the impacts for the bioregional persistence of the threatened species, TECs and their habitats.
(f) loss of breeding habitats	Removal of large trees is permanent and has the potential to impact small hollows that cannot be detected from the ground. Large trees are also a future source of hollows.	Hollow-dependent species	Loss of hollow-dependent fauna shelter including future sources of hollows. Impact would be minimised by implementing clearing protocols and mitigation measures identified within Section 6.
(g) trampling of threatened flora species	The proposed works would be restricted to the identified proposal area and is unlikely to impact any threatened plants that may occur in adjacent habitats.	N/A	N/A
(h) inhibition of nitrogen fixation and increased soil salinity	The site is already substantially disturbed, and it is unlikely the proposal would further exacerbate these issues.	N/A	N/A
(i) fertiliser drift	It is unlikely the proposal would cause or exacerbate this issue.	N/A	N/A
(j) rubbish dumping	It is unlikely the proposal would further exacerbate this issue.	N/A	N/A
(k) wood collection	It is unlikely the proposal would result in, cause or exacerbate this issue.	N/A	N/A
(l) bush rock removal and disturbance	This issue is not likely to affect the subject land given the absence of bush rock.	N/A	N/A
(m) increase in predatory species populations	It is unlikely that the proposal works will influence or alter predatory populations.	N/A	N/A
(n) increase in pest animal populations	It is unlikely that the proposal will influence or alter pest species populations. Pest animals are likely present within the subject land and adjacent habitats.	N/A	N/A
(o) increased risk of fire	The proposal is unlikely to increase the risk of fire in the local area.	N/A	N/A
(p) disturbance to specialist breeding and foraging habitat, e.g. beach nesting for shorebirds.	No specialist breeding or foraging habitat is present in or adjacent to the proposal area.	N/A	N/A

5.4 Prescribed Biodiversity Impacts

An assessment of prescribed impacts listed under Section 8.3 of the BAM is provided in **Table 5.5**.

Table 5.5: Assessment of prescribed impacts

Prescribed Impact / Feature	Applicable to proposal	Description	Proposal Impact / Consequence(s)	Threatened species, TECs and their habitats likely to be affected.
Impacts to Karst, caves, crevices, cliffs, and other features of geological significance	No	No karst, caves, crevices, cliffs or other geologically significant features are present.	N/A	N/A
Rocks	No	No rocky habitat occurs in the proposal site.	N/A	N/A
Impacts to human-made structures	No	Potential removal of existing dwelling and ancillary buildings.	Buildings may provide potential habitat for microbats although none have been previously recorded within the buildings. Habitat loss is considered minor, and impacts would be minimised by implementing clearing protocols and mitigation measures identified in Section 6.	Microbat species associated with nearby PCTs.
Impacts to non-native vegetation	Yes	Weeds occurring throughout the site would be removed as part of the proposal. The removal of weed species would not result in any significant loss of habitat.	N/A	N/A
Habitat connectivity & movement patterns	Yes	The site is largely cleared and provides limited connectivity through the proposal area, particularly for less mobile species.	Connectivity and movement patterns for highly mobile species (i.e., birds, microbats) are unlikely to be substantially affected by the proposed clearing and habitat for less mobile species is already limited by existing clearing and surrounding land uses. The select retention of trees within the proposal area minimises the proposal's impact to habitat connectivity and movement patterns.	Candidate species (Southern Myotis) Ecosystem species associated with PCT 3329
Water quality, water bodies and hydrological processes	Yes	Potential for increased sedimentation within onsite drainage during construction which could impact downstream environments if not adequately managed.	Minor impact which can be adequately managed by implementing sediment and erosion control measures during construction.	Downstream environments
Wind turbine strikes	N/A	N/A	N/A	N/A
Vehicle strikes	Yes	Internal roads are proposed. Speed limits appropriate for local residential traffic would apply to the proposal.	Impacts to local fauna from vehicle strikes are likely to be avoided through application of appropriate speed limits (40-60 km/h) and responsible driver behaviour.	N/A

5.5 Assessment of Serious and Irreversible Impacts

The proposal is unlikely to impact any threatened ecological community or species at risk of a SAIL.

5.6 Impacts that do Not Require Offsetting

Low condition vegetation (as defined in Section 9.2.1 of the BAM) and exotic vegetation does not require offsetting. The following vegetation zones listed in Table 5.6 are below the low condition threshold and impacts to these zones are not subject to ecosystem credits.

Table 5.6: Low condition vegetation zones not subject to offsetting

Assessed PCT	Condition Class	Area Impacted (ha)	Current VI score	Low Condition VI Threshold
3329	Zone 3: Low Condition	23.5	6.3	17

5.7 Other Relevant Legislation or Planning Policies Requiring Address

5.7.1 SEPP (Biodiversity and Conservation) 2021 - Koala Habitat Protection 2021

Chapter 4 of State Environmental Planning Policy (Biodiversity and Conservation) 2021, Koala Habitat Protection 2021 (referred to hereafter as the Koala SEPP 2021), seeks to address the declining status of Koalas in NSW through better conservation and management of Koala habitat as part of the planning and assessment process.

Within the Mid-Coast LGA, the Koala SEPP 2021 applies to development applications on non-rural zoned land that has an area of more than 1 hectare under the same ownership and has the potential to impact areas that meet the SEPP definition of 'core' Koala habitat. The applicability of the SEPP is outlined in **Table 5.7**.

Table 5.7: Applicability of Koala SEPP 2021

Triggers	Response
1) Is the site in a local government area with no approved Koala Plan of Management?	Yes. The site is located in the Mid-Coast Council Local Government Area and there is no approved Koala Plan of Management in place.
2) The size of the site has an area of at least 1 hectare (including adjoining land within the same ownership)?	Yes. The proposal site exceeds 1 hectare.
3) Does the site contain "core" Koala habitat? Core habitat is defined as: (a) an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable Koala habitat and where Koalas are recorded	Yes. The site is likely to qualify as 'core Koala habitat' as: a) the site likely contains 'highly suitable habitat' as the major components of the canopy are listed Koala tree species, as per Schedule 3 of the

Triggers	Response
as being present at the time of assessment of the land as highly suitable Koala habitat; or (b) an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable Koala habitat and where Koalas have been recorded as being present in the previous 18 years The definition of core Koala habitat under the Koala SEPP 2021 includes a reference to highly suitable habitat. Highly suitable habitat is where 15% or greater of the total number of trees within any Plant Community Type (PCT) are the regionally relevant species of those listed in Schedule 3 of the SEPP.	SEPP, and exceed 15% of the total number of trees. These include <i>Eucalyptus tereticornis</i>, <i>Eucalyptus siderophloia</i>, <i>Corymbia intermedia</i>, <i>Corymbia maculata</i>, <i>Eucalyptus microcorys</i> and <i>Eucalyptus moluccana</i>. b) Forty-two (42) Koala records spanning the previous 18 years (3 Koala generations) occur within 2.5km of the site (BioNet, 2023). Four (4) records occur within forest that provides connectivity to the northern boundary of the site.
4) Is the development likely to have low or no impact on Koalas or Koala habitat? If Yes, further consideration of the Koala SEPP is not required. If No, a Koala Assessment Report is required. A suitably qualified and experienced person must be engaged to survey the land and prepare a Koala Assessment Report.	No. The proposed development involves clearing of native vegetation within potential Koala habitat and does not meet the definition of low impact. A Koala Assessment Report is required and is provided in Appendix VII.

5.7.2 Matters of National Environmental Significance

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) requires approval of the Commonwealth Minister representing the Department of Climate Change, Energy, the Environment and Water (DCCEEW), for actions that may have a significant impact on Matters of National Environmental Significance (MNES).

MNES protected under the EPBC Act include:

- World Heritage properties;
- National Heritage places;
- RAMSAR wetlands of international importance;
- threatened species or ecological communities listed in the EPBC Act;
- migratory species listed in the EPBC Act;
- the Great Barrier Reef Marine Park;
- Commonwealth marine environment; and
- nuclear actions.

Regarding biodiversity, the only MNES relevant to the study area are nationally listed threatened species and ecological communities and migratory species. An assessment of potential impacts relating to MNES is provided in **Appendix V**. The proposal was considered unlikely to have a significant impact on any MNES and a Commonwealth referral under the provisions of the EPBC Act is not warranted.

6. MITIGATION MEASURES

The following mitigation measures are recommended to minimise the ecological impact of the proposal. The following measures are recommended for inclusion in the Construction Environmental Management Plan (CEMP) to be developed for the works.

Table 6.1: Mitigation measures

Item	Environmental safeguards	Risk of Failure ¹	Timing	Responsibility
General	The Construction Environmental Management Plan (CEMP) to be prepared for the works shall include, but not be limited to: - Plans showing areas to be cleared and areas to be protected, including exclusion zones, protected trees and habitat features, and weed management areas. - Pre-clearing requirements including pre-clearing surveys, ecologist supervision and compensatory nest box installation. - Procedures to safely fell habitat trees to avoid and minimise impacts to any resident fauna. - Procedures for unexpected threatened species finds and fauna handling. - Protocols to manage weeds and pathogens. - Sediment and erosion control measures. - Monitoring and reporting requirements. This may include monitoring and reporting of revegetation works, pre-clearance fauna surveys, tree clearance supervision, nest box installation.	Low. Council to approve CEMP.	Pre-construction	Proponent/ Contractor

Item	Environmental safeguards	Risk of Failure ¹	Timing	Responsibility
Vegetation Clearing and Tree Protection	Native vegetation that has been identified for retention will be clearly marked and/or fenced to exclude access and protect the trees during construction. Methods should be detailed in the CEMP including: • Trees protection zones shown on a suitable plan. • Selection of a suitable exclusion fencing and / or tape used to identify protected trees. • Exclusion zone fencing to be placed outside tree protection zones wherever possible. • Communicate the importance of exclusion zones to all site staff and contractors (e.g., in toolbox talks and inductions).	Low	Pre-construction	Proponent/ Contractor
	The selection of trees and shrubs to be retained within the APZ areas is to be undertaken in consultation with a suitably ecologist and bushfire specialist. Preference should be given to retaining large trees and preferred Koala food trees within the APZ.	Low	Pre-construction	Proponent / Contractor
Fauna and Habitat Protection	The following fauna and habitat protection measures would apply to the works: • Suitable fauna protection protocols are to be utilised for any clearing works or demolition of existing human-made structures. This includes requirements for ecologist supervision, the undertaking of pre-clearance/demolition surveys, provision of compensatory nest boxes, procedures to safely fell habitat trees and release areas for any rescued fauna. • The area of clearing work is to be inspected for Koalas and other fauna by an ecologist immediately prior to commencement of any tree felling. If a Koala is present, works are to be suspended until the Koala moves along of its own volition. • Any boundary fencing must allow for the movement of Koalas across the site.	Low	Pre-construction/ construction	Proponent/ Contractor

Item	Environmental safeguards	Risk of Failure ¹	Timing	Responsibility
	Koala proof fencing should be utilised to exclude Koalas from accessing pools if proposed.			
Weed and Pathogen Management	Weed and pathogen control measures should be detailed in the CEMP including: - Weed debris and topsoil containing weed plant material should be stored to best prevent the spread of propagules and disposed of at a registered refuse facility. - Weeds should be separated from native vegetation where native vegetation is to be used for mulch. Weeds are not to be used for mulch. - To prevent the introduction or spread of weeds and pathogens contractors should ensure that all machinery, materials, and personnel are clean and free of any weed propagules prior to entering or leaving the site.	Proponent/ Low	Pre-construction/ construction	Proponent/ Contractor
Water Quality	Appropriate sedimentation and erosion controls must be installed prior to and maintained during vegetation clearing and construction operations.	Low	Pre-construction/ construction	Proponent/ Contractor

7. BIODIVERSITY OFFSET CREDIT REQUIREMENTS

This chapter summarises the impact to PCTs and the number and type of credits required to offset the proposal. The BAM-C reports are provided in **Appendix V**.

7.1 Ecosystem Credits

The ecosystem credits required to offset the proposal are provided in **Table 7.1**.

Table 7.1: Ecosystem credits summary showing matching credit profile

PCT ID	Vegetation Zone Name	Vegetation Class	Vegetation Formation	TEC Status	Offset trading group (BAM Section 10.2, Tables 4 & 5)	Hollow-bearing trees present?	IBRA subregion	Ecosystem Credits
PCT 3329	3329_Moderate	Coastal Valley Grassy Woodlands	Grassy Woodlands	Not a TEC	Coastal Valley Grassy Woodlands - $\geq 70\%$ - $<90\%$ cleared group (including Tier 2 or higher threat status).	No	Karuah Manning	10
	3329_Poor					No		7

The following like-for-like offset rules apply for PCT 1215:

- Any PCT associated with Coastal Valley Grassy Woodlands - $\geq 70\%$ - $<90\%$ cleared group (including Tier 2 or higher threat status). This includes PCTs 618, 1603, 1604, 1691, 3312, 3314, 3315, 3318, 3319, 3320, 3323, 3325, 3327, 3328, 3329, 3330, 3332 and 4052.
- In the IBRA subregions: Karuah Manning, Hunter, Macleay Hastings, Mummel Escarpment and Upper Hunter or any IBRA subregion that is within 100 kms of the outer edge of the impacted site.

7.2 Species Credits

The species credits required to offset the impacts of the proposal are summarised in **Table 7.2**.

Table 7.2: Species credits summary showing matching credit profile.

Species	Kingdom	BC Act Status	EPBC Act Status	IBRA Region	BRW ¹	Credits Required
<i>Myotis macropus</i> Southern Myotis	Fauna	Vulnerable	Not listed	Karuah Manning	2	11

Note 1: Biodiversity Risk Weighing (for species credits). For explanation, see Appendix I of the BAM 2020

7.3 Offset obligation options

There are a number of options available to fulfill the required offset obligations, including:

- Retiring like-for-like credits from an established stewardship site. Like-for-like credits can be sourced by purchasing available credits on the market or by establishing a stewardship site that can generate matching credits. Like-for-like offsetting options are shown in the like-for-like biodiversity credit report generated by the BAM calculator (**Appendix V**).
- If like-for-like credits are not available, credits may be sourced in accordance with the 'variation report' generated by the BAM calculator (**Appendix V**).
- Payment into the Biodiversity Conservation Fund to offset development.
- Funding an approved biodiversity action. This is generally as a last resort, subject to consultation with approval authorities, if all other options are determined to be unsuitable.

8. REFERENCES

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Appendix I - Flora Species List

Flora Species List

The following is a list of all flora species previously recorded within the site. It should be noted that such a list cannot be considered comprehensive, but rather indicative of the flora. A period of some years is often required to identify all species present in an area, particularly for cryptic or seasonally detectable species (such as orchids, some grasses and grass-like herbs).

Family	Scientific Name	Growth Form Group	Common Name	Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6	Plot 7
Amaranthaceae	<i>Alternanthera denticulata</i>	Forb (FG)					0.1			
Amaranthaceae	<i>Alternanthera nana</i>	Forb (FG)	Hairy Joyweed	0.2	0.1	0.1				
Anthericaceae	<i>Caesia parviflora</i>	Forb (FG)	Pale Grass-lily	0.1						
Apiaceae	<i>Centella asiatica</i>	Forb (FG)					0.5	0.1		
Apocynaceae	<i>Parsonsia straminea</i>	Other (OG)	Monkey Rope							
Apocynaceae	<i>Araujia sericifera</i>	High Threat Exotic	Moth Vine					0.1		
Asparagaceae	<i>Asparagus aethiopicus</i>	High Threat Exotic	Ground Asparagus							
Asteraceae	<i>Cotula australis</i>	Forb (FG)	Common Cotula	1		0.2				
Asteraceae	<i>Vernonia cinerea</i> var. <i>cinerea</i>	Forb (FG)		0.2						
Asteraceae	<i>Senecio madagascariensis</i>	High Threat Exotic	Fireweed	3	4	8	10	6	5	4
Asteraceae	<i>Cirsium vulgare</i>	Exotic	Spear Thistle	0.1						
Asteraceae	<i>Bidens pilosa</i>	High Threat Exotic	Cobblers Pegs	25		0.1	0.1	0.1		0.1
Asteraceae	<i>Hypochaeris radicata</i>	Exotic	Catsear	0.2				0.1		
Asteraceae	<i>Erechtites valerianifolius</i>	Exotic	Brazilian Fireweed	1						0.1

Family	Scientific Name	Growth Form Group	Common Name	Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6	Plot 7
Asteraceae	<i>Sonchus oleraceus</i>	Exotic	Common Sowthistle		0.1					
Asteraceae	<i>Ageratum conyzoides</i>	Exotic	Goatweed			0.1				
Asteraceae	<i>Gamochaeta americana</i>	Exotic	Cudweed				0.1	3		
Asteraceae	<i>Soliva sessilis</i>	Exotic	Bindyi					0.1		
Asteraceae	<i>Facelis retusa</i>	Exotic	Annual Trampweed		0.1	0.1				
Bignoniaceae	<i>Pandorea pandorana</i>	Other (OG)	Wonga Vine							
Campanulaceae	<i>Wahlenbergia communis</i>	Forb (FG)						0.1		
Campanulaceae	<i>Wahlenbergia spp.</i>	Forb (FG)	Australian Bluebell		0.1					
Caryophyllaceae	<i>Stellaria media</i>	Exotic	Chickweed	0.1	0.1					
Chenopodiaceae	<i>Chenopodium album</i>	Exotic	Fat Hen			0.1				
Commelinaceae	<i>Commelina cyanea</i>	Forb (FG)	Scurvy Weed	0.5						
Commelinaceae	<i>Murdannia graminea</i>	Forb (FG)	Grass Lily	0.1						
Convolvulaceae	<i>Dichondra repens</i>	Forb (FG)	Kidney Weed	0.1						
Cyperaceae	<i>Cyperus laevis</i>	Grass & grasslike (GG)		0.2						
Cyperaceae	<i>Cyperus sanguinolentus</i>	Grass & grasslike (GG)					0.1	0.1	0.1	5
Cyperaceae	<i>Fimbristylis dichotoma</i>	Grass & grasslike (GG)	Common Fringe-sedge	0.1	5	1	0.5	3	0.5	2
Cyperaceae	<i>Cyperus sesquiflorus</i>	Exotic		0.1	5	10				2
Cyperaceae	<i>Cyperus eragrostis</i>	High Threat Exotic	Umbrella Sedge		10					

Family	Scientific Name	Growth Form Group	Common Name	Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6	Plot 7
Cyperaceae	<i>Cyperus sesquiflorus</i>	Exotic					1	0.1	0.2	
Fabaceae (Faboideae)	<i>Desmodium varians</i>	Other (OG)	Slender Tick-trefoil	0.1						
Fabaceae (Faboideae)	<i>Glycine clandestina</i>	Other (OG)	Love Creeper	0.2						
Fabaceae (Faboideae)	<i>Medicago lupulina</i>	Exotic	Burr Medic	0.1			0.1	1		0.1
Fabaceae (Faboideae)	<i>Trifolium repens</i>	Exotic	White Clover			0.1				
Fabaceae (Mimosoideae)	<i>Acacia implexa</i>	Shrub (SG)	Hickory Wattle	0.1						
Fabaceae (Mimosoideae)	<i>Acacia longifolia</i>	Shrub (SG)	Sydney Golden Wattle							
Geraniaceae	<i>Geranium solanderi</i> var. <i>solanderi</i>	Forb (FG)								0.1
Hypoxidaceae	<i>Hypoxis hygrometrica</i>	Forb (FG)	Golden Weather-grass		0.1					
Juncaceae	<i>Juncus polyanthemus</i>	Grass & grasslike (GG)						0.1		
Juncaceae	<i>Juncus cognatus</i>	Exotic				2	0.2	0.2		0.2
Lamiaceae	<i>Mentha diemenica</i>	Forb (FG)	Slender Mint	0.2						
Lobeliaceae	<i>Lobelia purpurascens</i>	Forb (FG)	Whiteroot	0.5			0.1			
Lomandraceae	<i>Lomandra filiformis</i> subsp. <i>filiformis</i>	Grass & grasslike (GG)	Wattle Mat-rush	0.2						
Lomandraceae	<i>Lomandra longifolia</i>	Grass & grasslike (GG)	Spiny-headed mat-rush							
Lythraceae	<i>Cuphea carthagenesis</i>	Exotic						0.1		
Lythraceae	<i>Lythrum hyssopifolia</i>	Forb (FG)	Hyssop Loosestrife		0.1					
Malvaceae	<i>Sida rhombifolia</i>	Exotic	Paddy's Lucerne	10	0.5	0.5	0.1	0.1	0.1	0.1

