

Biodiversity Development Assessment Report

Proposed Subdivision of Lot 2 DP 1287077, Wolumla



Location photo October 2023 (E Larsen)

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All photos in this report by E. Larsen

EXECUTIVE SUMMARY

This Biodiversity Development Assessment Report (BDAR) has been prepared by Local Environmental Solutions on behalf of the proponent, Junor Investments Pty Ltd, for a proposed subdivision of Lot 2 DP1287077, Wolumla, NSW 2550, in the Bega Valley Shire Local Government Area.

The subdivision proposal is classified as a local development under Part 4 of the Environmental Planning and Assessment Act 1979. Part 4 developments are subject to the thresholds of the Biodiversity Offset Scheme (BOS), as specified by the Biodiversity Conservation Act 2016 (BC Act) and the Biodiversity Conservation Regulation 2017. The aim of this BDAR is to address the requirements of the BOS in accordance with the BC Act through the application of the BAM.

The Biodiversity Assessment Method (BAM) is the required assessment methodology for local developments that trigger the BOS under the BC Act. This report follows the field survey methods and the assessment format required for Stage 1 (Biodiversity Assessment) and Stage 2 (Impact Assessment) of the BAM.

Comprehensive mapping and field surveys were completed in accordance with the requirements of the BAM to identify credit obligations under the BOS. It was determined that the proposed clearing of 0.13 ha of wetland vegetation derived from Plant Community Type (PCT) 4050 South Coast Floodplain Wetland Paperbark Scrub will generate four Ecosystem Credits. The vegetation to be cleared does not meet the definition of any listed Threatened Ecological Communities.

Eighteen Candidate Species Credit Species required further assessment. Surveys for these species were carried out following DPE's taxa-specific survey guideline with regards to timing of the survey, method and survey effort. The presence of three Species Credit Species were recorded during site surveys: the Southern Myotis (*Myotis macropus*), the Squirrel Glider (*Petaurus norfolcensis*) and the Powerful Owl (*Ninox strenua*). For the Southern Myotis, 1.27 ha of suitable habitat would be impacted, generating thirteen Species Credits. For the Squirrel Glider and the Powerful Owl, 0.07 ha of suitable habitat would be impacted, generating 1 Species Credit each.

Thirty-two native and living paddock trees within the Subject Land meet the BAM 2020 definition of 'scattered trees'. The proposed removal of fourteen of these trees generated Ecosystem Credit obligations from two different PCTs: PCT 3332 Southeast Lowland Grassy Woodland (12 Ecosystem Credits) and PCT 4050 South Coast Floodplain Wetland Paperbark Scrub (2 Ecosystem Credit).

Consideration has been given to avoiding and minimising impacts to biodiversity in the planning of the proposal. Mitigation and management measures to address impacts associated with the proposal, both direct and indirect are considered in Stage 2 of the BDAR.

With the retirement of credits and effective implementation of the recommended mitigation measures, the proposal is consistent with the requirements of the BAM.

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GLOSSARY AND ABBREVIATIONS

Assessment Area	Area of land including the Subject Land and a 1500 m wide buffer area
APZ	Asset Protection Zone
BAM	Biodiversity Assessment Method
BAM-C	BAM Calculator
BC Act	Biodiversity Conservation Act 2016 (NSW)
BC Regulation	Biodiversity Conservation Regulation 2017 (NSW)
BDAR	Biodiversity Development Assessment Report
BOAMS	Biodiversity Offsets and Agreement Management System
BOS	Biodiversity Offsets Scheme
BVSC	Bega Valley Shire Council
DBH	Diameter at Breast Height
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)
EP&A Act	Environmental Planning and Assessment Act 1979 (NSW)
ha	Hectares
IBRA	Interim Biogeographic Regionalisation for Australia
LES	Local Environmental Solutions
LEP	Local Environmental Plan
LGA	Local Government Area
LLS Act	Local Land Services Act 2013 (NSW)
MNES	Matters of national environmental significance
NPW Act	National Parks and Wildlife Act 1974 (NSW)
NSW	New South Wales
PCT	Plant Community Type
SAIL	Serious and Irreversible Impact
SCA	State Conservation Area
Subject Land	Area of land subject to the BDAR, i.e. the proposed development footprint
Study Area	The entire Lot 2 DP1287077
TBDC	Threatened Biodiversity Data Collection
TEC	Threatened Ecological Community
*	An asterisk in front of a species name signifies exotic species

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: Elisabeth Larsen

Date: 22 April 2025

BAM Assessor Accreditation no: BAAS18161

This BDAR has been prepared to meet the requirements of BAM 2020.

ii. Conflict of interest

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

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

Signature: Elisabeth Larsen

Date: 22 April 2025

BAM Assessor Accreditation no: BAAS18161

iii. Details and experience of author/s and contributors

Name	BAM Assessor Accreditation	Position/Role	Tasks performed	Relevant qualifications
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Jackie Miles	-	Botanist Ecologist	BAM plot surveys PCT classification Targeted threatened flora surveys	BSc
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STAGE 1: BIODIVERSITY ASSESSMENT

1. INTRODUCTION

This Biodiversity Development Assessment Report (BDAR) has been prepared by Local Environmental Solutions on behalf of Junor Investments Pty Ltd (the Proponent) to accompany the amended Development Application (DA) no. 2023.351 for land known as Lot 2 DP 1287077, 22 Mine Lane, Wolumla, NSW. The amended DA proposes a Concept Master Plan for the Wolumla Valley Estate Project Area, comprising the first stage of development including the subdivision of land and associated construction work.