Family	Scientific Name	Growth Form Group	Common Name	Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6	Plot 7
Myrtaceae	<i>Corymbia intermedia</i>	Tree (TG)	Pink Bloodwood		5					
Myrtaceae	<i>Corymbia maculata</i>	Tree (TG)	Spotted Gum	25						
Myrtaceae	<i>Eucalyptus siderophloia</i>	Tree (TG)	Grey Ironbark		0.1					
Myrtaceae	<i>Eucalyptus tereticornis</i>	Tree (TG)	Forest Red Gum	10	0.5			10		5
Oleaceae	<i>Notelaea longifolia</i>	Tree (TG)	Large Mock-olive	0.1						
Onagraceae	<i>Ludwigia peploides subsp. montevidensis</i>	Forb (FG)						0.2		
Oxalidaceae	<i>Oxalis corniculata</i>	Exotic		0.2	0.1	0.2	0.1	8		0.1
Phormiaceae	<i>Dianella caerulea var. producta</i>	Forb (FG)	Blue Flax-lily							
Phyllanthaceae	<i>Breynia oblongifolia</i>	Shrub (SG)	Breynia	0.1						
Phyllanthaceae	<i>Phyllanthus virgatus</i>	Forb (FG)		0.1	0.1					
Plantaginaceae	<i>Plantago lanceolata</i>	Exotic	Lamb's Tongues	1		0.1	1	2		0.2
Poaceae	<i>Aristida vagans</i>	Grass & grasslike (GG)	Threeawn Speargrass	5						
Poaceae	<i>Bothriochloa macra</i>	Grass & grasslike (GG)	Red-leg Grass	10	10					
Poaceae	<i>Cymbopogon refractus</i>	Grass & grasslike (GG)		5				0.1		
Poaceae	<i>Cynodon dactylon</i>	Grass & grasslike (GG)	Couch	2	20	50	20	10	15	35
Poaceae	<i>Echinopogon caespitosus</i>	Grass & grasslike (GG)	Hedgehog Grass	2						
Poaceae	<i>Eleusine indica</i>	Exotic	Crowsfoot Grass	0.2		0.1			2	2
Poaceae	<i>Eragrostis brownii</i>	Grass & grasslike (GG)	Brown's Lovegrass		5	0.1			1	0.2

Family	Scientific Name	Growth Form Group	Common Name	Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6	Plot 7
Poaceae	<i>Eragrostis elongata</i>	Grass & grasslike (GG)	Clustered Lovegrass				0.5			
Poaceae	<i>Microlaena stipoides</i>	Grass & grasslike (GG)	Weeping Meadow Grass	8	1					
Poaceae	<i>Panicum effusum</i>	Grass & grasslike (GG)	Hairy Panic		5					
Poaceae	<i>Paspalidium distans</i>	Grass & grasslike (GG)		2						
Poaceae	<i>Paspalum dilatatum</i>	High Threat Exotic	Paspalum		1	1	5	1	8	5
Poaceae	<i>Rytidosperma spp.</i>	Grass & grasslike (GG)	Wallaby Grass	1						
Poaceae	<i>Sporobolus africanus</i>	Exotic	Parramatta Grass	0.1	1	0.5	3	2	2	3
Poaceae	<i>Axonopus fissifolius</i>	High Threat Exotic	Narrow-leafed Carpet Grass		10		30	20	5	
Poaceae	<i>Digitaria sanguinalis</i>	Exotic	Summer Grass	0.2	20	10	5		3	30
Poaceae	<i>Setaria pumila</i>	Exotic	Pale Pigeon Grass	0.5	2	0.1	1	1	30	5
Poaceae	<i>Setaria sphacelata</i>	Exotic	South African Pigeon Grass	0.2	0.2	0.1				0.1
Poaceae	<i>Cenchrus clandestinus</i>	High Threat Exotic	Kikuyu			5	10	40	25	10
Poaceae	<i>Chloris virgata</i>	Exotic	Feathertop Rhodes Grass				0.1	0.1	1	
Polygonaceae	<i>Persicaria hydropiper</i>	Forb (FG)	Water Pepper					0.2		
Portulacaceae	<i>Portulaca oleracea</i>	Forb (FG)	Pigweed	0.1		2	0.1	1		
Primulaceae	<i>Lysimachia arvensis</i>	Exotic	Scarlet Pimpernel					0.1		
Pteridaceae	<i>Cheilanthes sieberi</i>	Fern (EG)	Mulga Fern	0.1	0.1					
Ranunculaceae	<i>Clematis aristata</i>	Other (OG)	Old Man's Beard	0.1						

Family	Scientific Name	Growth Form Group	Common Name	Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6	Plot 7
Rubiaceae	<i>Opercularia diphylla</i>	Forb (FG)		0.1						
Rubiaceae	<i>Pomax umbellata</i>	Forb (FG)	Pomax							
Solanaceae	<i>Solanum nigrum</i>	Exotic	Black-berry Nightshade	0.1		0.1			0.2	
Verbenaceae	<i>Lantana camara</i>	High Threat Exotic	Lantana	3				0.5		
Verbenaceae	<i>Verbena bonariensis</i>	Exotic	Purpletop	0.1		0.1	0.5		8	0.1
Violaceae	<i>Hybanthus stellarioides</i>	Forb (FG)		0.1						
Violaceae	<i>Viola hederacea</i>	Forb (FG)	Ivy-leaved Violet	0.1						
Vitaceae	<i>Cayratia clematidea</i>	Other (OG)	Native Grape	0.2						

Appendix II - Plot Data Summary and Management Zone Scores

Plot Data Summary

Plot	PCT	Condition class	Zone	Easting	Northing	Bearing	Composition - Tree	Composition - Shrub	Composition - Grass	Composition - Forbs	Composition - Ferns	Composition - Other	Structure - Tree	Structure - Shrub	Structure - Grass	Structure - Forbs	Structure - Ferns	Structure - Other	Function – Large Trees	Function – Hollow trees	Function – Litter Cover	Function – Fallen Logs	Function – Trees 5 - 9cm	Function – Trees 10 - 19cm	Function – Trees 20 - 29cm	Function – Trees 30 - 49cm	Function – Trees 50 – 79cm	Function – Tree Regen	Function – HTE
1	3329	Moderate	56	446037	6473374	81	3	2	11	14	1	4	35.1	0.2	35.1	3.4	0.1	0.6	2	0	32	0	0	0	1	1	2	1	31
2	3329	Poor	56	445962	6473411	192	3	0	6	5	1	0	5.6	0	16.6	0.5	0	0	1	0	3.6	0							25
5	3329	Poor	56	445660	6473181	159	1	0	5	5	0	0	10	0	13.3	1.6	0	0	1	0	2.4	0	0	0	1	1	1	1	67.8
3	3329	Low	56	445822	6473119	59	0	0	3	3	0	0	0	0	51.1	2.3	0	0	0	0	0	0							14.1
4	3329	Low	56	445738	6473405	178	0	0	4	4	0	0	0	0	35.1	0.8	0	0	0	0	0	0	0	0	0	0	0	1	55.1
6	3329	Low	56	446022	6473082	170	0	0	4	0	0	0	0	0	46	0	0.1	0	0	0	0	0	1	1	1	1	0	1	43
7	3329	Low	56	446011	6473233	125	1	0	4	1	0	0	5	0	42.2	0.1	0	0	0	0	1.2	0	0	0	0	0	0	1	19.1

Management Zones Scores

Future Composition Condition Scores

Vegetation Zone	Management Zone	Trees	Shrubs	Grasses & grass-like	Forbs	Ferns	Other	Composition Condition Score
PCT 3329 (Moderate)	APZ	2	0	4	3	0	0	13.9
PCT 3329 (Poor)	MZ1 - APZ	2	0	5	5	0	0	24.6
PCT 3329 (Poor)	MZ2 - Direct	0	0	0	0	0	0	0

Future Structure Condition Scores

Vegetation Zone	Management Zone	Trees	Shrubs	Grasses & grass-like	Forbs	Ferns	Other	Structure Condition Score
PCT 3329 (Moderate)	APZ	15	0	32	0.9	0	0	20.4
PCT 3329 (Poor)	MZ1 - APZ	7.8	0	29.7	1.1	0	0	14.3
PCT 3329 (Poor)	MZ2 - Direct	0	0	0	0	0	0	0

Future Function Condition and VIS Scores

Vegetation Zone	Management Zone	Regen stems	Stem Classes	No. of large trees	Hollow-bearing trees	Litter Cover	Coarse Woody Debris	HTE	Function Condition Score	Future VIS	Total Change in VIS
PCT 3329 (Moderate)	APZ	N	2	2	0	0	0	0	38.4	22.1	-41.2
PCT 3329 (Poor)	MZ1 - APZ	N	0.5	1	0	0	0	0	9.7	15	-6.4
PCT 3329 (Poor)	MZ2 - Direct	N	0	0	0	0	0	0	0	0	-21.4

Appendix III - Fauna Species List

Fauna Species List

The following is a list of all fauna species recorded within the site during the survey period.

Observation Type:		
O – Observed	B - Burnt	F - Tracks/scratchings
T - Trapped or netted	H - Hair, feathers, or skin	Y - Bone or teeth
R - Road kill	P - Scat	D - Dog kill
W - Heard call	C - Cat kill	Z - In raptor/owl pellet
V - Fox kill	E - Nest/roost	K - Dead
M - Miscellaneous	X - In scat	U – Bat Recording
WC – Wildlife Cam		

Notes

Threatened species appear in **bold** font.

? – Indicates a species identified without certainty or to a Genus level only.

^^ - Indicates a species observed flying over the site.

* – Indicates an introduced species.

BIRDS

Family Anatidae - Ducks, Swans and Geese

<i>Anas superciliosa</i>	Pacific Black Duck	O
<i>Chenonetta jubata</i>	Australian Wood Duck	O

Family Ardeidae - Herons, Egrets and Bitterns

<i>Ardea ibis</i>	Cattle Egret	O
<i>Egretta novaehollandiae</i>	White-faced Heron	O

Family Threskiornithidae - Ibises and Spoonbills

<i>Threskiornis spinicollis</i>	Straw-necked Ibis	O
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Family Accipitridae - Osprey, Hawks, Eagles and Harriers

<i>Aquila audax</i>	Wedge-tailed Eagle	O
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Family Rallidae - Crakes, Rails and Gallinules

<i>Gallinula tenebrosa</i>	Dusky Moorhen	O
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Family Charadriidae - Plovers, Dotterels and Lapwings

<i>Vanellus miles</i>	Masked Lapwing	O
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Family Columbidae - Pigeons, Doves

<i>Ocyphaps lophotes</i>	Crested Pigeon	O
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Family Halcyonidae - Tree Kingfishers		
<i>Dacelo novaeguineae</i>	Laughing Kookaburra	O
Family Meliphagidae - Honeyeaters		
<i>Manorina melanocephala</i>	Noisy Miner	O
Family Cacatuidae - Cockatoos		
<i>Cacatua galerita</i>	Sulphur-crested Cockatoo	O
<i>Eolophus roseicapillus</i>	Galah	O
Family Psittacidae - Parrots, Rosellas and Lorikeets		
<i>Platycercus eximius</i>	Eastern Rosella	O
<i>Trichoglossus haematodus</i>	Rainbow Lorikeet	O
Family Maluridae - Fairy-Wrens and Emu-Wrens		
<i>Malurus cyaneus</i>	Superb Fairy-Wren	O
Family Dicruridae - Monarchs, Flycatchers, Fantails, Drongo and Magpie-Lark		
<i>Rhipidura leucophrys</i>	Willie Wagtail	O
Family Campephagidae - Cuckoo-shrikes and Trillers		
<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	O
Family Artamidae - Wood-swallows, Butcherbirds, Magpie and Currawongs		
<i>Cracticus tibicen</i>	Australian Magpie	O
<i>Cracticus nigrogularis</i>	Pied Butcherbird	O
<i>Strepera graculina</i>	Pied Currawong	O

AMPHIBIANS

Family Myobatrachidae - 'Southern' Frogs		
<i>Crinia signifera</i>	Common Eastern Froglet	W
Family Hylidae - Tree Frogs		
<i>Litoria fallax</i>	Dwarf Tree Frog	W

MAMMALS

Family Macropodidae - Kangaroos, Wallabies		
<i>Macropus giganteus</i>	Eastern Grey Kangaroo	O

Family Molossidae - Freetail-bats

	<i>Ozimops ridei</i>	Coastal Freetail-bat	U
?	<i>Micronomus norfolkensis</i>	Eastern Freetail-bat	U

Family Vespertilionidae - Plain-nosed Bats

	<i>Chalinolobus gouldi</i>	Gould's Wattled bat	U
	<i>Chalinolobus morio</i>	Chocolate Wattled Bat	U
	<i>Miniopterus australis</i>	Little Bentwing-bat	U
?	<i>Miniopterus orianae oceanensis</i>	Large Bentwing-bat	U
	<i>Myotis adversus</i>	Large-footed Myotis	U
?	<i>Vespadelus darlingtoni</i>	Large Forest Bat	U
?	<i>Vespadelus pumilus</i>	Eastern Forest Bat	U
?	<i>Vespadelus regulus</i>	Southern Forest Bat	U
?	<i>Vespadelus troughtoni</i>	Eastern Cave Bat	U
?	<i>Vespadelus vulturnus</i>	Little Cave Bat	U

Family Equidae

	<i>*Equus caballus</i>	Horse	O
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Appendix IV - Threatened Species Habitat Assessment Table

Likelihood of occurrence criteria

Likelihood	Criteria
Known	The species was observed in the study area during the current survey or has been recorded within the past five years (known from a reputable source).
High	A species is considered highly likely to occur in the study area if: - There are previous credible records on BioNet within the study area from the last 10 years and suitable habitat is present. <u>OR</u> - The species is highly mobile, dependent on identified suitable habitat within the study area (i.e., for breeding or important life cycle periods such as winter flowering resources) and has been recorded recently (within five years) on BioNet in the locality. This also includes species known or likely to visit the study area during regular seasonal movements or migration.
Moderate	A species is considered moderately likely to occur in the study area if: - Any suitable habitat (e.g., foraging) is present in the study area, the species is highly mobile and has been recorded in the locality in the last 10 years on BioNet. The species may be unlikely to maintain sedentary populations; however, may seasonally use resources within the study area opportunistically or during migration. The species is unlikely to be dependent (i.e., for breeding or important life cycle periods such as winter flowering resources) on habitat within the study area. <u>OR</u> - The species is not highly-mobile, dependent on identified suitable habitat features (e.g., hollows, rocky outcrops) within the study area and has been recorded in the locality in the last 10 years on BioNet. <u>OR</u> - For flora species identified by the BAM-C or recorded in the locality in the last 10 years on BioNet – the associated PCT/habitat present in the study area is not degraded and the species was not targeted by surveys in accordance with the BAM and relevant survey guidelines. In addition, for flora species known to occur in disturbed areas (e.g., orchids), records from any time within the locality may warrant inclusion in this category.
Low	A species is considered to have a low likelihood of occurring in the study area if: - For highly mobile species, the species may be an occasional visitor, but habitat similar to the study area is widely distributed in the locality, meaning that the species is not dependent (i.e., for breeding or important life cycle periods such as winter flowering resources) on habitats in the study area and the species has not been recorded in the locality in the last 10 years on BioNet. <u>OR</u> - The species is not highly-mobile, dependent on identified suitable habitat features (e.g., hollows, rocky outcrops) within the study area and has not been recorded in the locality in the last 10 years on BioNet. <u>OR</u> - For flora species identified by the BAM-C, suitable associated habitat (see the TBDC) is present in the study area and the species was not identified following targeted surveys in accordance with the BAM and relevant survey guidelines. For flora species not identified by the BAM-C, though have been recorded in the locality on BioNet at any time, the associated suitable habitat (see the TBDC) is not present in the study area though similar habitats of the same vegetation formation is present in the study area.
Unlikely	Suitable habitat for the species is absent from the study area.

Threatened species habitat assessment table

Scientific Name	Common Name	BC Act	EPBC Act	Habitat Description and Locally Known Populations	BioNet Records	EPBC Act Protected Matters Report ²	BAM-C ³	Credit Type	Potential SAI	Likelihood of occurrence	Justification
Flora											
<i>Cynanchum elegans</i>	White-flowered PlantWax	E	E	Restricted to eastern NSW where it is distributed from Brunswick Heads on the north coast to Gerroa in the Illawarra region. The species has been recorded as far west as Merriwa in the upper Hunter River valley. Usually occurs on the edge of dry rainforest vegetation. Other associated vegetation types include littoral rainforest; coastal scrub; <i>Eucalyptus tereticornis</i> aligned open forest and woodland; Spotted Gum aligned open forest and woodland; and Bracelet Honey myrtle scrub to open scrub.	4	Habitat known to occur within area.	No	Species	No	Low	Marginal habitat is available within the proposal area. No individuals were identified during site surveys.
<i>Marsdenia longiloba</i>	Clear Milkvine	E	V	Occurs on the northern NSW coast from Barrington Tops. The species typically occurs in subtropical and warm temperate rainforest, lowland moist or open eucalypt forest adjoining rainforest and occasionally in rocky outcrops.	0	Habitat may occur within area	No	Species	No	Unlikely	The species is unlikely to occur on site given the disturbed nature of the site and absence of preferred habitat. This species has not been recorded locally.
<i>Parsonsia dorrigoensis</i>	Milky Silkpod	V	E	Milky Silkpod is found only within NSW, with scattered populations in the north coast region between Kendall and Woolgoolga. Found in subtropical and warm-temperature rainforest, on rainforest margins, and in moist eucalypt forest up to 800 m, on brown clay soils.	0	Habitat may occur within area.	No	Species	Now	Unlikely	The species is unlikely to occur on site given the disturbed nature of the site and absence of preferred habitat. This species has not been recorded locally.
<i>Tylophora woollsii</i>	Cryptic Forest Twiner	E	E	This species is distributed from the NSW north coast and New England Tablelands to southern Queensland. Known to occur on the Tablelands from the Back Rock and Boonoo Boonoo areas north of Tenterfield. Habitat preference includes: moist eucalypt forest, moist sites in dry eucalypt forest and rainforest margins. Cryptic Forest Twiner flowers in summer and autumn, usually between January and March, but sometimes as late as November. Plants appear to persist as a network of stems under leaf litter when aerial stems are present.	0	Habitat likely to occur within area	No	Species	No	Low	Marginal habitat may be available within the subject site. The species was not observed during targeted surveys.
<i>Senna acclinis</i>	Rainforest Cassia	E	-	Occurs in coastal districts and adjacent tablelands of NSW from the Illawarra in NSW to Queensland. Grows on the margins of subtropical, littoral and dry rainforests.	1	N/A	No	Species	No	Unlikely	Preferred habitat is absent. The species was not observed during targeted surveys.
<i>Maundia triglochinosides</i>	-	V	-	Restricted to coastal NSW and extending into southern Queensland. The current southern limit is Wyong; former sites around Sydney are now extinct. Associated with wetland species this plant grows in swamps, lagoons, dams, channels, creeks, or shallow freshwater 30 - 60 cm deep on heavy clay with low nutrients.	1	N/A	No	Species	No	Unlikely	No specimens were identified during site surveys. Broadly, the dams and drainage line may provide marginal habitat for this species although connectivity to potential source populations is absent.
<i>Eucalyptus glaucina</i>	Slaty Red Gum	V	V	Found only on the north coast of NSW and in separate districts (Casino, and from Taree to Broke, west of Maitland), the species grows in grassy woodlands as well as dry eucalypt forest. It is found on deep and moderately fertile soils that are well-watered.	9	Habitat may occur within area.	No	Species	No	Low	Potential habitat is available within the proposal area. No individuals were identified during site surveys.
<i>Eucalyptus largeana</i>	Craven Grey Box	E	E	Confined to Gloucester-Craven district and near Pokolbin, although a number of unsubstantiated records exist from	0	Habitat may occur within area	No	Species	No	Unlikely	This species is unlikely to occur given the sites' proximity to known populations. No

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				outside the currently accepted range. Populations are known from Copeland Tops State Conservation Area and Berrico Nature Reserve, with unconfirmed cases from Talawahl and Glen Nature Reserves and Willi Willi National Park. Often found in wet forest on subcoastal ranges.							individuals were identified during site surveys.
<i>Eucalyptus seeana</i>	Narrow-leaved Red Gum population in the former Greater Taree LGA	E2	-	The species has a distribution from the north coast of NSW to south east Queensland. The endangered population within the Greater Taree LGA is at or near the southern-most occurrence. A small part of the population occurs within Brimbin Natura Reserve and in a Council reserve. Occurs as scattered individuals in woodlands and open forests on low, often swampy, sandy soils.	497	N/A	Yes	Species	No	Low	Potential habitat is available within the proposal area. No individuals were identified during site surveys.
<i>Melaleuca biconvexa</i>	Biconvex Paperbark	V	V	Biconvex Paperbark is only found in NSW, with scattered and dispersed populations found in the Jervis Bay area in the south and the Gosford-Wyong area in the north. Generally, grows in damp places, often near streams or low-lying areas on alluvial soils of low slopes or sheltered aspects.	0	Habitat may occur within area.	No	Species	No	Unlikely	Suitable habitat is absent from the proposal area.
<i>Rhodamnia rubescens</i>	Scrub Turpentine	CE	CE	Known to occur in coastal districts north from Batemans Bay in NSW to areas inland of Bundaberg in Queensland. Grows in coastal rainforests, wet sclerophyll associations in rainforest transition zones and creek-side riparian vegetation. Severely threatened by infection from the exotic rust fungus <i>Austropuccinia psidii</i> (Myrtle Rust).	22	Habitat known to occur within area.	Yes	Species	Yes	Unlikely	Suitable habitat is absent from the proposal area.
<i>Rhodomyrtus psidioides</i>	Native Guava	CE	CE	Occurs from Broken Bay to Maryborough in Queensland. Typically restricted to coastal and sub-coastal areas of low elevation, however the species does occur up to 120km inland in the Hunter and Clarence River catchments. Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest often near creeks and drainage lines. Extremely susceptible to Myrtle Rust.	4	Habitat known to occur within area.	Yes	Species	Yes	Unlikely	Suitable habitat is absent from the proposal area.
<i>Syzygium paniculatum</i>	Magenta Lilly Pilly	E	V	Found only in NSW, the Magenta Lilly Pilly occurs from Upper Lansdowne to Conjola State Forest. It occurs on gravels, sands, silts and clays in riverside gallery rainforests and remnant littoral rainforest communities.	0	Habitat known to occur within area.	No	Species	No	Unlikely	Suitable habitat is absent from the proposal area.
<i>Cryptostylis hunteriana</i>	Leafless Tongue-orchid	V	V	Does not appear to have well defined habitat preferences and is known from a range of communities, including swamp-heath and woodland. The larger populations typically occur in woodland dominated by Scribbly Gum (<i>Eucalyptus sclerophylla</i>), Silvertop Ash (<i>E. sieberi</i>), Red Bloodwood (<i>Corymbia gummifera</i>) and Black Sheoak (<i>Allocasuarina littoralis</i>) often in association with the Large Tongue Orchid (<i>C. subulata</i>) and the Tartan Tongue Orchid (<i>C. erecta</i>).	0	Habitat may occur within area.	No	Species	No	Unlikely	This species is unlikely to occur due to the disturbed nature of the proposal area, the sites' proximity to known populations and lack of associated vegetation types.
<i>Diuris flavescens</i>	Pale Yellow Doubletail	CE	CE	Known only from the Wingham-Tinonee - Burrell Creek area, incl. Kiwarrak State Forest; on the mid-north coast of New South Wales. Endemic to this area. Grows in grassy	122	Habitat known to occur within area	No	Species	Yes	Unlikely	This species is unlikely to occur due to the disturbed nature of the proposal area, the sites' proximity to known populations and lack of associated vegetation types.

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				tall eucalypt forest with Kangaroo Grass and Blady Grass on brown clay soil.							Targeted surveys for this species were completed in early October 2020. Targeted surveys for <i>Pterostylis chaetophora</i> were also completed in late October 2023 which overlaps with the flowering period for this species, albeit at the end of the listed flowering period. The survey confirmed the groundcover was in poor condition with high weed cover and habitat suitable for this species is absent.
<i>Genoplesium littorale</i>	Tuncurry Midge Orchid	CE	CE	The Tuncurry Midge Orchid is only known to inhabit a small area in the Great Lakes Local Government Area just north of Tuncurry on the NSW mid-north coast. The species grows in coastal heath close to the ocean in deep, well-drained sandy soils. Associated vegetation includes: <i>Leptospermum laevigatum</i> , <i>Monotoca elliptica</i> , <i>Ochrosperma lineare</i> and <i>Banksia spp.</i> Lichens and various graminoides are often present alongside the orchids.	928	N/A	No	Species	Yes	Unlikely	This species is unlikely to occur due to the disturbed nature of the proposal area, the sites' proximity to known populations and lack of associated vegetation types.
<i>Phaius australis</i>	Lesser Swamp-orchid	E	E	Grows in swampy grassland or swampy forest including rainforest, eucalypt or paperbark forest, mostly in coastal areas. Occurs in Queensland and north-east NSW as far south as Coffs Harbour. Historically, it extended further south, to Port Macquarie.	0	Habitat may occur within area.	No	Species	No	Unlikely	Suitable habitat is absent from the proposal area.
<i>Pterostylis chaetophora</i>	-	V	-	In NSW it is currently known from 18 scattered locations in a relatively small area between Taree and Kurri Kurri, extending to the south-east towards Tea Gardens and west into the Upper Hunter, with additional records near Denman and Wingen. The preferred habitat is seasonally moist, dry sclerophyll forest with a grass and shrub understorey.	6	N/A	No	Species	No	Unlikely	This species is unlikely to occur due to the disturbed nature of the proposal area. No specimens were observed during targeted surveys during the known flowering period of this species (September – October).
<i>Rhizanthella slateri</i>	Eastern Underground Orchid	V	E	The species occurs from south-east Queensland to south-east NSW. In the Great Lakes LGA, a large population has been identified near Bulahdelah. Apparently prefers sclerophyll forest with a reasonably deep layer of leaf litter, although little else is known about habitat preferences.	0	Habitat may occur within area.	No	Species	Yes	Unlikely	This species is unlikely to occur due to the disturbed nature of the proposal area.
<i>Euphrasia arguta</i>	-	CE	CE	Rediscovered in the Nundle area of the NSW north-western slopes and tablelands in 2008. Prior to this, it had not been collected for 100 years. Plants from the Nundle area have been reported from eucalypt forest with a mixed grass and shrub understorey. Here, plants were most dense in an open disturbed area and along the roadside, indicating the species had regenerated following disturbance.	0	Habitat may occur within area.	No	Species	Yes	Unlikely	Suitable habitat is absent from the proposal area.
<i>Arthraxon hispidus</i>	Hairy-joint Grass	V	V	Occurs over a wide area in south-east Queensland, and on the northern tablelands and north coast of NSW but is never common. Moisture and shade-loving, often found in or on the edges of rainforest and in wet eucalyptus forest, often near creeks or swamps.	0	Habitat likely to occur within area.	No	Species	No	Low	Marginal habitat is available within the proposal area. No individuals were identified during site surveys.

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<i>Persicaria elatior</i>	Tall Knotweed	V	V	Tall Knotweed has been recorded in south-eastern NSW, Moruya State Forest, the Upper Avon River catchment and Picton Lakes. In northern NSW it is known from Raymond Terrace and the Grafton area. The species usually occurs in damp places, particularly beside streams and lakes. It also occasionally occurs in swamp forest and is sometimes associated with disturbance.	0	Habitat may occur within area.	No	Species	No	Low	The dams and drainage line provide marginal habitat for this species. No specimens were identified during site surveys.
<i>Macadamia integrifolia</i>	Macadamia Nut	-	V	Occurs from Mt Bauple, near Gympie, to Currumbin Valley in the Gold Coast hinterland, south-east Queensland. Many records, particularly those further south, are thought to be propagated. Found in subtropical rainforest.	0	Habitat known to occur within area.	No	Species	No	Unlikely	Suitable habitat is absent from the proposal area.
<i>Asperula asthenes</i>	Trailing Woodruff	V	V	Occurs in damp sites, often along riverbanks. It is found in scattered locations from Bulahdelah north to near Kempsey, with several records from the Port Stephens/Wallis Lakes area.	31	Habitat known to occur within area.	No	Species	No	Low	Marginal habitat is available along the drainage line in the west of the proposal area. No individuals were identified during site surveys.
<i>Thesium australe</i>	Austral Toadflax	V	V	Found in very small populations scattered across eastern NSW, along the coast, and from the Northern to Southern Tablelands. Occurs in grassland on coastal headlands or grassland and grassy woodland away from the coast. A root parasite that takes water and some nutrients from other plants, especially Kangaroo Grass.	0	Habitat likely to occur within area.	No	Species	No	Unlikely	Suitable habitat is absent from the proposal area.
<i>Solanum sulphureum</i>	Manning Solanum Yellow	E	E	Restricted to the Taree – Wingham area on the mid-north coast of NSW. Records indicate two locations near Mooral Creek and within Kiwarra State Forest. Other known locations include Marlee and Killawarra in Greater Taree LGA. Also predicted to occur in Bellangry State Forest in Port Macquarie-Hastings LGA. Inhabits sunlit breaks in rainforest, rainforest regrowth on pastureland or eucalypt forest with rainforest understorey. Grows on shallow or deep loams or clay loams.	55	Habitat known to occur within area.	No	Species	Yes	Unlikely	Suitable habitat is absent from the proposal area.
Frogs											
<i>Litoria aurea</i>	Green and Golden Bell Frog	E	V	Formerly distributed along the NSW coast. Since 1990, there have been approximately 50 recorded locations in NSW, most of which are small, coastal, or near coastal populations. Large populations in NSW are located around the metropolitan areas of Sydney, Shoalhaven and mid-north coast (one an island population). There is only one known population on the NSW Southern Tablelands. Inhabits marshes, dams and stream-sides, particularly those containing bullrushes (<i>Typha</i> spp.) or spike rushes (<i>Eleocharis</i> spp.).	3	Habitat likely to occur within area.	No	Species	No	Unlikely	The dams on site are isolated from suitable habitat or known populations, lack emergent vegetation and the surrounding habitat is too degraded to support this species.
<i>Mixophyes balbus</i>	Stuttering Frog	E	V	Found in rainforest and wet, tall open forest in the foothills and escarpment on the eastern side of the Great Dividing Range. Outside the breeding season adults live in deep leaf litter and thick understorey vegetation on the forest floor.	0	Habitat likely to occur within area.	Yes	Species	No	Unlikely	This species is unlikely to occur given the absence of suitable waterbodies and habitats.
<i>Mixophyes iteratus</i>	Giant Barred Frog	E	V	Distributed along the coast and ranges from Eumundi in south-east Queensland to Warrimoo in the Blue Mountains. Declines appear to have occurred at the	0	Habitat may occur within area.	Yes	Species	No	Unlikely	This species is unlikely to occur given the absence of suitable waterbodies and habitats.

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				margins of the species' range, with no recent records south of the Hawkesbury River and disappearances from a number of streams in QLD. Northern NSW, particularly the Coffs Harbour-Dorrigo area, is a stronghold. Found along freshwater streams with permanent or semi-permanent water, generally (but not always) at lower elevation. Riparian habitats such as rainforest or wet sclerophyll forest area favoured, but the species may also occur in other riparian habitats such as in drier forest, degraded riparian remnants, and even occasionally around dams. Breeding takes place from late spring to summer.							
Birds											
<i>Chthonicola sagittata</i>	Speckled Warbler	V	-	The species has a patchy distribution throughout south-eastern Queensland, eastern NSW and into Victoria, as far west as the Grampians. Most frequently reported from the hills and tablelands of the Great Dividing Range, and rarely from the coast. Lives in a wide range of Eucalyptus dominated communities that have a grassy understorey, often on rocky ridges or in gullies. Typical habitats include scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy. Large, relatively undisturbed remnants are required for the species to persist in an area.	1	N/A	Yes	Ecosystem	No	Low	Associated with PCT 3329. Marginal habitat is available within the remnant vegetation on site.
<i>Circus assimilis</i>	Spotted Harrier	V	-	The Spotted Harrier occurs throughout the Australian mainland, except in densely forested or wooded habitats of the coast, escarpment and ranges, and rarely occurs in Tasmania. The species typically occurs in grassy open woodland including Acacia and mallee remnants, inland riparian woodland, grassland and shrub steppe. Most commonly found in native grassland but may also occur in agricultural land.	3	N/A	Yes	Ecosystem	No	Low	Associated with PCT 3329. May rarely hunt or rest within the subject site. No raptor nests were observed within the site. The species was not observed during targeted surveys.
<i>Erythrorichis radiatus</i>	Red Goshawk	CE	E	Inhabit open woodland and forest, preferring a mosaic of vegetation types, a large population of birds as a source of food, and permanent water, and are often found in riparian habitats along or near watercourses or wetlands. In NSW, preferred habitats include mixed subtropical rainforest, <i>Melaleuca</i> swamp forest and riparian <i>Eucalyptus</i> forest of coastal rivers.	0	Habitat may occur within area.	No	Species	Yes	Low	May rarely hunt or rest within the subject site. No raptor nests were observed within the site. This species has not been recorded within the local area.
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	V	-	Distributed around the Australian coastline. Habitats are characterised by the presence of large areas of open water including larger rivers, swamps, lakes, and the sea. Occurs at sites near the sea or sea-shore, such as around bays and inlets, beaches, reefs, lagoons, estuaries and mangroves; and at or in the vicinity of freshwater swamps, lakes, reservoirs, billabongs and saltmarsh. Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, and forest (including rainforest).	16	N/A	Yes	Dual Credit Species	No	Low	Suitable hunting habitat is largely absent from the proposal; however, some marginal habitat is available within the larger dam occurring in the north of the site. Raptor nests indicative of historical breeding were not recorded within the proposal area. Retained as an ecosystem credit species given the proximity of the site to suitable hunting habitat.

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<i>Hieraaetus morphnoides</i>	Little Eagle	V	-	Occupies open eucalypt forest, woodland, or open woodland. Sheoak or acacia woodlands and riparian woodlands of interior NSW are also used.	2	N/A	Yes	Dual Credit Species	No	Moderate	Large stick nests, indicative of historical breeding, were not recorded within the proposal area. Retained as an ecosystem credit species given the presence of suitable hunting habitat.
<i>Lophoictinia isura</i>	Square-tailed Kite	V	-	Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses.	18	N/A	Yes	Dual Credit Species	No	Moderate	Large stick nests, indicative of historical breeding, were not recorded within the proposal area. Retained as an ecosystem credit species given the presence of suitable hunting habitat.
<i>Pandion cristatus</i>	Eastern Osprey	V	-	Open and swamp forest adjacent to the coast or estuaries, fishing mainly in brackish or saltwater. Breed from July to September in NSW. Nests are made high up in dead trees or in dead crowns of live trees, usually within one kilometre of the sea.	18	N/A	Yes	Dual Credit Species	No	Unlikely	Associated with PCT 3329. Preferred habitat is absent from the proposal area.
<i>Anseranas semipalmata</i>	Magpie Goose	V	-	Since the 1980s there have been an increasing number of records in central and northern NSW. Vagrants can follow food sources to south-eastern NSW. Mainly found in shallow wetlands (less than 1 m deep) with dense growth of rushes or sedges.	1	N/A	No	Ecosystem	No	Low	Marginal habitat is available within the dams on site.
<i>Hirundapus caudacutus</i>	White-throated Needletail	P	V	The White-throated Needletail is distributed throughout all coastal regions of Queensland and NSW, extending inland to the western slopes of the Great Dividing Range and occasionally onto the adjacent inland plains. The species is almost exclusively aerial, from heights of less than 1m up to more than 1000m above the ground. Although they are recorded to occur in a broad range of habitat, the species is most often recorded above open forest, rainforest and heathland and may also fly between trees or in clearings but are less commonly recorded above woodland and treeless areas. In coastal areas they have been recorded above sandy beaches, mudflats and around coastal cliffs, ridges, and sand-dunes. Breeding habitat consists of wooded lowlands and sparsely vegetated hills, as well as mountains covered with coniferous forests.	11	Habitat known to occur within area.	Yes	Ecosystem	No	Moderate	Associated with PCT 3329. Aerial species that may forage within the airspace above the proposal area. No breeding habitat is likely to occur within the proposal area.
<i>Botaurus poiciloptilus</i>	Australasian Bittern	E	E	Lives alone or in loose groups and favours permanent fresh waters dominated by sedges, rushes, reeds or cutting grasses (e.g., Phragmites, Scirpus, Eleocharis, Juncus, Typha, Baumea and Gahnia sp.).	2	Habitat known to occur within area.	No	Ecosystem	No	Unlikely	Suitable habitat is absent from the proposal area.
<i>Ixobrychus flavicollis</i>	Black Bittern	V	-	The Black Bittern has a wide distribution, from southern NSW north to Cape York, along the north coast to the Kimberley region and in the south-west of Western Australia. Inhabits terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation. Where permanent water is present, the species may occur in flooded grassland, forest, woodland, rainforest, and mangroves.	1	N/A	No	Ecosystem	No	Unlikely	Suitable habitat is absent from the proposal area.

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<i>Artamus cyanopterus cyanopterus</i>	Dusky Woodswallow	V	-	In New South Wales, this species is widespread from coast to inland, including the western slopes of the Great Dividing Range and farther west. It is sparsely scattered in, or largely absent from, much of the Upper Western region. Inhabits woodlands and dry open sclerophyll forests, usually dominated by eucalypts, including mallee associations. It has also been recorded in shrublands and heathlands and various modified habitats, including regenerating forests, very occasionally in moist forests or rainforests. Generally, the understorey is open with sparse eucalypt saplings, acacias and other shrubs, including heath.	2	N/A	Yes	Ecosystem	No	Moderate	Associated with PCT 3329. Marginal habitat is available within the remnant vegetation on site.
<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	V	E	Distributed from southern Victoria through south- and central-eastern New South Wales. In New South Wales, the Gang-gang Cockatoo is distributed from the south-east coast to the Hunter region, and inland to the Central Tablelands and south-west slopes. It occurs regularly in the Australian Capital Territory. It is rare at the extremities of its range, with isolated records known from as far north as Coffs Harbour and as far west as Mudgee. In spring and summer, generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In autumn and winter, the species often moves to lower altitudes in drier, more open eucalypt forests and woodlands, particularly box-gum and box-ironbark assemblages, or in dry forest in coastal areas and often found in urban areas. Favours old growth forest and woodland attributes for nesting and roosting. Nests are located in hollows that are 10 cm in diameter or larger in eucalypt.	0	Habitat may occur within area.	Yes	Species	No	Low	This species is unlikely to breed within the proposal area given the paucity of local records.
<i>Calyptrorhynchus lathamii lathamii</i>	Glossy Black-Cockatoo	V	V	Inhabits open forest and woodlands of the coast and the Great Dividing Range up to 1000m in which stands of She-oak species, particularly Black She-oak (<i>Allocasuarina littoralis</i>), Forest She-oak (<i>A. torulosa</i>) or Drooping She-oak (<i>A. verticillata</i>) occur.	91	N/A	Yes	Dual Credit Species	No	Low	Associated with PCT 3329. No trees with hollows suitable for breeding occur within the site. Remnant trees may provide some marginal / non-preferred foraging habitat.
<i>Coracina lineata</i>	Barred Cuckoo-shrike	V	-	Coastal eastern Australia from Cape York to the Manning River in NSW. Barred Cuckoo-shrikes are generally uncommon in their range, and are rare in NSW. Rainforest, eucalypt forests and woodlands, clearings in secondary growth, swamp woodlands and timber along watercourses.	0	N/A	Yes	Ecosystem	No	Low	Associated with PCT 3329. Marginal habitat is available within the proposal area.
<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	E	-	Widespread in coastal and subcoastal northern and eastern Australia, as far south as central NSW (although vagrants may occur further south or inland, well away from breeding areas). In NSW, the species becomes increasingly uncommon south of the Clarence Valley, and rarely occurs south of Sydney. Floodplain wetlands (swamps, billabongs, watercourses and dams) of the major coastal rivers are the key habitat in NSW for the	24	N/A	No	Ecosystem	No	Low	Associated with PCT 3329. May rarely forage within the dams present on site

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				Black-necked Stork. Secondary habitat includes minor floodplains, coastal sandplain wetlands and estuaries.							
<i>Climacteris picumnus victoriae</i>	Brown Treecreeper	V	V	The Brown Treecreeper is endemic to eastern Australia and occurs in eucalypt forests and woodlands of inland plains and slopes of the Great Dividing Range. It is less commonly found on coastal plains and ranges. Mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and River Red Gum (<i>Eucalyptus camaldulensis</i>) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses; usually not found in woodlands with a dense shrub layer; fallen timber is an important habitat component for foraging; also recorded, though less commonly, in similar woodland habitats on the coastal ranges and plains.	0	N/A	Yes	Ecosystem	No	Low	Associated with PCT 3329. Marginal foraging habitat is available within the remnant vegetation on site. Hollows suitable for nesting are absent.
<i>Ptilinopus magnificus</i>	Wompoo Fruit-Dove	V	-	This species occurs along the coast and coastal ranges from the Hunter River in NSW to Cape York Peninsula, but it is rarely found south of Coffs Harbour. Habitat occurs in or near rainforest, low elevation moist eucalypt forest and brush box forests. Most often seen in mature forests, but also found in remnant and regenerating rainforest.	8	N/A	Yes	Ecosystem	No	Low	Associated with PCT 3329. Habitat is considered marginal given the disturbed nature of the site and paucity of preferred food trees.
<i>Stagonopleura guttata</i>	Diamond Firetail	V	V	The Diamond Firetail is endemic to south-eastern Australia, extending from central Queensland to the Eyre Peninsula in South Australia. It is widely distributed in NSW. Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum <i>Eucalyptus pauciflora</i> Woodlands. Also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities.	0	Habitat likely to occur within area.	Yes	Ecosystem	No	Low	Associated with PCT 3329. Habitat is considered marginal given the disturbed nature of the site.
<i>Falco hypoleucos</i>	Grey Falcon	V	V	The Grey Falcon is a rarely sighted species with a broad distribution, spanning much of Australia. Although occasionally found in open woodlands near the coast, the species predominantly inhabits shrubland, grassland and wooded watercourses of arid and semi-arid regions.	0	Habitat may occur within area.	No	Ecosystem	No	Unlikely	This species does not typically occur within coastal habitats and would only be a rare vagrant visitor.
<i>Haematopus longirostris</i>	Pied Oystercatcher	E	-	The species is distributed around the entire Australian coastline, although it is most common in coastal Tasmania and parts of Victoria, such as Corner Inlet. Favours intertidal flats of inlets and bays, open beaches, and sandbanks. Nests mostly on coastal or estuarine beaches although occasionally they use saltmarsh or grassy areas.	1	N/A	No	Species	No	Unlikely	Preferred habitat is absent.
<i>Irediparra gallinacea</i>	Comb-crested Jacana	V	-	Occurs on freshwater wetlands in northern and eastern Australia, mainly in coastal and subcoastal regions, from the north-eastern Kimberley Division of Western Australia to Cape York Peninsula then south along the east coast to the Hunter region of NSW, with some recorded in south-eastern NSW. Inhabit permanent freshwater wetlands, either still or slow flowing, with a good surface cover of	3	N/A	No	Ecosystem	No	Unlikely	Preferred habitat is absent.