The Wolumla Valley Estate proposal (the Proposal) is classified as a local development under Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act). Part 4 developments are subject to the thresholds of the Biodiversity Offset Scheme (BOS), as specified by the NSW Biodiversity Conservation Act 2016 (BC Act) and the Biodiversity Conservation Regulation 2017 (BC Regulation).

A preliminary biodiversity assessment was completed in June 2022 to identify, map and review biodiversity constraints in the Study Area, with the aim to avoid and minimize impacts on ecological values in the planning and design of the development proposal (LES 2022). The development proposal which is assessed in this BDAR has been designed on the basis of the findings in this preliminary study.

Under the BC Act, the BOS is triggered for proposals where the clearing of native vegetation exceeds the BOS 'area clearing threshold', depending on the allowable minimum lot size for the Lot. The native vegetation clearing associated with the proposal exceeds this threshold, and a Biodiversity Development Assessment Report is therefore required.

The Biodiversity Assessment Method (BAM 2020) is the required assessment methodology for local developments that trigger the BOS. The aim of this BDAR is to address the requirements of the BOS in accordance with the BC Act through the application of BAM 2020. The BDAR also includes the assessment requirements of the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

1.1 Proposed development

1.1.1 Development overview

The Wolumla Valley Estate proposal seeks to develop 47.19 ha of land within Lot 2 DP 1287077 over 10 Stages. The aim is to create a total of 382 new residential lots that range in area from 449 m² to 5,381m² as well as 9 variably sized multi-dwelling housing lots with capacity to accommodate up to 96 dwellings collectively. Additionally, the proposal will create non-residential lots for a commercial precinct, a play area, and other infrastructure. Clearing for new public roads will also be required to provide access to new lots. All new lots will be connected to reticulated water and sewer. New lots generally to the perimeter of the proposed subdivision will require an Asset Protection Zone under Planning for bushfire Protection 2006, to achieve a BAL 29 rating.

The final layout map in **Figure 3 Development Layout Plan** and **Appendix J Subdivision Concept Plan** illustrate the indicative lot layout and new public roads proposed as part of the Wolumla Valley Estate development proposal.

The following terms will be used in this BDAR:

- **Subject Land:** The Subject Land, 47.19 ha, is defined as the total impact area associated with the development proposal. The Subject Land includes the subdivision footprint and a 40 m wide Asset Protection Zone along its southern boundary, as shown in **Figure 3 Development Layout Plan**. The Subject Land and the development footprint are equivalent for the purposes of this assessment, as defined in Clause 7.1(3) of the BC Regulation.
- **Study Area:** The Study Area, 68.57 ha, is defined as the area encompassed by Lot 2 DP 1287077.
- **Assessment Area:** The Assessment Area, 1193 ha, includes the Subject Land and a 1500 m wide buffer area surrounding the outside edge of the Subject Land.

1.1.2 Site Description

The Wolumla Valley Estate proposal is in a partly cleared rural-suburban landscape consisting of smaller suburban lots (Wolumla village), rural lifestyle blocks, larger cattle grazing holdings, and areas of public forest reserves in the wider landscape (Yurammie State Conservation Area, Bournda Nature Reserve). The proposal area is a mostly cleared rural block on undulating flats and the west-facing slope (3-30°) of a low hill directly south of Wolumla village. It is bounded to the north by Wolumla-Candelo Road and private property, by Mine Lane to the east, Ferndale Lane to the west, and by Yurammie SCA to the south (see **Figure 1 Site Map** and **Figure 2 Location Map**). The land is within the Bega Valley Local Government Area (LGA), approx. 18 km south of the Bega township.

Historically, Lot 2 DP 1287077 formed part of a larger cattle property and the land has been used for livestock grazing since the mid-1800's. Most of the vegetation on the property has therefore been disturbed to some degree, with the most intact native vegetation restricted to the south-eastern corner of the Lot, where there is a small area of remnant forest vegetation. However, heavily disturbed grazing land dominated by exotic pasture grasses makes up the bulk of the proposal area (the Subject Land).

The main habitat values identified within the Study Area consist of:

- Patches of remnant dry sclerophyll forest canopy in the southeast corner.
- Six west flowing drainage lines (1st and 2nd order streams) and nine artificial dams.
- An area of remnant riparian vegetation in the wet gully upstream from the largest dam.
- Mature paddock trees scattered across the exotic grassland area.
- A patch of derived native grassland on the elevated slope next to Mine Lane.