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				floating vegetation, especially waterlilies, or fringing and aquatic vegetation.							
<i>Anthochaera phrygia</i>	Regent Honeyeater	CE	CE	Inhabits eucalypt open forests and woodlands, predominantly box-ironbark types, but also Spotted Gum and Swamp Mahogany on the coast. The species also inhabits River She-oak gallery forest with <i>Amyema cambagei</i> (Needle-leaf Mistletoe). There are only three known key breeding regions remaining: north-east Victoria (Chiltern-Albury), and in NSW at Capertee Valley and the Bundarra-Barraba region.	2	Foraging, feeding or related behaviour likely to occur within area.	No	Dual Credit Species	Yes	Low	Associated with PCT 3329. The proposal area is not located within an area mapped as important habitat for this species. The trees on site may provide some marginal seasonal foraging habitat.
<i>Grantiella picta</i>	Painted Honeyeater	V	V	The Painted Honeyeater is a nomadic species but occurs mostly on the inland slopes of the Great Dividing Range in NSW, Victoria, and southern Queensland. The species habitat includes Boree/Weeping Myall (<i>Acacia pendula</i>), Brigalow (<i>A. harpophylla</i>), Box-Gum Woodlands and Box-Ironbark Forests. The species preferentially feeds on <i>Amyema</i> genus mistletoes and insects.	0	Habitat likely to occur within area.	No	Ecosystem	No	Unlikely	This species does not typically occur within coastal habitats and would only be a rare vagrant visitor.
<i>Melithreptus gularis</i>	Black-chinned Honeyeater	V	-	Extends south from central Queensland, through NSW, Victoria into south eastern South Australia. In NSW it is widespread, with records from the tablelands and western slopes of the Great Dividing Range to the north-west and central-west plains and the Riverina. It is rarely recorded east of the Great Dividing Range, although regularly observed from the Richmond and Clarence River areas. Occupies mostly upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts, especially Mugga Ironbark (<i>Eucalyptus sideroxylon</i>), White Box (<i>E. albens</i>), Inland Grey Box (<i>E. microcarpa</i>), Yellow Box (<i>E. melliodora</i>), Blakely's Red Gum (<i>E. blakelyi</i>) and Forest Red Gum (<i>E. tereticornis</i>). Also inhabits open forests of smooth-barked gums, stringybarks, ironbark's, river Sheoak (nesting habitat) and tea-trees.	0	N/A	Yes	Ecosystem	No	Unlikely	Associated with PCT 3329. This species does not typically occur within coastal habitats in the local area and would only be a rare vagrant visitor.
<i>Daphoenositta chrysoptera</i>	Varied Sittella	V	-	Inhabits eucalypt forests and woodlands, especially rough-barked species and mature smooth-barked gums with dead branches, mallee, and Acacia woodland. Feeds on arthropods gleaned from crevices in rough or decorticating bark, dead branches, standing dead trees, and from small branches and twigs in the tree canopy.	12	N/A	Yes	Ecosystem	No	Moderate	Associated with PCT 3329. Marginal habitat is available within the proposal area. No specimens or characteristic nests were observed during site surveys.
<i>Melanodryas cucullata</i>	South-eastern Hooded Robin	V	E	The Hooded Robin is widespread, found across Australia, except for the driest deserts and the wetter coastal areas - northern and eastern coastal Queensland and Tasmania. Prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas.	0	Habitat may occur within area.		Ecosystem	No	Low	Habitat is considered marginal given the disturbed nature of the site.
<i>Petroica boodang</i>	Scarlet Robin	V	-	The Scarlet Robin is found from south east Queensland to south east South Australia and also in Tasmania and south west Western Australia. In NSW, it occurs from the coast to the inland slopes. Lives in dry eucalypt forests and	0	N/A	Yes	Ecosystem	No	Low	Associated with PCT 3329. Marginal habitat is available within the proposal area.

Scientific Name	Common Name	BC Act	EPBC Act	Habitat Description and Locally Known Populations	BioNet Records	EPBC Act Protected Matters Report ²	BAM-C ³	Credit Type	Potential SAI	Likelihood of occurrence	Justification
				woodlands. The understorey is usually open and grassy with few scattered shrubs.							
<i>Glossopsitta pusilla</i>	Little Lorikeet	V	-	Forages primarily in the canopy of open Eucalypt Forest and woodland, yet also forages on Angophoras, Melaleucas and other tree species. Riparian habitats are often utilised. Isolated flowering trees in open country, e.g., paddocks, roadside remnants and urban trees, also help sustain viable populations of the species.	9	N/A	Yes	Ecosystem	No	Moderate	Associated with PCT 3329. The remnant vegetation on site may provide suitable foraging habitat. Nesting habitat is absent.
<i>Lathamus discolor</i>	Swift Parrot	E	CE	Migrates to the Australian south-east mainland between March and October. Generally, occur in areas where eucalypts are flowering profusely or where there are abundant lerp infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany, Spotted Gum, Red Bloodwood, Mugga Ironbark and White Box.	2	Habitat known to occur with area.	Yes	Dual Credit Species	Yes	Low	Associated with PCT 3329. The proposal area is not located within an area mapped as important habitat for this species. The trees on site may provide some marginal seasonal foraging habitat.
<i>Neophema chrysostoma</i>	Blue-winged Parrot	V	V	The main populations of Blue-winged Parrots are in Tasmania and Victoria, particularly in southern Victoria and the midlands and eastern areas of Tasmania. Sparser populations are found in western New South Wales and eastern South Australia, extending to south-west Queensland and occasionally into the Northern Territory. The Blue-winged Parrot inhabits a range of habitats from coastal, sub-coastal and inland areas, right through to semi-arid zones. Throughout their range they favour grasslands and grassy woodlands. They are often found near wetlands both near the coast and in semi-arid zones. Blue-winged Parrots can also be seen in altered environments such as airfields, golf-courses and paddocks.	0	Habitat may occur within area	No	-	No	Low	This species is unlikely to breed within the proposal area given the paucity of local records. The species was not observed during targeted surveys.
<i>Rostratula australis</i>	Australian Snipe Painted	E	E	Most records are from the southeast, particularly the Murray Darling Basin, but also wetlands on the Hawkesbury River and the Clarence and lower Hunter Valleys. Prefers fringes of swamps, dams, and nearby marshy areas where there is a cover of grasses, lignum, low scrub, or open timber.	0	Habitat likely to occur within area.	No	Ecosystem	No	Low	Suitable habitat is absent from the proposal area. No specimens were observed during site surveys.
<i>Calidris canutus</i>	Red Knot	-	E	The migratory species arrives between September and October to occupy major river estuaries and sheltered embayment's of the NSW coastline, in particular Hunter River estuary. Predominantly occurs in small numbers on intertidal mudflats, estuaries, bays, inlets, lagoons, harbours and sandflats and sandy beaches of sheltered coasts.	0	Habitat known to occur within area.	No	Dual Credit Species	No	Unlikely	Suitable habitat is absent from the proposal area. No specimens were observed during site surveys.
<i>Calidris ferruginea</i>	Curlew Sandpiper	E	CE	The migratory species occurs in Australia between August and mid-April, occupying littoral and estuarine habitats within intertidal mudflats of sheltered coasts. The species also occasionally occurs in non-tidal swamps, lakes and lagoons on the coast, and sometimes inland.	0	Habitat likely to occur within area.	No	Dual Credit Species	Yes	Unlikely	Suitable habitat is absent from the proposal area. No specimens were observed during site surveys.

Scientific Name	Common Name	BC Act	EPBC Act	Habitat Description and Locally Known Populations	BioNet Records	EPBC Act Protected Matters Report ²	BAM-C ³	Credit Type	Potential SAI	Likelihood of occurrence	Justification
<i>Numenius madagascariensis</i>	Eastern Curlew	P	CE	A primarily coastal distribution. The species is found in all states, particularly the north, east, and south-east regions including Tasmania. In NSW the species occurs across the entire coast but is mainly found in estuaries such as the Hunter River, Port Stephens, Clarence River, Richmond River and ICOLLs of the south coast.	1	Habitat known to occur within area	No	Dual Credit Species	Yes	Unlikely	May rarely forage within the dams present on site. No specimens were observed during site surveys.
<i>Ninox connivens</i>	Barking Owl	V	-	The Barking Owl is found throughout continental Australia, except for the central arid regions. Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. The species is flexible in its habitat use and may breed along timbered watercourses in heavily cleared habitats. Roosts in shaded portions of tree canopies, including tall midstorey trees with dense foliage such as <i>Acacia</i> and <i>Casuarina</i> species. Preferentially hunts small arboreal mammals such as Squirrel Gliders and Common Ringtail Possums.	5	N/A	Yes	Dual Credit Species	No	Low	Associated with PCT 3329. May occasionally hunt within the site as part of a larger home range. Hollow bearing trees suitable for nesting are absent.
<i>Ninox strenua</i>	Powerful Owl	V	-	Inhabits a wide range of vegetation types from wet eucalypt forests with a rainforest understorey to dry open forests and woodlands. Requires large hollow-bearing trees for nesting and dense canopy vegetation for roosting.	18	N/A	Yes	Dual Credit Species	No	Low	Associated with PCT 3329. May occasionally hunt within the site as part of a larger home range. Hollow bearing trees suitable for nesting are absent.
<i>Turnix maculosus</i>	Red-backed Button-quail	V	-	Occurs in central-eastern and north-eastern NSW as well as throughout the Kimberley region, through the Top End of Northern Territory and southern Gulf of Carpentaria, to Cape York Peninsula and eastern Queensland. The species inhabits grasslands, open and savannah woodlands with grassy understoreys, pastures and crops of warm temperate areas, typically only in regions subject to annual summer rainfall greater than 400mm. In NSW they occur in grasslands, heath and crops, preferring sites close to water, especially when breeding.	2	N/A	No	Species	No	Low	Habitat is available throughout the site although this is marginalised by the presence of livestock
<i>Tyto novaehollandiae</i>	Masked Owl	V	-	Extends from the coast where it is most abundant to the western plains. Overall records for this species fall within approximately 90% of NSW, excluding the most arid north-western corner. Lives in dry eucalypt forests and woodlands from sea level to 1100 m. A forest owl, but often hunts along the edges of forests, including roadsides.	4	N/A	Yes	Dual Credit Species	No	Low	Associated with PCT 3329. May occasionally hunt within the site as part of a larger home range. Hollow bearing trees suitable for nesting are absent.
<i>Tyto tenebricosa</i>	Sooty Owl	V	-	Occurring on the coast, coastal escarpment, and eastern tablelands of NSW. Occurs in rainforest, including dry rainforest, subtropical and warm temperate rainforest, as well as moist eucalypt forests. Nests in very large tree hollows.	2	N/A	No	Dual Credit Species	Yes	Low	May occasionally hunt within the site as part of a larger home range. Hollow bearing trees suitable for nesting are absent.
Mammals											
<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	V	E	Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Individual animals use hollow-bearing trees, fallen logs, small caves, rock crevices, boulder fields and rocky-cliff faces as den sites with basking and latrine sites often nearby.	16	Habitat known to occur within area.	Yes	Ecosystem	No	Low	Associated with PCT 3329. Potential foraging habitat is available within the site although this is highly marginalised given the disturbed nature of the proposal area. No potential den sites were observed during site surveys.

Scientific Name	Common Name	BC Act	EPBC Act	Habitat Description and Locally Known Populations	BioNet Records	EPBC Act Protected Matters Report ²	BAM-C ³	Credit Type	Potential SAI	Likelihood of occurrence	Justification
<i>Phascogale tapoatafa</i>	Brush-tailed Phascogale	V	-	Prefers dry sclerophyll open forest with a sparse groundcover of herbs, grasses, shrubs or leaf litter but is also known to inhabit heath, swamps, rainforest and wet sclerophyll forest. Nests and shelters in tree hollows with entrances 2.5 – 4 cm wide and uses many different hollows over a short time span.	44	N/A	Yes	Species	No	Moderate	Not recorded during targeted surveys. This species may occur within intact forest habitat occurring to the north of the proposal area and occasionally forage within the site. However, habitat within the proposal area is considered marginal given the absence of hollow-bearing trees and the disturbed nature of the understorey.
<i>Planigale maculata</i>	Common Planigale	V	-	Inhabits rainforest, eucalypt forest, heathland, marshland, grassland and rocky areas where there is surface cover, and usually close to water.	1	N/A	Yes	Species	No	Unlikely	Suitable habitat is absent given the disturbed nature of the understorey which is grazed and lacks suitable surface cover.
<i>Petauroides volans</i>	Southern Greater Glider	E	E	Distributed along the ranges and coastal plain of eastern Australia, where it inhabits a variety of eucalypt forests and woodlands. Presence and density of Greater Gliders is related to soil fertility, eucalypt tree species, disturbance history and density of suitable tree hollows. Home ranges are typically small (1 - 4 ha) but are larger in lower productivity forests and more open woodlands, and larger for males than for females, with male home ranges being largely non-overlapping.	5	Habitat known to occur within area.	Yes	Species	No	Low	Associated with PCT 3329. Marginal foraging habitat is present within VZ1. Nesting habitat is absent from the proposal area.
<i>Petaurus australis</i>	Yellow-bellied Glider	V	V	Found along the eastern coast to the western slopes of the Great Dividing Range, from southern Queensland to Victoria. Occurs in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. Den, often in family groups, in hollows of large trees. This species is very mobile and occupies large home ranges (20 to 85 ha) to encompass dispersed and seasonally variable food resources.	2	Habitat likely to occur within area.	Yes	Ecosystem	No	Low	Associated with PCT 3329. Marginal foraging habitat is present within VZ1. Nesting habitat is absent from the proposal area.
<i>Petaurus norfolcensis</i>	Squirrel Glider	V	-	Inhabits dry sclerophyll forests and woodlands preferably with a canopy composed of multiple species, a shrub or Acacia mid-storey and a heath understorey. Requires abundant tree hollows for refuge and nest sites.	24	N/A	Yes	Species	No	Moderate	Not recorded during targeted surveys. This species may occur within intact forest habitat occurring to the north of the proposal area and occasionally forage within the site. However, habitat within the proposal area is considered marginal given the absence of hollow-bearing trees and the disturbed nature of the understorey.
<i>Phascolarctos cinereus</i>	Koala	E	E	Inhabits eucalypt woodland and forest containing suitable food trees. Key food trees in the local area include <i>Eucalyptus tereticornis</i> (Forest Red Gum), <i>Eucalyptus robusta</i> (Swamp Mahogany), <i>Eucalyptus microcorys</i> (Tallowwood) and <i>Eucalyptus punctata</i> (Grey Gum).	1133	Habitat known to occur within area.	Yes	Dual Credit Species	No	Moderate	No signs of Koala, including scats or scratches on tree trunks, were recorded during targeted surveys. The remnant trees on site include several preferred food trees including <i>E. tereticornis</i> and <i>E. microcorys</i> ; however, connectivity is very limited and the site is unlikely to support core breeding habitat or provide a regular foraging resource.
<i>Aepyprymnus rufescens</i>	Rufous Bettong	V	-	The species' original range from Coen in north Queensland to central Victoria has been reduced to a patchy distribution from Cooktown, Queensland, to north-eastern NSW as far south at Mt Royal National Park. In	1	N/A	No	Species	No	Unlikely	Suitable habitat is absent from the proposal area.

Scientific Name	Common Name	BC Act	EPBC Act	Habitat Description and Locally Known Populations	BioNet Records	EPBC Act Protected Matters Report ²	BAM-C ³	Credit Type	Potential SAI	Likelihood of occurrence	Justification
				NSW it has largely vanished from inland areas but there are sporadic, unconfirmed cases from Pilliga and Torrington districts. Rufous Bettongs inhabit a variety of forests from tall, moist Eucalypt forest to open woodland, with tussock grass understorey. A dense cover of tall native grasses is the preferred shelter.							
<i>Notamacropus parma</i>	Parma Wallaby	V	V	Their range is now confined to the coast and ranges of central and northern NSW from the Gosford district to south of the Bruxner Highway between Tenterfield and Casino. Preferred habitat is moist eucalypt forest with thick, shrubby understorey, often with nearby grassy areas, rainforest margins and occasionally drier eucalypt forest.	0	Habitat may occur within area	No	Species	No	Unlikely	Suitable habitat is absent from the proposal area.
<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby	E	V	Extends from south-east Queensland to the Grampians in western Victoria, roughly following the line of the Great Dividing Range. Occupies rocky escarpments, outcrops, and cliffs with a preference for complex structures with fissures, caves and ledges, often facing north.	0	Habitat may occur within area.	Yes	Species	Yes	Unlikely	Suitable habitat is absent from the proposal area.
<i>Potorous tridactylus</i>	Long-nosed Potoroo	V	V	Known from a variety of habitats, including Rainforest, Open Forests and Woodlands with dense groundcover, and dense, wet coastal heathlands. Soft (often sandy) substrates are preferred by this species.	1	Habitat likely to occur within area.	No	Species	No	Unlikely	Suitable habitat is absent from the proposal area.
<i>Thylogale stigmatica</i>	Red-legged Pademelon	V	-	Patchily distributed along coastal and subcoastal eastern Australia from Cape York to the Hunter Valley in NSW. Inhabits forest with a dense understorey and ground cover, including rainforest, moist eucalypt forest and vine scrub.	0	N/A	Yes	Ecosystem	No	Unlikely	Associated with PCT 3329. Suitable habitat is absent from the proposal area.
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V	V	Occurs in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water and in vegetation with a dense canopy.	416	Roosting known to occur within area.	Yes	Dual Credit Species	No	Moderate	Associated with PCT 3329. The trees on site provide potential foraging habitat. No breeding camps were recorded or are known to occur within the proposal area.
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	V	V	Occupies dry sclerophyll forest and woodland. Roosts in caves, abandoned mud-nests of Fairy Martins and mine tunnels.	0	Habitat may occur within area.	Yes	Species	Yes	Low	Roosting habitat is absent from the subject site. Marginal foraging habitat is available throughout the site.
<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	V	-	Inhabits sclerophyll forests preferring moist habitats with trees taller than 20m. Generally, roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings.	1	N/A	Yes	Ecosystem	No	Moderate	The species may forage within the site. Large trees with dead branches and / or exfoliating bark may provide some marginal roosting habitat.
<i>Miniopterus australis</i>	Little Bent-winged Bat	V	-	Inhabits a range of generally well-timbered habitats including but not restricted to rainforest, vine thickets, wet and dry sclerophyll forest, coastal forests, and Banksia scrub. Requires caves for breeding but has been recorded roosting within tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and sometimes buildings.	26	N/A	Yes	Dual Credit Species	Yes	Moderate	Associated with PCT 3329. The species may forage within the site. Large trees with dead branches and / or exfoliating bark may provide some marginal roosting habitat.
<i>Miniopterus orianae oceanensis</i>	Large Bent-winged Bat	V	-	Inhabits a range of timbered habitats. Caves are the primary roosting habitat, but may also use derelict mines,	13	N/A	Yes	Dual Credit Species	Yes	Moderate	Associated with PCT 3329. The species may forage within the site. Large trees with dead branches and / or exfoliating bark

Scientific Name	Common Name	BC Act	EPBC Act	Habitat Description and Locally Known Populations	BioNet Records	EPBC Act Protected Matters Report ²	BAM-C ³	Credit Type	Potential SAI	Likelihood of occurrence	Justification
				storm-water tunnels, buildings, and other man-made structures.							may provide some marginal roosting habitat.
<i>Micronomus norfolkensis</i>	Eastern Coastal Free-tailed Bat	V	-	The Eastern Freetail-bat is found along the east coast from south Queensland to southern NSW. Occurs in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range.	8	N/A	Yes	Ecosystem	No	Moderate	Associated with PCT 3329. The species may forage within the site. Large trees with dead branches and / or exfoliating bark may provide some marginal roosting habitat.
<i>Myotis macropus</i>	Southern Myotis	V	-	Found in the coastal band from the north-west of Australia, across the top-end and south to western Victoria. Generally, roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm-water channels, buildings, under bridges and in dense foliage.	8	N/A	Yes	Species	No	Recorded	This species was recorded within the site. The dams within the site may provide some foraging habitat. Large trees with dead branches and / or exfoliating bark may provide potential roosting habitat.
<i>Phoniscus papuensis</i>	Golden-tipped Bat	V	-	Distributed along the east coast of Australia in scattered locations from Cape York Peninsula in Queensland to south of Eden in southern NSW. It also occurs in New Guinea. Found in rainforest and adjacent wet and dry sclerophyll forest up to 1000m. Also recorded in tall open forest, Casuarina-dominated riparian forest and coastal Melaleuca forests.	3	N/A	Yes	Ecosystem	No	Unlikely	Associated with PCT 3329. Dense forest typically used by this species is absent.
<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	V	-	Utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, although it is most commonly found in tall wet forest. Usually roosts in tree hollows but has also been recorded in buildings.	1	N/A	No	Ecosystem	No	Moderate	The species may forage within the site. Large trees with dead branches and / or exfoliating bark may provide some marginal roosting habitat.
<i>Pseudomys gracilicaudatus</i>	Eastern Chestnut Mouse	V	-	In NSW the Eastern Chestnut Mouse mainly occurs north from the Hawkesbury River area as scattered records along to coast and eastern fall of the Great Dividing Range extending north into Queensland. Mostly found, in low numbers, in heathland and is most common in dense, wet heath and swamps.	0	N/A	Yes	Ecosystem	No	Unlikely	Associated with PCT 3329. Suitable habitat is absent given the disturbed nature of the understorey which is grazed and lacks suitable surface cover.
<i>Pseudomys novaehollandiae</i>	New Holland Mouse	P	V	Is known to inhabit open heathlands, open woodlands with a heathland understorey, and vegetated sand dunes.	3	Habitat known to occur within area.	No	Ecosystem	No	Unlikely	Suitable habitat is absent given the disturbed nature of the understorey which is grazed and lacks suitable surface cover.
Reptiles											
<i>Myuchelys purvisi</i>	Purvis' Turtle	E	E	Endemic to the middle and upper reaches of the Manning River catchment area. It has been recorded from the Barnard, Barrington, Copplacurripa, Gloucester, Manning, Mummel, Nowendoc and Rowley Rivers as well as Bobin, Caparra, Dingo and Myall creeks. Habitat preference is for relatively shallow, clear, continuously fast-flowing rivers with rocky and sandy substrates.	0	Habitat likely to occur within area	No	-	No	Unlikely	No suitable habitat.

¹ Number of Bionet wildlife atlas records in selected area [North: -31.77 West: 152.33 East: 152.53 South: -31.97]

Appendix V - BAM-Calculator Outputs



BAM Vegetation Zones Report

Proposal Details

Assessment Id	Assessment name	BAM data last updated *
00019620/BAAS17100/20/00019621	Bushland Health Kolodong	14/03/2024
Assessor Name	Report Created	BAM Data version *
	27/06/2024	67
Assessor Number	Assessment Type	BAM Case Status
	Part 4 Developments (General)	Finalised
Assessment Revision	Date Finalised	BOS entry trigger
4	27/06/2024	BOS Threshold: Area clearing threshold

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

Vegetation Zones

#	Name	PCT	Condition	Area	Minimum number of plots	Management zones
1	3329_Moderate	3329-Northern Hinterland Valleys Red Gum Grassy Forest	Moderate	0.48	1	APZ (0.48 ha)

BAM Vegetation Zones Report

2	3329_Low	3329-Northern Hinterland Valleys Red Gum Grassy Forest	Low	23.5	4	
3	3329_Poor	3329-Northern Hinterland Valleys Red Gum Grassy Forest	Poor	1.01	1	MZ1 APZ (0.54 ha) MZ2 Direct (0.47 ha)

BAM Predicted Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00019620/BAAS17100/20/00019621	Bushland Health Kolodong	14/03/2024
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	27/06/2024	67
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Assessment Revision	BOS entry trigger	Date Finalised
4	BOS Threshold: Area clearing threshold	27/06/2024

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

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

Common Name	Scientific Name	Vegetation Types(s)
Barred Cuckoo-shrike	Coracina lineata	3329-Northern Hinterland Valleys Red Gum Grassy Forest
Black-chinned Honeyeater (eastern subspecies)	Melithreptus gularis gularis	3329-Northern Hinterland Valleys Red Gum Grassy Forest
Black-necked Stork	Ephippiorhynchus asiaticus	3329-Northern Hinterland Valleys Red Gum Grassy Forest
Brown Treecreeper (eastern subspecies)	Climacteris picumnus victoriae	3329-Northern Hinterland Valleys Red Gum Grassy Forest
Diamond Firetail	Stagonopleura guttata	3329-Northern Hinterland Valleys Red Gum Grassy Forest
Dusky Woodswallow	Artamus cyanopterus cyanopterus	3329-Northern Hinterland Valleys Red Gum Grassy Forest
Eastern Chestnut Mouse	Pseudomys gracilicaudatus	3329-Northern Hinterland Valleys Red Gum Grassy Forest
Eastern Coastal Free-tailed Bat	Micronomus norfolkensis	3329-Northern Hinterland Valleys Red Gum Grassy Forest
Eastern False Pipistrelle	Falsistrellus tasmaniensis	3329-Northern Hinterland Valleys Red Gum Grassy Forest

BAM Predicted Species Report

Eastern Osprey	<i>Pandion cristatus</i>	3329-Northern Hinterland Valleys Red Gum Grassy Forest
Golden-tipped Bat	<i>Phoniscus papuensis</i>	3329-Northern Hinterland Valleys Red Gum Grassy Forest
Greater Broad-nosed Bat	<i>Scoteanax rueppellii</i>	3329-Northern Hinterland Valleys Red Gum Grassy Forest
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	3329-Northern Hinterland Valleys Red Gum Grassy Forest
Large Bent-winged Bat	<i>Miniopterus orianae oceanensis</i>	3329-Northern Hinterland Valleys Red Gum Grassy Forest
Little Bent-winged Bat	<i>Miniopterus australis</i>	3329-Northern Hinterland Valleys Red Gum Grassy Forest
Little Eagle	<i>Hieraaetus morphnoides</i>	3329-Northern Hinterland Valleys Red Gum Grassy Forest
Little Lorikeet	<i>Glossopsitta pusilla</i>	3329-Northern Hinterland Valleys Red Gum Grassy Forest
Red-legged Pademelon	<i>Thylogale stigmatica</i>	3329-Northern Hinterland Valleys Red Gum Grassy Forest
Regent Honeyeater	<i>Anthochaera phrygia</i>	3329-Northern Hinterland Valleys Red Gum Grassy Forest
Scarlet Robin	<i>Petroica boodang</i>	3329-Northern Hinterland Valleys Red Gum Grassy Forest
South-eastern Glossy Black-Cockatoo	<i>Calyptorhynchus lathami lathami</i>	3329-Northern Hinterland Valleys Red Gum Grassy Forest
Speckled Warbler	<i>Chthonicola sagittata</i>	3329-Northern Hinterland Valleys Red Gum Grassy Forest
Spotted Harrier	<i>Circus assimilis</i>	3329-Northern Hinterland Valleys Red Gum Grassy Forest
Spotted-tailed Quoll	<i>Dasyurus maculatus</i>	3329-Northern Hinterland Valleys Red Gum Grassy Forest
Square-tailed Kite	<i>Lophoictinia isura</i>	3329-Northern Hinterland Valleys Red Gum Grassy Forest
Swift Parrot	<i>Lathamus discolor</i>	3329-Northern Hinterland Valleys Red Gum Grassy Forest
Varied Sittella	<i>Daphoenositta chrysoptera</i>	3329-Northern Hinterland Valleys Red Gum Grassy Forest
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	3329-Northern Hinterland Valleys Red Gum Grassy Forest
White-throated Needletail	<i>Hirundapus caudacutus</i>	3329-Northern Hinterland Valleys Red Gum Grassy Forest
Wompoo Fruit-Dove	<i>Ptilinopus magnificus</i>	3329-Northern Hinterland Valleys Red Gum Grassy Forest
Yellow-bellied Glider	<i>Petaurus australis</i>	3329-Northern Hinterland Valleys Red Gum Grassy Forest

Threatened species Manually Added

Common Name	Scientific Name
Eastern False Pipistrelle	<i>Falsistrellus tasmaniensis</i>

BAM Predicted Species Report

Greater Broad-nosed Bat	Scoteanax rueppellii
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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
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BAM Candidate Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00019620/BAAS17100/20/00019621	Bushland Health Kolodong	14/03/2024
Assessor Name	Report Created	BAM Data version *
	27/06/2024	67
Assessor Number	Assessment Type	BAM Case Status
	Part 4 Developments (General)	Finalised
Assessment Revision	Date Finalised	BOS entry trigger
4	27/06/2024	BOS Threshold: Area clearing threshold

* 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>Diuris flavescens</i> Pale Yellow Doubletail	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☒ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Eucalyptus largeana</i> Craven Grey Box	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☒ Apr ☒ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Eucalyptus seeana - endangered population</i> Eucalyptus seeana population in the Greater Taree local government area	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☒ Apr ☒ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

BAM Candidate Species Report

<i>Haliaeetus leucogaster</i> White-bellied Sea-Eagle	No (surveyed) *Survey months are outside of the months specified in Bionet.	☐ Jan ☐ Feb ☐ Mar ☒ Apr ☒ May ☐ Jun ☐ Jul ☒ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☒ Survey month outside the specified months?
<i>Hieraaetus morphnoides</i> Little Eagle	No (surveyed) *Survey months are outside of the months specified in Bionet.	☐ Jan ☐ Feb ☐ Mar ☒ Apr ☒ May ☐ Jun ☐ Jul ☒ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☒ Survey month outside the specified months?
<i>Lophoictinia isura</i> Square-tailed Kite	No (surveyed) *Survey months are outside of the months specified in Bionet.	☐ Jan ☐ Feb ☐ Mar ☒ Apr ☒ May ☐ Jun ☐ Jul ☒ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☒ Survey month outside the specified months?
<i>Myotis macropus</i> Southern Myotis	Yes (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☒ Oct ☒ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Petauroides volans</i> Southern Greater Glider	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☒ Apr ☒ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Petaurus norfolcensis</i> Squirrel Glider	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☒ Apr ☒ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

BAM Candidate Species Report

<i>Phascogale tapoatafa</i> Brush-tailed Phascogale	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☒ Apr ☒ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec
		☐ Survey month outside the specified months?
<i>Phascolarctos cinereus</i> Koala	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☒ Apr ☒ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec
		☐ Survey month outside the specified months?
<i>Pterostylis chaetophora</i> Pterostylis chaetophora	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☒ Oct ☐ Nov ☐ Dec
		☐ Survey month outside the specified months?
<i>Rhodamnia rubescens</i> Scrub Turpentine	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☒ Apr ☒ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec
		☐ Survey month outside the specified months?

Threatened species Manually Added

Common Name	Scientific Name
Pale Yellow Doubletail	Diuris flavescens

Threatened species assessed as not on site

Refer to BAR for detailed justification

Common name	Scientific name	Justification in the BAM-C
Barking Owl	Ninox connivens	Habitat constraints
Brush-tailed Rock-wallaby	Petrogale penicillata	Habitat constraints
Bush Stone-curlew	Burhinus grallarius	Habitat degraded Habitat constraints
Common Planigale	Planigale maculata	Habitat degraded

BAM Candidate Species Report

Eastern Cave Bat	Vespadelus troughtoni	Habitat constraints
Eastern Osprey	Pandion cristatus	Habitat constraints
Eastern Pygmy-possum	Cercartetus nanus	Habitat degraded
Emu population in the New South Wales North Coast Bioregion and Port Stephens local government area	Dromaius novaehollandiae - endangered population	Habitat degraded
Green and Golden Bell Frog	Litoria aurea	Habitat degraded
Grey-headed Flying-fox	Pteropus poliocephalus	Habitat constraints
Large Bent-winged Bat	Miniopterus orianae oceanensis	Habitat constraints
Large-eared Pied Bat	Chalinolobus dwyeri	Habitat constraints
Little Bent-winged Bat	Miniopterus australis	Habitat constraints
Masked Owl	Tyto novaehollandiae	Habitat constraints
Powerful Owl	Ninox strenua	Habitat constraints
Regent Honeyeater	Anthochaera phrygia	Habitat constraints
South-eastern Glossy Black-Cockatoo	Calyptorhynchus lathami lathami	Refer to BAR
Swift Parrot	Lathamus discolor	Habitat constraints

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00019620/BAAS17100/20/00019621	Bushland Health Kolodong	14/03/2024
Assessor Name	Report Created	BAM Data version *
	27/06/2024	67
Assessor Number	BAM Case Status	Date Finalised
	Finalised	27/06/2024
Assessment Revision	Assessment Type	BOS entry trigger
4	Part 4 Developments (General)	BOS Threshold: Area clearing threshold

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Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

Zone	Vegetation zone name	TEC name	Current Vegetation integrity score	Change in Vegetation integrity (loss / gain)	Area (ha)	Sensitivity to loss (Justification)	Species sensitivity to gain class	BC Act Listing status	EPBC Act listing status	Biodiversity risk weighting	Potential SAI	Ecosystem credits
Northern Hinterland Valleys Red Gum Grassy Forest												
1	3329_Moderate	Not a TEC	63.3	41.2	0.48	PCT Cleared - 79%	High Sensitivity to Gain			2.00		10

BAM Credit Summary Report

2	3329_Low	Not a TEC	6.3	6.3	23.5	PCT Cleared - 79%	High Sensitivity to Gain			2.00		0
3	3329_Poor	Not a TEC	21.4	13.3	1	PCT Cleared - 79%	High Sensitivity to Gain			2.00		7
											Subtotal	17
											Total	17

Species credits for threatened species

Vegetation zone name	Habitat condition (Vegetation Integrity)	Change in habitat condition	Area (ha)/Count (no. individuals)	Sensitivity to loss (Justification)	Sensitivity to gain (Justification)	BC Act Listing status	EPBC Act listing status	Potential SAIL	Species credits
<i>Myotis macropus / Southern Myotis (Fauna)</i>									
3329_Moderate	41.2	41.2	0.4			Vulnerable	Not Listed	False	8
3329_Low	6.3	6.3	0.44			Vulnerable	Not Listed	False	1
3329_Poor	13.3	13.3	0.33			Vulnerable	Not Listed	False	2
								Subtotal	11



BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00019620/BAAS17100/20/00019621	Bushland Health Kolodong	14/03/2024
Assessor Name	Assessor Number	BAM Data version *
		67
Proponent Names	Report Created	BAM Case Status
	27/06/2024	Finalised
Assessment Revision	Assessment Type	Date Finalised
4	Part 4 Developments (General)	27/06/2024
BOS entry trigger	* 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.	
BOS Threshold: Area clearing threshold		

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
Nil		
Species		
Nil		

Additional Information for Approval

Assessment Id	Proposal Name
00019620/BAAS17100/20/00019621	Bushland Health Kolodong



BAM Biodiversity Credit Report (Like for like)

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

PCT

No Changes

Predicted Threatened Species Not On Site

Name

No Changes

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

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
3329-Northern Hinterland Valleys Red Gum Grassy Forest	Not a TEC	25.0	0	17	17

3329-Northern Hinterland Valleys Red Gum Grassy Forest

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
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BAM Biodiversity Credit Report (Like for like)

	Coastal Valley Grassy Woodlands This includes PCT's: 618, 1603, 1604, 1691, 3312, 3314, 3315, 3318, 3319, 3320, 3323, 3325, 3327, 3328, 3329, 3330, 3332, 4052	Coastal Valley Grassy Woodlands $\geq 70\%$ and $< 90\%$	3329_Moderate	No	10	Karuah Manning, Hunter, Macleay Hastings, Mummel Escarpment and Upper Hunter. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Coastal Valley Grassy Woodlands This includes PCT's: 618, 1603, 1604, 1691, 3312, 3314, 3315, 3318, 3319, 3320, 3323, 3325, 3327, 3328, 3329, 3330, 3332, 4052	Coastal Valley Grassy Woodlands $\geq 70\%$ and $< 90\%$	3329_Low	No	0	Karuah Manning, Hunter, Macleay Hastings, Mummel Escarpment and Upper Hunter. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Coastal Valley Grassy Woodlands This includes PCT's: 618, 1603, 1604, 1691, 3312, 3314, 3315, 3318, 3319, 3320, 3323, 3325, 3327, 3328, 3329, 3330, 3332, 4052	Coastal Valley Grassy Woodlands $\geq 70\%$ and $< 90\%$	3329_Poor	No	7	Karuah Manning, Hunter, Macleay Hastings, Mummel Escarpment and Upper Hunter. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

BAM Biodiversity Credit Report (Like for like)

Species Credit Summary

Species	Vegetation Zone/s	Area / Count	Credits
Myotis macropus / Southern Myotis	3329_Moderate, 3329_Low, 3329_Poor	1.2	11.00

Credit Retirement Options

Like-for-like credit retirement options

Myotis macropus / Southern Myotis	Spp	IBRA subregion
	Myotis macropus / Southern Myotis	Any in NSW

BAM Biodiversity Credit Report (Variations)

Proposal Details

Assessment Id

00019620/BAAS17100/20/00019621

Assessor Name**Proponent Name(s)****Assessment Revision**

4

BOS entry trigger

BOS Threshold: Area clearing threshold

Proposal Name

Bushland Health Kolodong

Assessor Number**Report Created**

27/06/2024

Assessment Type

Part 4 Developments (General)

BAM data last updated *

14/03/2024

BAM Data version *

67

BAM Case Status

Finalised

Date Finalised

27/06/2024

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Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
Nil		
Species		
Nil		

Additional Information for Approval

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

BAM Biodiversity Credit Report (Variations)

PCT

No Changes

Predicted Threatened Species Not On Site

Name

No Changes

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

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
3329-Northern Hinterland Valleys Red Gum Grassy Forest	Not a TEC	25.0	0	17	17.00

3329-Northern Hinterland Valleys Red Gum Grassy Forest

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Coastal Valley Grassy Woodlands This includes PCT's: 618, 1603, 1604, 1691, 3312, 3314, 3315, 3318, 3319, 3320, 3323, 3325, 3327, 3328, 3329, 3330, 3332, 4052	Coastal Valley Grassy Woodlands > =70% and <90%	3329_Mod erate	No	10	Karuah Manning, Hunter, Macleay Hastings, Mummel Escarpment and Upper Hunter. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

BAM Biodiversity Credit Report (Variations)

	Coastal Valley Grassy Woodlands This includes PCT's: 618, 1603, 1604, 1691, 3312, 3314, 3315, 3318, 3319, 3320, 3323, 3325, 3327, 3328, 3329, 3330, 3332, 4052	Coastal Valley Grassy Woodlands >=70% and <90%	3329_Low	No	0	Karuah Manning, Hunter, Macleay Hastings, Mummel Escarpment and Upper Hunter. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Coastal Valley Grassy Woodlands This includes PCT's: 618, 1603, 1604, 1691, 3312, 3314, 3315, 3318, 3319, 3320, 3323, 3325, 3327, 3328, 3329, 3330, 3332, 4052	Coastal Valley Grassy Woodlands >=70% and <90%	3329_Poor	No	7	Karuah Manning, Hunter, Macleay Hastings, Mummel Escarpment and Upper Hunter. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Variation options					
	Formation	Trading group	Zone	HBT	Credits	IBRA region
	Grassy Woodlands	Tier 2 or higher threat status	3329_Moderate	No	10	IBRA Region: NSW North Coast, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Grassy Woodlands	Tier 2 or higher threat status	3329_Low	No	0	IBRA Region: NSW North Coast, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

BAM Biodiversity Credit Report (Variations)

	Grassy Woodlands	Tier 2 or higher threat status	3329_Poor	No	7	IBRA Region: NSW North Coast, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
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Species Credit Summary

Species	Vegetation Zone/s	Area / Count	Credits
Myotis macropus / Southern Myotis	3329_Moderate, 3329_Low, 3329_Poor	1.2	11.00

Credit Retirement Options Like-for-like options

Myotis macropus / Southern Myotis	Spp		IBRA region
	Myotis macropus /Southern Myotis		Any in NSW
	Variation options		
	Kingdom	Any species with same or higher category of listing under Part 4 of the BC Act shown below	IBRA region
	Fauna	Vulnerable	Karuah Manning, Hunter, Macleay Hastings, Mummel Escarpment and Upper Hunter. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Appendix VI - EPBC Protected Matters Assessment

CONSIDERATIONS UNDER THE EPBC ACT 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) requires approval of the Commonwealth Minister representing the Department of Climate Change, Energy, the Environment and Water (DCCEEW), for actions that may have a significant impact on Matters of National Environmental Significance (MNES). The EPBC Act also requires Commonwealth approval for certain actions on Commonwealth land.

MNES protected under the EPBC Act include:

- World Heritage properties;
- National Heritage places;
- RAMSAR wetlands of international importance;
- threatened species or ecological communities listed in the EPBC Act;
- migratory species listed in the EPBC Act;
- the Great Barrier Reef Marine Park;
- Commonwealth marine environment; and
- nuclear actions.

The EPBC protected matters search for the site is provided in **Appendix XI**.

With regard to flora and fauna, the only MNES relevant to the study area are nationally listed threatened communities, species and migratory species.

No nationally threatened species or EECs were recorded on site and none are considered likely to be significantly impacted given the highly disturbed nature of the proposal area. Impacts to threatened entities have been considered under the provisions of State legislation (BC Act) and impacts would be relatively minor given the existing condition of the site. Consequently, further assessment under the provisions of the EPBC Act is not warranted.

MIGRATORY SPECIES PROTECTED UNDER INTERNATIONAL AGREEMENTS

Six (6) terrestrial migratory species were listed on the EPBC protected matters search as having the potential to occur in the local area. Migratory species with potential to use habitats available within the proposal area are listed below.

Migratory species with the potential habitat available within the proposal area

Migratory Terrestrial Species	
<i>Cuculus optatus</i>	Oriental Cuckoo
<i>Hirundapus caudacutus</i>	White-throated Needletail
<i>Monarcha melanopsis</i>	Black-faced Monarch
<i>Myiagra cyanoleuca</i>	Satin Flycatcher
<i>Rhipidura rufifrons</i>	Rufous Fantail
<i>Symposiachrus trivirgatus</i>	Spectacled Monarch

The proposed development is considered to have negligible impact on these species, on the basis that all species are highly mobile, and the proposal impacts are minor in the context of surrounding habitat. The proposed works are unlikely to impact on any area considered to be 'important habitat' for the above migratory species, nor is it likely to impact a significant proportion of a migratory population.

Appendix VII - Koala Assessment Report

Koala Assessment Report –

Introduction

Describe the nature of the proposed development.

The proposal is for a seniors living community which would include the following components:

- A village comprised of 209 independent living units (ILUs), arranged in 8 precincts.
- Community facilities.
- RV and caravan parking.
- Communal landscaped areas and bushland reserve which includes a bushfire asset protection zone (APZ) in the northern portion of the site.
- A vegetated riparian zone (VRZ) along the drainage line in the western part of the site.

The proposal area is largely comprised of rural grazing land with native vegetation limited to isolated scattered trees and a relatively small patch of remnant woodland (approximately 0.5 ha in size) in the northeast of the site.

Impacts to vegetation include:

- Approximately 44 isolated trees would be removed to accommodate the proposal footprint.
- Remnant vegetation along the northern boundary would be partially retained forming part of the proposed APZ. Large trees (>80 cm DBH) and known food tree species would be preferentially retained within the APZ and the required 15 to 30% canopy coverage would be achieved by removal of trees with lesser habitat value.
- Scattered trees occurring within the APZ and VRZ would be retained.

Define how the SEPP applies to the proposed development.	Triggers	Response
	1) Is the site in a local government area with no approved Koala Plan of Management?	Yes. The site is located in the Mid-Coast Council Local Government Area and there is no approved Koala Plan of Management in place.
	2) The size of the site has an area of at least 1 hectare (including adjoining land within the same ownership)?	Yes. The proposal site exceeds 1 hectare.
	3) Does the proposed development require development consent from council?	Yes.
	4) Does the site contain “core” Koala habitat? Core habitat is defined as: a) an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable Koala habitat and where Koalas are recorded as being present at the time of assessment of the land as highly suitable Koala habitat; or b) an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable Koala habitat and where Koalas have been recorded as being present in the previous 18 years The definition of core Koala habitat under the Koala SEPP 2021 includes a reference to highly suitable habitat. Highly suitable habitat is where 15% or greater of the total number of trees within any Plant Community Type (PCT) are the regionally relevant species of those listed in Schedule 3 of the SEPP.	Yes. The site is likely to qualify as ‘core Koala habitat’ as: a) the site likely contains ‘highly suitable habitat’ as the major components of the canopy are listed Koala tree species, as per Schedule 3 of the SEPP, and exceed 15% of the total number of trees. These include <i>Eucalyptus tereticornis</i> , <i>Eucalyptus siderophloia</i> , <i>Corymbia intermedia</i> , <i>Corymbia maculata</i> , <i>Eucalyptus microcorys</i> and <i>Eucalyptus moluccana</i> . b) Nineteen (19) Koala records spanning the previous 18 years (3 Koala generations) occur within 2.5km of the site (BioNet, 2023). Four records occur within forest that provides connectivity to the northern boundary of the site.
	5) Is the development likely to have low or no impact on Koalas or Koala habitat?	No. The proposed development involves clearing of native vegetation within Koala habitat and is not considered low impact.
Development applications which are likely to impact Koalas and/or Koala habitat and do not meet the criteria for Tier 1 (Low or no direct impact development) must address the assessment criteria within a Koala Assessment Report. The proposal involves clearing of native vegetation within a Koala habitat area and consequently requires this Koala Assessment Report to supplement the DA.		

Principle 1: Understanding Koala Habitat Values – Criteria 1 and Criteria 2

Criteria 1

Describe whether core koala habitat is present within the site, as determined by a site area survey conducted by a suitably qualified and experienced person.

The proposal area is largely comprised of rural grazing land with native vegetation limited to isolated scattered trees and a relatively small patch of remnant woodland (approximately 0.5 ha in size) in the northeast of the site.

survey Vegetation plot surveys, tree, wildlife cameras and searches for signs of Koala habitation were undertaken during field surveys. The site was assessed as 'highly suitable habitat' as the almost all mature trees within the site are listed Koala use tree species, as per Schedule 3 of the SEPP. This includes locally preferred food trees, *Eucalyptus tereticornis* (Forest Red Gum) and two isolated *E. microcorys* (Tallowwood). Other Koala uses species recorded within the site include *E. siderophloia* (Grey Ironbark), *Corymbia maculata* (Spotted Gum), *C. intermedia* (Pink Bloodwood), *E. moluccana* (Grey Box).

No evidence of Koala usage (scats, scratches on the boles of trees) was recorded within the site and the absence of scratches on the smooth-barked Forest Red Gum suggest the site is not regularly used by Koalas. Four Koala records occur within intact forest extending to the north of the site and the remnant vegetation in the northwest of the site, largely located within the proposed APZ may provide some supplementary habitat for local Koalas. The isolated trees located throughout the site may also provide some cover for transient Koalas, albeit there is a low likelihood of usage given habitat to the east, west and south of the site is compromised by previous clearing and development and connectivity is poor.

Given the presence of 'highly suitable habitat' on site and recent records in the vicinity, the site meets the definition of core habitat under the SEPP.

Criteria 2

Describe the site context and provide an analysis of the significance of koala habitat values of the site in preserving the koala populations, including:

- Size, health and viability of Koala population
- Generational persistence of local populations
- Landscape context of habitat
- Do the habitat values serve an import ecological function for the species
- Is the habitat area and/or population using the site important for recovery of the species

The site area is located within the Comboyne Area of Regional Koala Significance (ARKS) (DPIE, 2020c). Koala populations within the Comboyne ARKS have been assessed as having moderate resilience; a high risk of fragmentation, dog attack and disease; a moderate risk of heat stress, vehicle strike, climate change and wildfire. The security of the Comboyne ARKS Koala population is considered moderate.

In the context of the local area, Koala activity is relatively low with only 19 Koala records spanning the previous 18 years occurring in the immediate area (2.5 km) with 968 Koala records occurring within the search area (10 km) (BioNet 2023). Four Koala records occur within forest to the north of the site and the extensive areas of forest to the north of the site are likely to provide important habitat for the local population.

The landscape surrounding the site is variegated, with intact forest habitat restricted to the north of the site and the surrounding areas to the south, east and west heavily affected by rural, residential and industrial development.

Whilst survey results suggest the site is not regularly used, Koalas may occasionally feed and seek shelter within the site, particularly the remnant vegetation in the north of the site given its proximity of the site to suitable habitat occurring to the north.

Habitat available within the site is not likely to be important for the recovery of the local population as it does not appear to be regularly used by Koalas, is heavily disturbed and does not provide a link to other habitat areas.

Principle 2: Avoid intensifying land use in koala habitat areas through appropriate landscape planning and site selection - Criteria 3

Criteria 3

Describe the site selection process, including how the development footprint has avoided core Koala habitat and what feasible alternative site selections were assessed.

The design of the proposal has implemented the following measures to avoid and minimise impacts to biodiversity:

- The proposal layout is largely sited within existing low condition grassland areas with limited habitat value.
- Remnant vegetation along the northern boundary would be partially retained forming part of the proposed APZ. Large trees (>80 cm DBH) and known food tree species would be preferentially retained within the APZ and the required 15 to 30% canopy coverage would be achieved by removal of trees with lesser habitat value.
- The vegetated riparian zone (VRZ) to be established along the drainage line in the western part site forms part of the proposal. The VRZ is highly degraded and revegetation works would be subject to a vegetation management plan (VMP).
- Mitigation measures to minimise impacts to biodiversity are provided in Section 6. Mitigation measures relevant to Koalas include:
 - The selection of trees and shrubs to be retained within the APZ areas is to be undertaken in consultation with a suitable ecologist and bushfire specialist. Preference should be given to retaining large trees and preferred Koala food trees within the APZ.
 - The area of clearing work is to be inspected for Koalas and other fauna by an ecologist immediately prior to commencement of any tree felling. If a Koala is present, works are to be suspended until the Koala moves along of its own volition.
 - Any boundary fencing must allow for the movement of Koalas across the site.
 - Koala proof fencing should be utilised to exclude Koalas from accessing pools if proposed.

Principle 3: Encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas - Criteria 4 & 5.

Criteria 4

Describe how the development avoids the direct loss of core koala habitat within the site area and avoids fragmentation.

As described above, the proposal layout is largely sited within existing low condition grassland areas with scattered trees which does not provide significant koala habitat or provide connectivity to other areas of Koala habitat.

Remnant vegetation occurring in the north of the site, which may provide some supplementary habitat for local Koalas, forms part of a proposed APZ. Large trees (>80 cm DBH) and known food tree species would be preferentially retained within the APZ and the required 15 to 30% canopy coverage would be achieved by removal of trees with lesser habitat value.

Criteria 5

Describe how core koala habitat is excluded from the development footprint.

Principle 4: Minimise potential direct impacts to Koalas through Koala sensitive design – Criteria 6, 7, & 8.

Criteria 6

Describe how direct impacts to core koala habitat are minimised to avoid fragmentation. This includes describing the ability for koalas to move across the landscape and impact the recovery and expansion of populations.

Criteria 7

Where loss of core koala habitat cannot be avoided, describe how the development is designed to retain higher value areas across the site and avoids fragmentation of habitat, both within the site and more broadly.

Criteria 8

Describe how the proposed development has been designed in a way that maintains the potential function of core koala habitat

As described above in Criteria 3 response.

The site is largely cleared and does not provide significant connectivity to other areas of Koala habitat. The presence of livestock and the lack of cover has the potential to be a significant threat to Koalas moving through the site. The existing drainage in the west of the site would be revegetated which may facilitate Koala movement through the site.

Remnant vegetation occurring in the north of the site, which may provide some supplementary habitat for local Koalas, forms part of a proposed APZ. Large trees (>80 cm DBH) and Koala food tree species would be preferentially retained within the APZ and the required 15 to 30% canopy coverage would be achieved by removal of trees with lesser habitat value. Isolated trees within the APZ would be retained.

The proposal impact is considered to be minor given the existing condition of the site and is not likely to significantly affect the recovery or expansion of the local population.

Principle 5: Implement best practice measures for the management of identified risks to Koalas – Criteria 9 & 10

Criteria 9

Identify all relevant direct and indirect risks to koalas associated with the development.

Risks to Koalas associated with the development include:

- Modification of 0.5 hectares of remnant forest habitat to accommodate the proposed APZ in the north of the site, although locally preferred feed trees would be preferentially retained.
- Removal of 44 mature trees occurring throughout the development footprint
- Potential injury or mortality to Koalas during vegetation clearing.

Attack by livestock is a common threat in paddocks with isolated trees and would no longer be present. Other risks including dog attack, vehicle collisions and restricted movement whilst ever present, are unlikely to be further exacerbated by the proposed development.

Criteria 10

Describe the best practice management measures to be implemented as part of the proposed development to manage the identified risks to Koalas or habitat.

The following measures shall be implemented to mitigate identified risks to Koalas:

- Pre-clearance surveys. The area of clearing is to be inspected for Koalas by an ecologist immediately prior to commencement of any tree felling. If a Koala is present in the proposed clearing envelope, works are to be suspended until the Koala moves along of its own volition.
- Ecologist supervision of clearing works and protocols for rescuing injured fauna.
- Any boundary fencing must allow for the movement of Koalas across the site.
- Koala proof fencing should be utilised to exclude Koalas from accessing pools if proposed.

Principle 6: Use compensatory measures only where they can be shown to better promote the aim of the SEPP – Criteria 11 & 12

Criteria 11

Detail how options to avoid, minimise and manage impacts have been exhausted prior to the use of compensatory measures.

Measures to minimise the ecological impact of the proposal are detailed within Section 6 of the Biodiversity Impact Assessment and the above Criteria 3 response. Where relevant, these measures should be incorporated into the conditions of consent for the proposal.

No additional compensatory measures are proposed.

Criteria 12

Describe any compensatory measures that will be implemented in response to the direct loss of habitat or comprise of potential function of koala habitat.

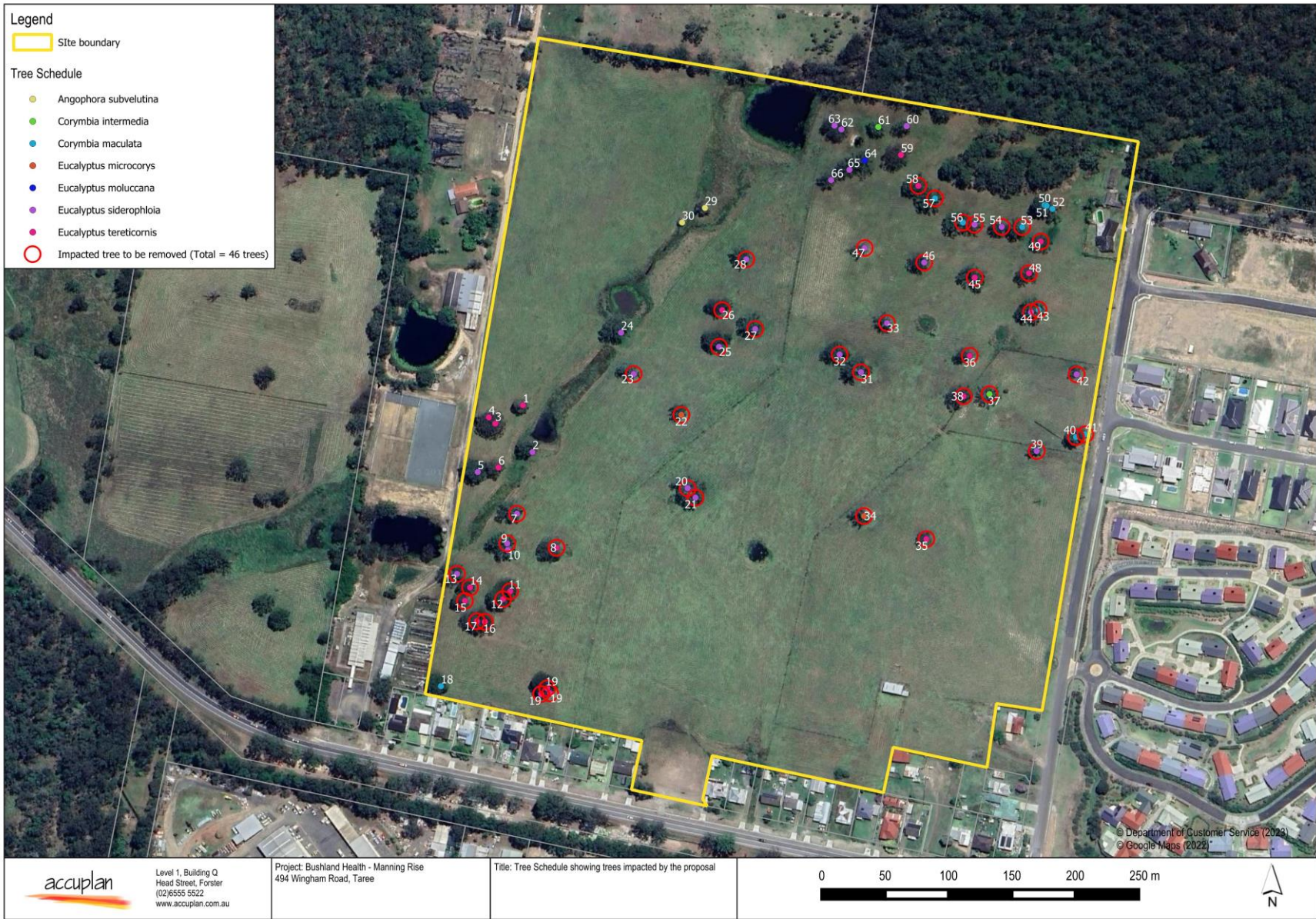
Principle 7: Use adaptive management strategies to monitor, evaluate and deliver appropriate planning outcomes for koalas – Criteria 13

Criteria 13

Detail how monitoring, adaptive management and reporting will be used to assess the proposed development against key planning outcomes for Koalas.

Given the relatively minor nature of the proposal, adaptive management strategies are not considered necessary. Monitoring and reporting of mitigation strategies, such as pre-clearance surveys and clearing supervision, will be used to assess the proposed development against planning outcomes for Koalas. Where relevant, monitoring and reporting requirements should be incorporated into the conditions of consent for the proposed subdivision.

Appendix VIII - Tree Schedule

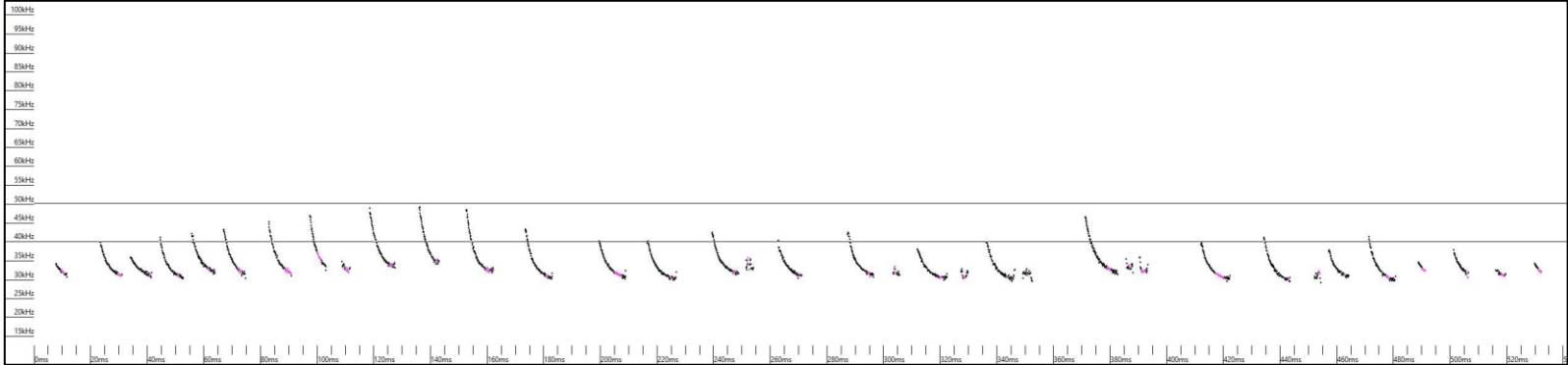
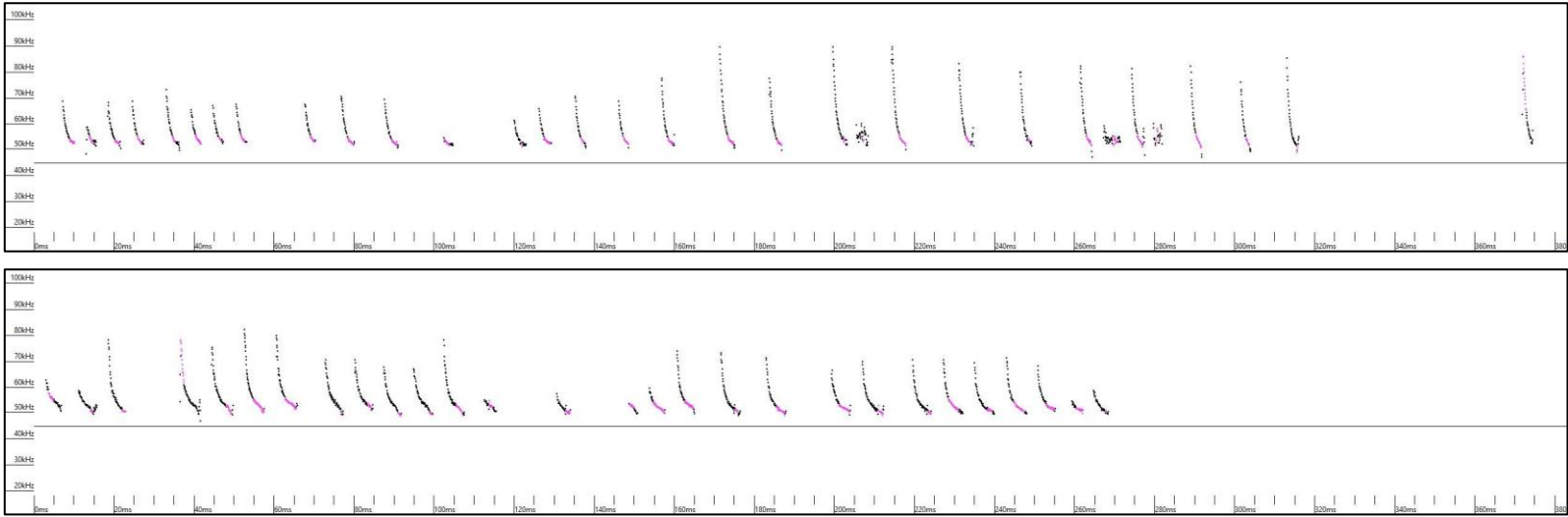


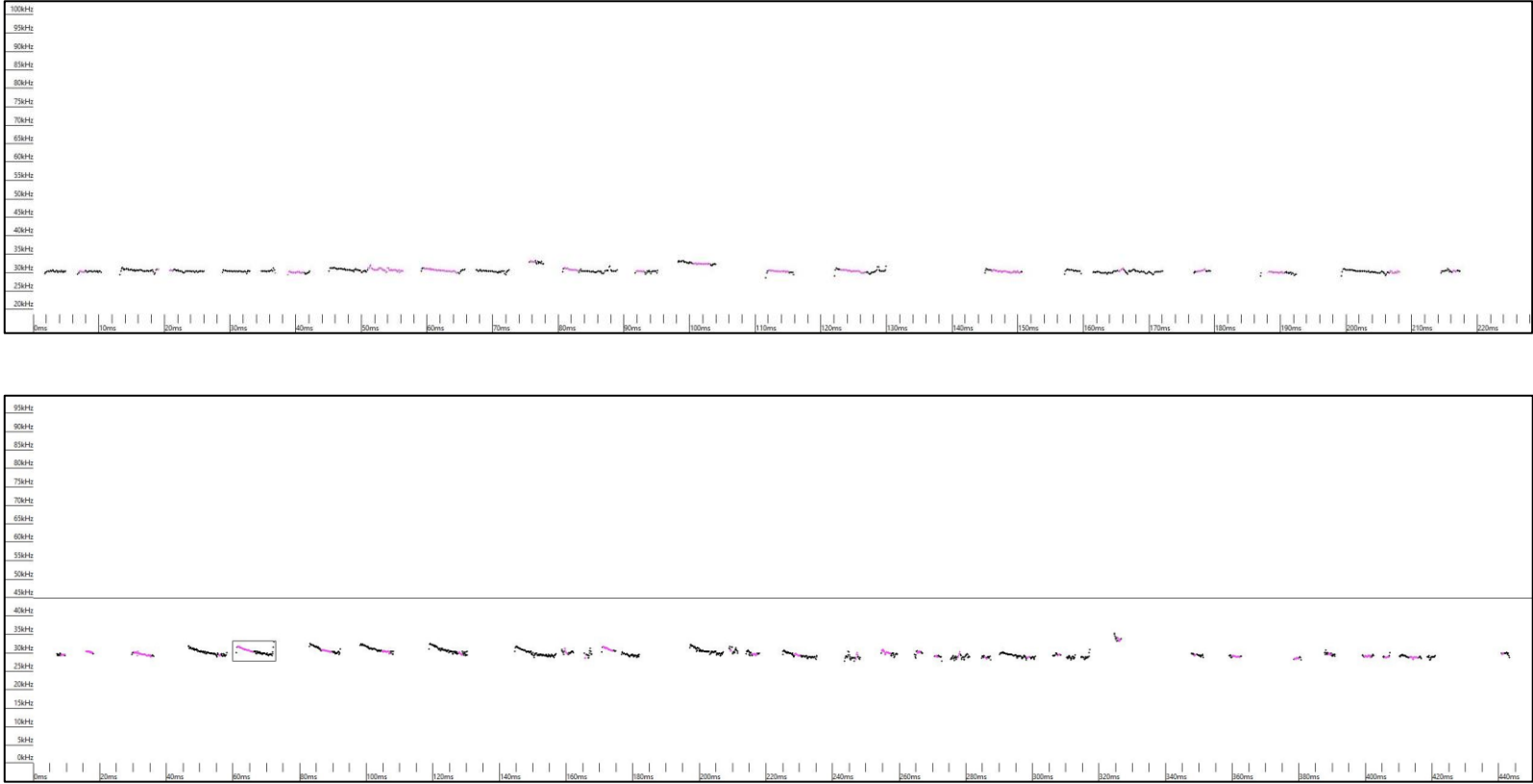
Tree Schedule

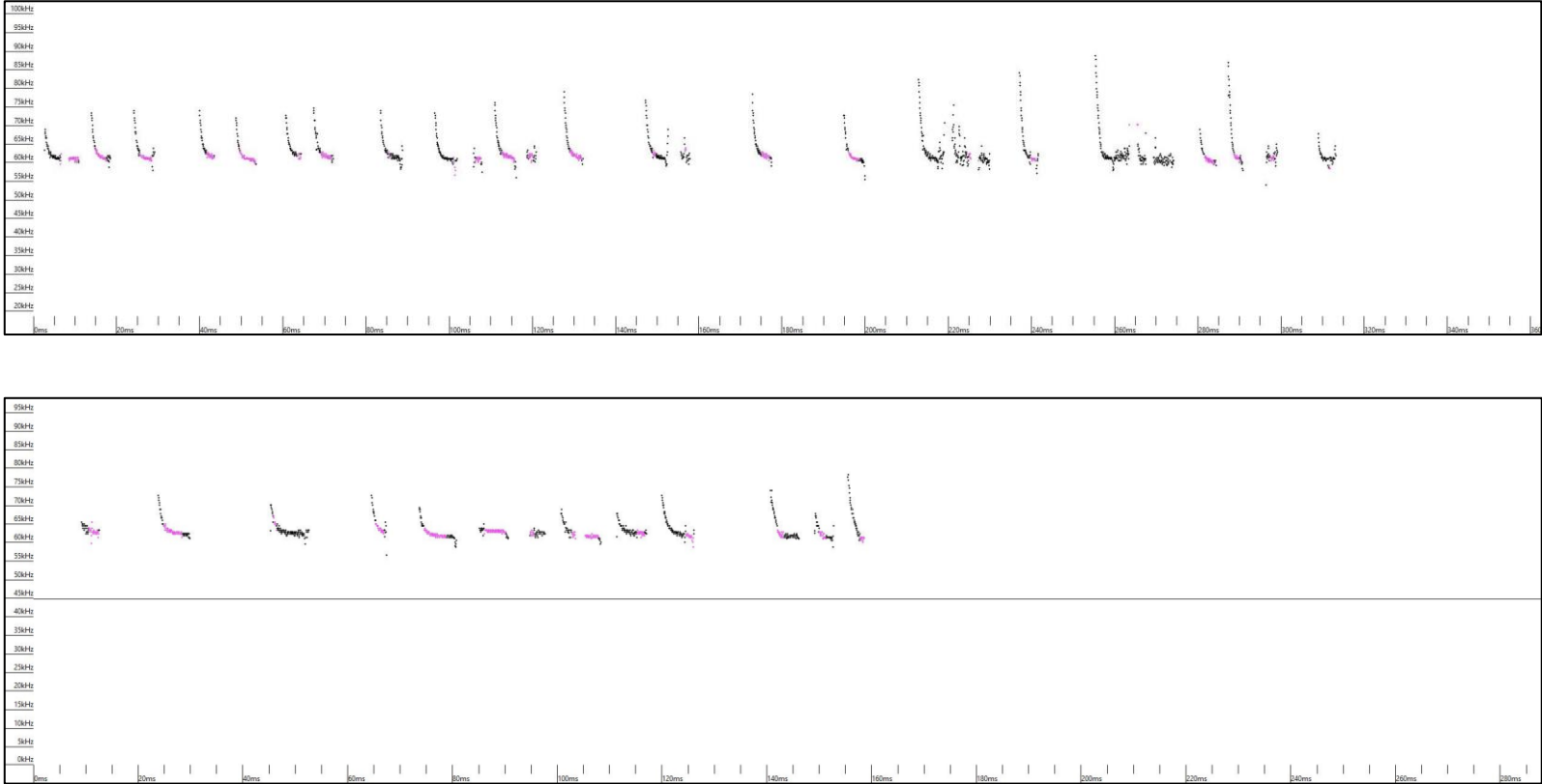
Tree No.	Species	Common Name	DBH (cm)	Notes
1	<i>Eucalyptus tereticornis</i>	Forest Red Gum	90	Retained
2	<i>Eucalyptus siderophloia</i>	Grey Ironbark	80	Retained
3	<i>Eucalyptus tereticornis</i>	Forest Red Gum	90	Retained
4	<i>Eucalyptus tereticornis</i>	Forest Red Gum	50	Retained
5	<i>Eucalyptus siderophloia</i>	Grey Ironbark	100	Retained
6	<i>Eucalyptus tereticornis</i>	Forest Red Gum	60	Retained
7	<i>Eucalyptus siderophloia</i>	Grey Ironbark	50	To be removed
8	<i>Eucalyptus tereticornis</i>	Forest Red Gum	90	To be removed
9	<i>Eucalyptus siderophloia</i>	Grey Ironbark	60	To be removed
10	<i>Eucalyptus siderophloia</i>	Grey Ironbark	60	Retained
11	<i>Eucalyptus tereticornis</i>	Forest Red Gum	120	To be removed
12	<i>Eucalyptus tereticornis</i>	Forest Red Gum	90	To be removed
13	<i>Eucalyptus siderophloia</i>	Grey Ironbark	70	To be removed
14	<i>Eucalyptus tereticornis</i>	Forest Red Gum	40	To be removed
15	<i>Eucalyptus tereticornis</i>	Forest Red Gum	50	To be removed
16	<i>Eucalyptus tereticornis</i>	Forest Red Gum	70	To be removed
17	<i>Eucalyptus tereticornis</i>	Forest Red Gum	70	To be removed
18	<i>Corymbia maculata</i>	Spotted Gum	70	Retained
19	<i>Eucalyptus tereticornis</i>	Forest Red Gum	55, 40, 35	To be removed. Three trees located close together.
20	<i>Eucalyptus siderophloia</i>	Grey Ironbark	70	To be removed
21	<i>Eucalyptus siderophloia</i>	Grey Ironbark	110	To be removed
22	<i>Eucalyptus microcorys</i>	Tallowwood	70	To be removed
23	<i>Eucalyptus siderophloia</i>	Grey Ironbark	70	To be removed
24	<i>Eucalyptus siderophloia</i>	Grey Ironbark	110	Retained
25	<i>Eucalyptus siderophloia</i>	Grey Ironbark	70	To be removed
26	<i>Eucalyptus tereticornis</i>	Forest Red Gum	115	To be removed
27	<i>Eucalyptus siderophloia</i>	Grey Ironbark	80	To be removed
28	<i>Eucalyptus siderophloia</i>	Grey Ironbark	70	To be removed
29	<i>Angophora subvelutina</i>	Broad-leaved Apple	40	Retained
30	<i>Angophora subvelutina</i>	Broad-leaved Apple	60	Retained
31	<i>Eucalyptus siderophloia</i>	Grey Ironbark	100	To be removed
32	<i>Eucalyptus siderophloia</i>	Grey Ironbark	100	To be removed
33	<i>Eucalyptus siderophloia</i>	Grey Ironbark	75	To be removed
34	<i>Eucalyptus microcorys</i>	Tallowwood	130	To be removed. Large termite nest with holes. Possible Kookaburra or Kingfisher nest.
35	<i>Eucalyptus tereticornis</i>	Forest Red Gum	55	To be removed

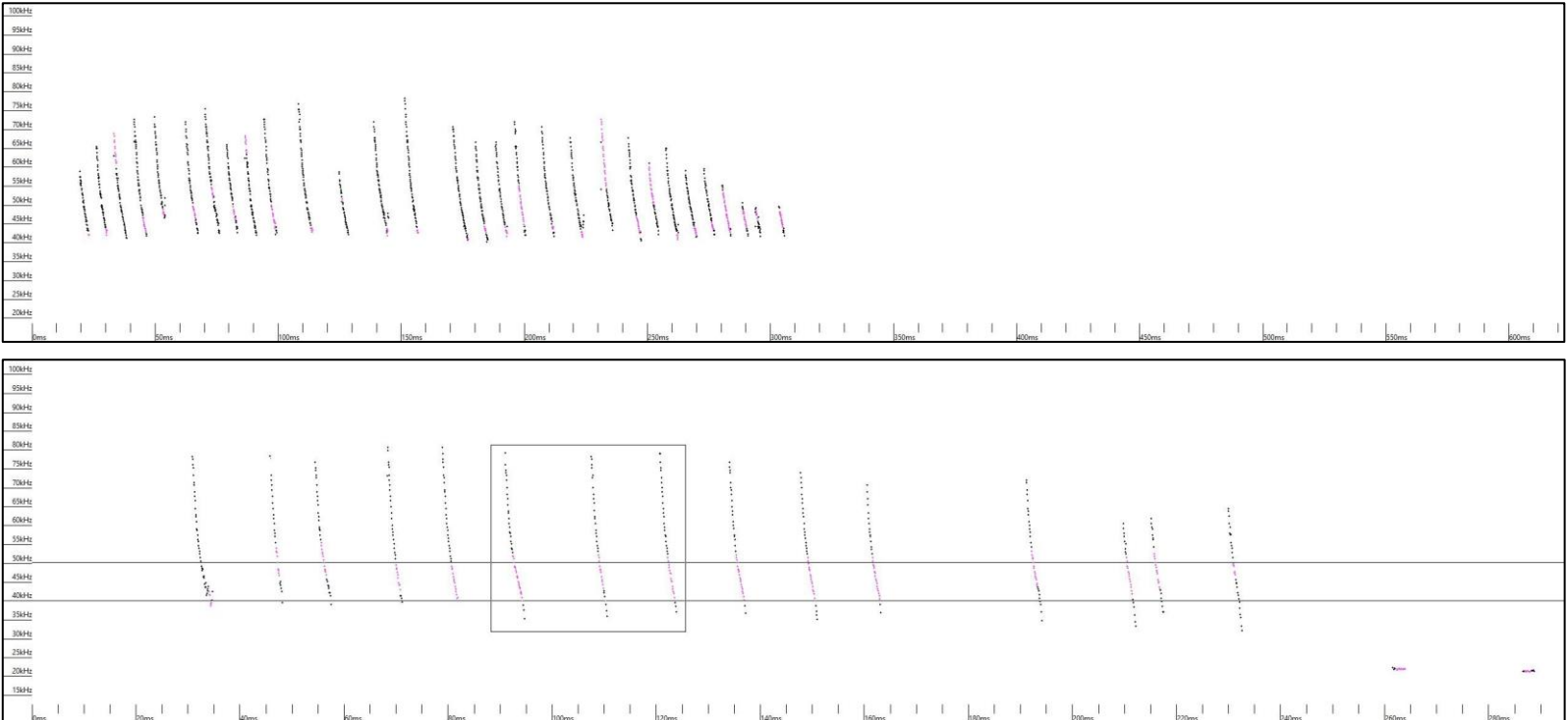
Tree No.	Species	Common Name	DBH (cm)	Notes
36	<i>Eucalyptus tereticornis</i>	Forest Red Gum	65	To be removed
37	<i>Corymbia intermedia</i>	Pink Bloodwood	55	To be removed
38	<i>Eucalyptus tereticornis</i>	Forest Red Gum	90	To be removed
39	<i>Eucalyptus siderophloia</i>	Grey Ironbark	50	To be removed
40	<i>Corymbia maculata</i>	Spotted Gum	50	To be removed
41	<i>Corymbia maculata</i>	Spotted Gum	55	To be removed
42	<i>Eucalyptus siderophloia</i>	Grey Ironbark	60	To be removed
43	<i>Corymbia maculata</i>	Spotted Gum	80	To be removed
44	<i>Eucalyptus siderophloia</i>	Grey Ironbark	60	To be removed
45	<i>Eucalyptus tereticornis</i>	Forest Red Gum	150	To be removed. Large tree. Potential for small hollows not visible from the ground.
46	<i>Eucalyptus siderophloia</i>	Grey Ironbark	60	To be removed
47	<i>Eucalyptus siderophloia</i>	Grey Ironbark	50	To be removed
19	<i>Eucalyptus tereticornis</i>	Forest Red Gum	40	To be removed
19	<i>Eucalyptus tereticornis</i>	Forest Red Gum	35	To be removed
48	<i>Eucalyptus tereticornis</i>	Forest Red Gum	65	To be removed
49	<i>Eucalyptus tereticornis</i>	Forest Red Gum	70	To be removed
50	<i>Corymbia maculata</i>	Spotted Gum	50	Retained
51	<i>Corymbia maculata</i>	Spotted Gum	51	Retained
52	<i>Corymbia maculata</i>	Spotted Gum	60	Retained
53	<i>Corymbia maculata</i>	Spotted Gum	70	To be removed
54	<i>Eucalyptus siderophloia</i>	Grey Ironbark	40	To be removed
55	<i>Eucalyptus siderophloia</i>	Grey Ironbark	60	To be removed
56	<i>Corymbia maculata</i>	Spotted Gum	80	To be removed
57	<i>Corymbia maculata</i>	Spotted Gum	100	To be removed
58	<i>Eucalyptus tereticornis</i>	Forest Red Gum	70	To be removed
59	<i>Eucalyptus tereticornis</i>	Forest Red Gum	100	Retained
60	<i>Eucalyptus siderophloia</i>	Grey Ironbark	50	Retained
61	<i>Corymbia intermedia</i>	Pink Bloodwood	50	Retained
62	<i>Eucalyptus siderophloia</i>	Grey Ironbark	70	Retained
63	<i>Eucalyptus siderophloia</i>	Grey Ironbark	55	Retained
64	<i>Eucalyptus moluccana</i>	Grey Box	75	Retained
65	<i>Eucalyptus siderophloia</i>	Grey Ironbark	65	Retained
66	<i>Eucalyptus siderophloia</i>	Grey Ironbark	60	Retained

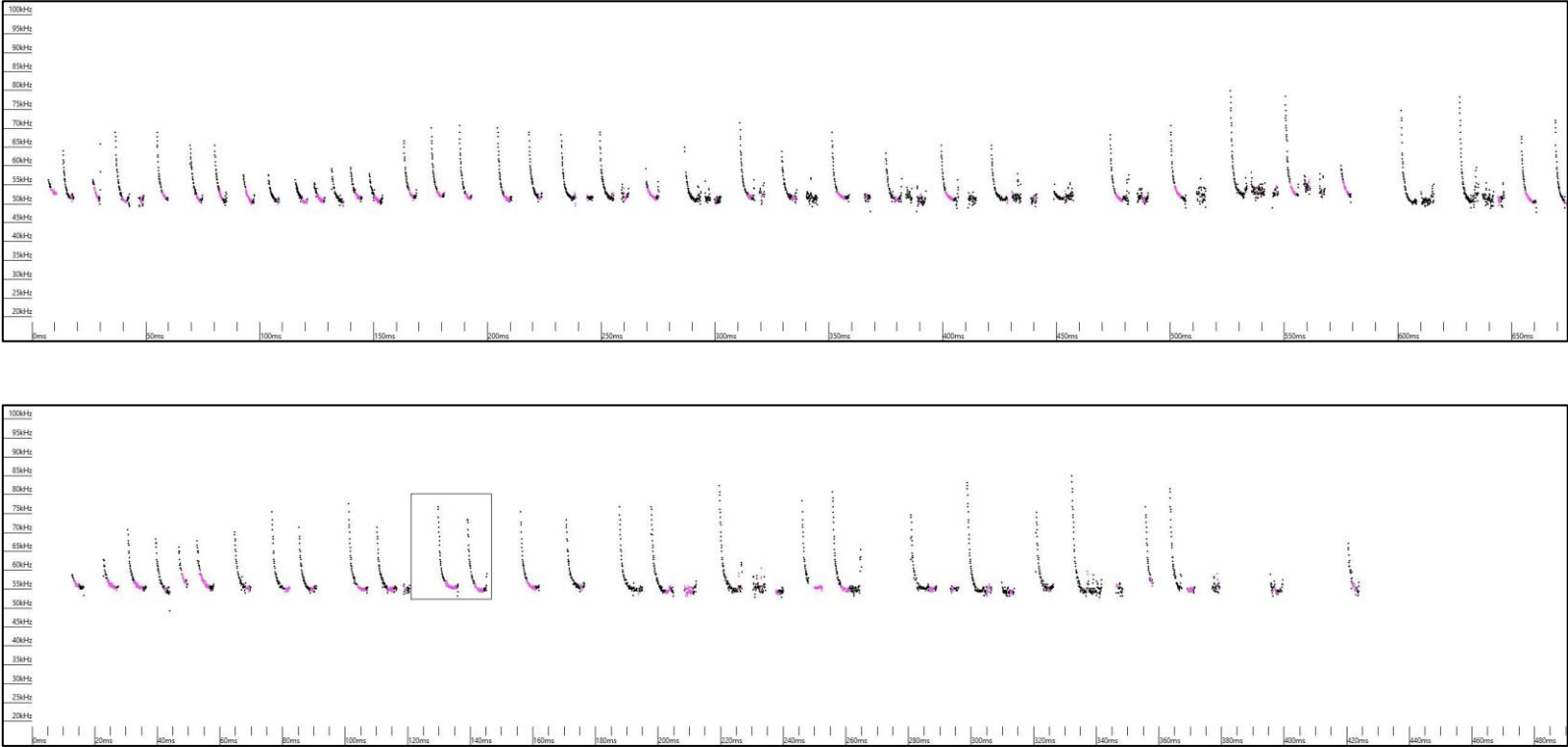
Appendix IX - Microchiropteran Bat Call Survey Results

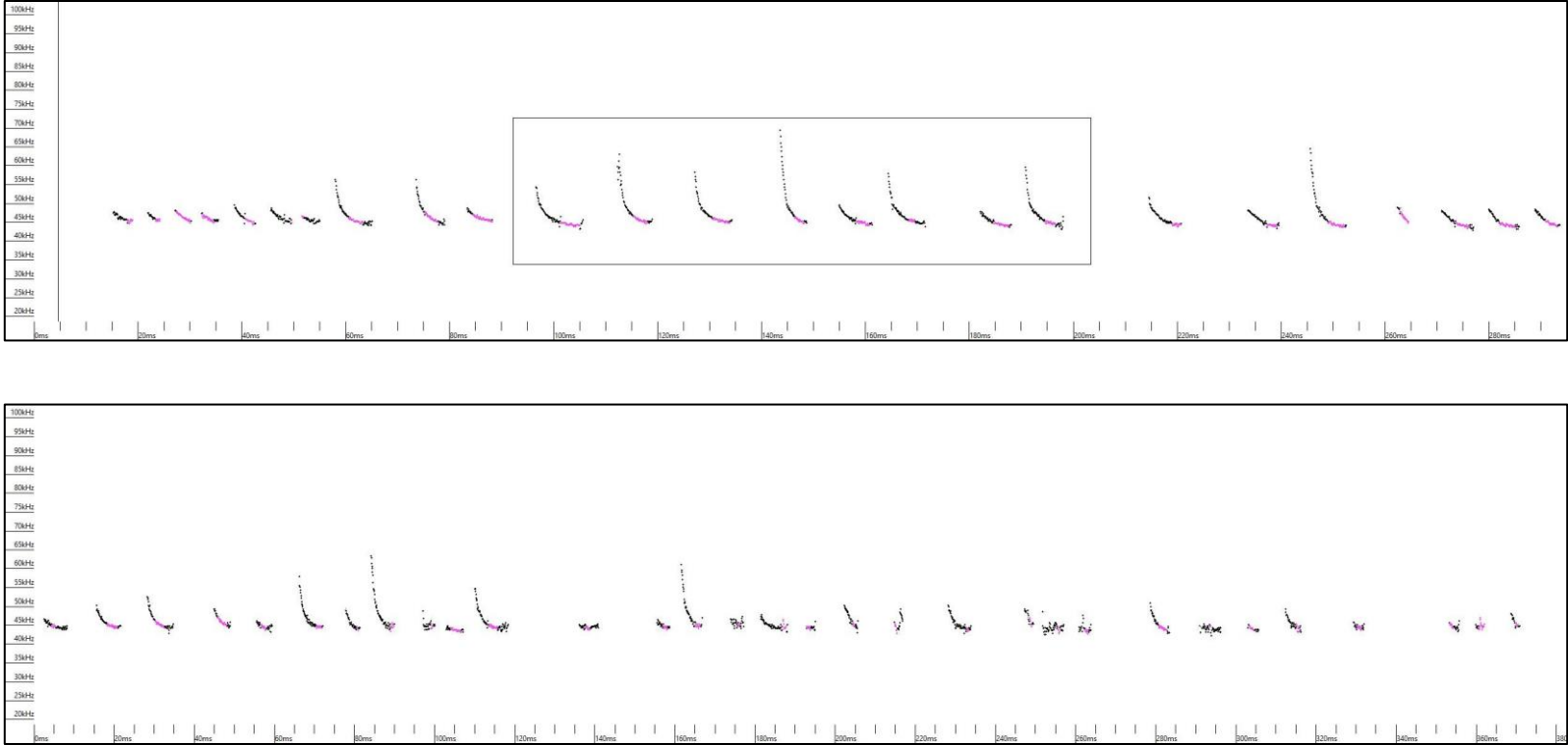
Species	Call ID confidence	Example Call / Notes
<i>Chalinolobus gouldii</i> Gould's Wattled Bat	Definite	Calls showed characteristic shape and frequency. Not likely to be mistaken for other local species. 
<i>Chalinolobus morio</i> Chocolate Wattled Bat	Probable	Characteristic frequency 46.5 to 53 kHz (Parnaby, 1992). Calls may overlap in frequency with <i>Vespadelus troughtoni</i>, <i>V. pumilus</i> and <i>V. vulturnus</i> but have been separated by the down sweeping tail usually visible in calls from this species. 

Species	Call ID confidence	Example Call / Notes
<i>Ozimops ridei</i> or <i>Micronomus norfolkensis</i>	Possible	Both species overlaps in frequency but <i>Micronomus norfolkensis</i> is generally distinguishable by the presence of an alternating pattern and distinctive pulse shape. Calls appeared to be more consistent with <i>O. ridei</i> however the quality of recorded calls were poor and could not be confidently differentiated. 

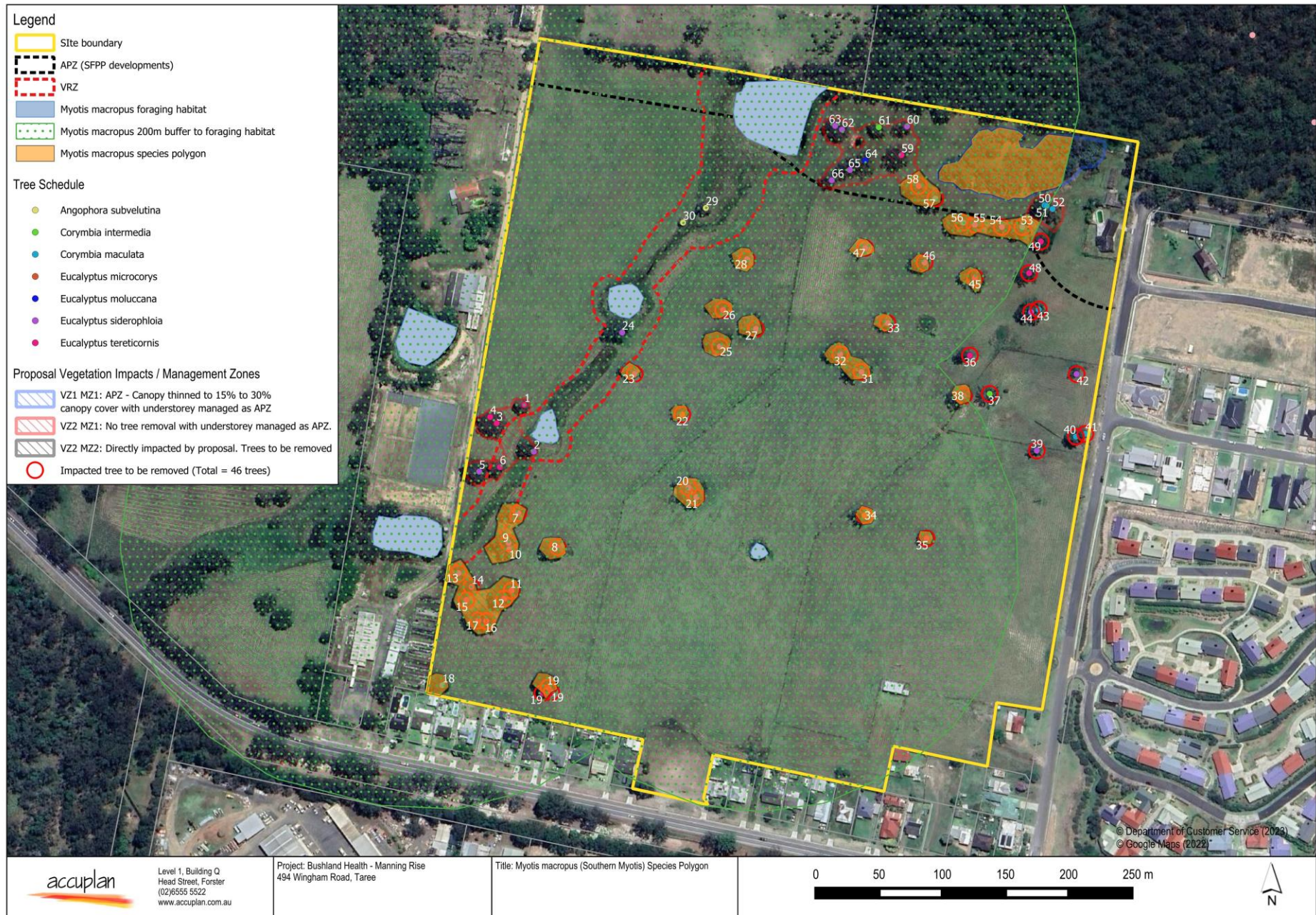
Species	Call ID confidence	Example Call / Notes
<i>Miniopterus australis</i>	Definite	Characteristic frequency 54.5 to 64.5 kHz (n = 53). Curved, usually with down-sweeping tail. Has a higher characteristic frequency than any other species with curved pulses. Overlaps in frequency with <i>Vespadelus pumilus</i> at 57 to 58 kHz, but can often be distinguished by the presence of a down-sweeping tail. 

Species	Call ID confidence	Example Call / Notes
<i>Myotis macropus</i>	Probable	<i>Myotis macropus</i> and <i>Nyctophilus</i> sp. calls are very similar and can be easily confused. Calls consistent with both species were recorded within the site. Some calls were able to be distinguished and attributable to <i>M. macropus</i> as the recorded calls had a pulse interval <75ms and an initial slope >400 octaves per second (OPS). 

Species	Call ID confidence	Example Call / Notes
<i>Vespadelus</i> sp. (<i>pumilus</i> , <i>troughtoni</i> or <i>vulturnus</i>)	Probable	Calls with a characteristic frequency between 51kHz and 56 kHz and an upsweeping tail have been grouped into <i>Vespadelus</i> sp. (<i>pumilus</i>, <i>troughtoni</i> or <i>vulturnus</i>). Within this range, the characteristic frequency can overlap and species cannot be confidently identified to a species level. 

Species	Call ID confidence	Example Call / Notes
<i>Miniopterus orianae</i> <i>oceanensis</i> / <i>Vespadelus darlingtoni</i> / <i>V. regulus</i>	Probable	Calls of these species overlap when the characteristic frequency is between 44kHz and 48kHz. These calls can be difficult to distinguish, particularly when a tail is absent or variable. 

Appendix X - Species Credit Polygons



Appendix XI - EPBC Protected Matters Search



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: 15-Sep-2023

[Summary](#)

[Details](#)

[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	5
Listed Threatened Species:	77
Listed Migratory Species:	42

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:	9
Commonwealth Heritage Places:	1
Listed Marine Species:	49
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:	5
Regional Forest Agreements:	1
Nationally Important Wetlands:	None
EPBC Act Referrals:	1
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

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
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community likely to occur within area	In feature area
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Community likely to occur within area	In feature area
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community likely to occur within area	In feature area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area	In buffer area only
Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions	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	Foraging, feeding or related behaviour likely to occur within area	In feature area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area	In buffer area only
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat may occur within area	In buffer area only
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Erythrorhynchus radiatus Red Goshawk [942]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area	In feature area
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
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat may occur within area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
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 likely to occur within area	In feature area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In buffer area only
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In buffer area only
FISH			
Epinephelus daemeli Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat likely to occur within area	In buffer area only
FROG			
Litoria aurea Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Mixophyes balbus Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Mixophyes iteratus Giant Barred Frog, Southern Barred Frog [1944]	Vulnerable	Species or species habitat likely to occur within area	In feature area
MAMMAL			
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	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
Notamacropus parma Parma Wallaby [89289]	Vulnerable	Species or species habitat may occur within area	In feature area
Petauroides volans Greater Glider (southern and central) [254]	Endangered	Species or species habitat known to occur within area	In feature area
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat known to occur within area	In feature area
Petrogale penicillata Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Potorous tridactylus tridactylus Long-nosed Potoroo (northern) [66645]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Roosting known to 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
Asperula asthenes Trailing Woodruff [14004]	Vulnerable	Species or species habitat known to occur within area	In feature area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area	In feature area
Cynanchum elegans White-flowered Wax Plant [12533]	Endangered	Species or species habitat known to occur within area	In feature area
Diuris flavescens Pale Yellow Doubletail, Wingham Doubletail [55075]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only
Eucalyptus glaucina Slaty Red Gum [5670]	Vulnerable	Species or species habitat known to occur within area	In feature area
Eucalyptus largeana Craven Grey Box [18581]	Endangered	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

Scientific Name	Threatened Category	Presence Text	Buffer Status
Leichhardtia longiloba listed as Marsdenia longiloba Clear Milkvine [91911]	Vulnerable	Species or species habitat may occur within area	In feature area
Macadamia integrifolia Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326]	Vulnerable	Species or species habitat may occur within area	In feature area
Melaleuca biconvexa Biconvex Paperbark [5583]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Parsonsia dorrigoensis Milky Silkpod [64684]	Endangered	Species or species habitat may occur within area	In buffer area only
Persicaria elatior Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat may occur within area	In feature area
Rhizanthella slateri Eastern Underground Orchid [11768]	Endangered	Species or species habitat may occur within area	In feature area
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Rhodomyrtus psidioides Native Guava [19162]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Solanum sulphureum [87381]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Syzygium paniculatum Magenta Lilly Pilly, Magenta Cherry, Daguba, Scrub Cherry, Creek Lilly Pilly, Brush Cherry [20307]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area	In feature area
Vincetoxicum woollsii listed as Tylophora woollsii [40080]	Endangered	Species or species habitat likely to occur within area	In feature area

REPTILE			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area	In buffer area only
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In buffer area only
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Myuchelys purvisi Purvis' Turtle [89459]	Endangered	Species or species habitat likely to occur within area	In feature area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat may occur within area	In buffer area only

SHARK			
Sphyrna lewini Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat likely to occur within area	In buffer area only

Listed Migratory Species		[Resource Information]	
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Ardenna grisea Sooty Shearwater [82651]		Species or species habitat likely to occur within area	In buffer area only
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat may occur within area	In buffer area only
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area	In buffer area only
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area	In buffer area only
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In buffer area only
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Migratory Marine Species			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area	In buffer area only
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In buffer area only
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status	
Mobula alfredi as Manta alfredi Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat may occur within area	In buffer area only	
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat may occur within area	In buffer area only	
Natator depressus Flatback Turtle [59257]		Vulnerable	Species or species habitat may occur within area	In buffer area only
Migratory Terrestrial Species				
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may 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
Monarcha melanopsis Black-faced Monarch [609]			Species or species habitat known to occur within area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]			Species or species habitat known to occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]			Species or species habitat known to occur within area	In feature area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area	In feature area	
Migratory Wetlands Species				
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area	
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area	In feature area	

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area	In buffer area only
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat likely to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pandion haliaetus Osprey [952]		Breeding known to occur within area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]		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 [11818]	NSW	In buffer area only
Commonwealth Land - Australian Postal Corporation [11822]	NSW	In feature area
Communications, Information Technology and the Arts - Telstra Corporation Limited		
Commonwealth Land - Australian Telecommunications Commission [11806]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - Australian Telecommunications Commission [11817]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [15879]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11823]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11824]	NSW	In buffer area only

Defence		
Defence - TAREE GRES DEPOT ; MACQUARIE DEPOT-41 RNSWR-TAREE [11203]	NSW	In buffer area only
Defence - Defence Housing Authority		
Commonwealth Land - Defence Housing Authority [15682]	NSW	In buffer area only

Commonwealth Heritage Places [Resource Information]			
Name	State	Status	Buffer Status
Historic			
Wingham Post Office	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 known to occur within area	In feature area
Anous stolidus			
Common Noddy [825]		Species or species habitat likely to occur within area	In buffer area only
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Ardenna grisea as Puffinus griseus			
Sooty Shearwater [82651]		Species or species habitat likely to occur within area	In buffer area only
Bubulcus ibis as Ardea ibis			
Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area overfly marine area	In buffer area only
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat likely to occur within area overfly marine area	In feature area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat may occur within area	In buffer area only
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area	In buffer area only
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		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 known 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
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
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 known to 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
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat likely to occur within area	In buffer area only
Pandion haliaetus Osprey [952]		Breeding known to occur within area	In buffer area only
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area	In buffer area only
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
Sterna striata White-fronted Tern [799]		Migration route may occur within area	In feature area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area overfly marine area	In feature area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche bulleri platei as Thalassarche sp. nov.			
Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche cauta			
Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In buffer area only
Thalassarche impavida			
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche melanophris			
Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche salvini			
Salvin's Albatross [64463]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thalassarche steadi			
White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Tringa nebularia			
Common Greenshank, Greenshank [832]		Species or species habitat may occur within area overfly marine area	In buffer area only
Reptile			
Caretta caretta			
Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area	In buffer area only
Chelonia mydas			
Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Dermochelys coriacea			
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In buffer area only
Eretmochelys imbricata			
Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Natator depressus			
Flatback Turtle [59257]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Brimbin	Nature Reserve	NSW	In buffer area only
Coocumbac Island	Nature Reserve	NSW	In buffer area only
Khappinghat	National Park	NSW	In buffer area only
Talawahl	Nature Reserve	NSW	In buffer area only
Wingham Brush	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	
Not controlled action					
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area	

Caveat

1 PURPOSE

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

The report contains the mapped locations of:

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

2 DISCLAIMER

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

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

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

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

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

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

4 LIMITATIONS

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

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

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

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

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

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

Acknowledgements

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

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- [-Natural history museums of Australia](#)
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- [-Other groups and individuals](#)

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

Please feel free to provide feedback via the [Contact us](#) page.

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