1.2 Biodiversity Offsets Scheme entry

Preliminary vegetation mapping of the Subject Land determined that the development proposal will require the clearing of approx. 2.01 ha of native vegetation (LES 2022). Under the BC Act, for a Lot with a minimum lot size between 1 ha and 40 ha, as is the case for parts of Lot 2 DP1287077 (BVSC LEP 2013), any proposed clearing of native vegetation in excess of 0.5 ha will trigger the BOS and the requirement for a BDAR to be submitted with the DA (Clause 7.2 of the BC Regulation). The development proposal will most likely generate biodiversity credit obligations that must be met as a condition of consent.

1.3 Excluded impacts

None of the Subject Land is excluded from impact or exempt from assessment, with regard to Clause 6.8 (3) of the BC Act.

1.4 Matters of national environmental significance

An EPBC Act Protected Matters Report was undertaken on 7 April 2025 (10 km buffer of the proposal footprint) to identify Matters of National Environmental Significance (MNES) that have the potential to occur in the Study Area. Those relevant to biodiversity and assessed in this BDAR include:

- Threatened Ecological Communities
- Threatened species
- Migratory species

The EBBC Protected Matters Report is provided in Appendix H.

1.5 Information sources used in this assessment

Key information sources used in this BDAR include:

- Subdivision development plans from Ocre Engineering (V Osgood, 9 April 2025)
- *Preliminary Biodiversity Assessment Lot 2 DP1287077* (Local Environmental Solutions, July 2022)
- Biodiversity Assessment Method (DPIE 2020) <https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Biodiversity/biodiversity-assessment-method-2020-200438.pdf>
- Biodiversity Assessment Method 2020 Operational Manual – Stage 1 (DPIE 2020)
- Biodiversity Assessment Method 2020 Operational Manual – Stage 2 (DPIE 2020)
- DPI profiles of threatened species, population, and ecological communities
- NSW Survey Guide for Threatened Plants and Their Habitat (DPIE 2020)
- Mitchell Landscape descriptions from “Descriptions for NSW (Mitchell) Landscapes, Version 2 (2002)”, Department of Environment and Climate Change NSW (2011)
- Australia’s IBRA Bioregions and sub-bioregions (IBRA v.7.0) Australia’s bioregions – maps DAWE
- Commonwealth Department of Environment and Energy ‘Protected Matters Search Tool’ <http://environment.gov.au/epbc/protected-matters-search-tool>
- NSW DPIE’s BioNet Threatened Biodiversity Data Collection (TBDC) <https://www.environment.nsw.gov.au/asmslightprofileapp/account/login?ReturnUrl=%2fAtlasApp%2fDefault.aspx>
- NSW DPIE’s BioNet Vegetation Classification Database <https://www.environment.nsw.gov.au/NSWVCA20PRapp/LoginPR.aspx>
- PlantNet NSW, the Royal Botanic Gardens and Domain Trust <https://plantnet.rbgsyd.nsw.gov.au/search/simple.htm>
- Wetlands NSW (DPIE 2020). Accessed through SEED.
- NSW Biodiversity Values Map and Threshold Tool <https://www.lmbc.nsw.gov.au/arcgis/rest/services/BV/BiodiversityValues/MapServer>
- SixMaps http://maps.six.nsw.gov.au/arcgis/rest/services/public/NSW_Imagery/MapServer
- The State Vegetation Type Map (SVTM), <https://datasets.seed.nsw.gov.au/dataset/nsw-state-vegetation-type-map>

2. METHODS

2.1 Site context methods

2.1.1 Landscape features

Landscape features in the Assessment Area, including the IBRA Region, IBRA Subregion, Mitchell Landscape, Strahler stream orders, mapped wetland areas and possible wildlife corridors were assessed using desktop image analysis and SEED map layers. Additional information on landform and soils was sourced from Tulau (1997).

The survey team (Ecologist and Botanist) undertook field reconnaissance visits on 14, 15, and 21-24 June 2022 to confirm the extent and condition of landscape features in the locality and on the Subject Land.

2.1.2 Native vegetation cover

To determine native vegetation cover on the Subject Land and in the Assessment Area, the survey team traversed the areas by foot (Subject Land) and car (remainder of Assessment Area) on 14 and 15 June 2022. Inspection of the best available aerial imagery (SixMaps and Google Earth) also assisted in mapping native vegetation in the Assessment Area. Unless otherwise verified by visual inspection, areas containing grasslands were assumed to be exotic grassland if associated with managed land, including rural farming land, recreational parks, and private lawns.

Mapping of native vegetation cover on the Subject Land was further refined while walking the boundaries of identified vegetation zones using a handheld GPS, on 23 October 2023 and 3 November 2023.

2.2 Vegetation assessment

2.2.1 Existing information

The following databases and maps were used to assist with identification of vegetation communities:

- the NSW State Vegetation Type Map (SVTM), accessed through SEED, to inspect the most recent vegetation mapping in the Study Area;
- the South East Local Land Services Biometric vegetation map [SELLS mapping], 2014. VIS_ID 4211 (Ecological 2014), accessed through SEED, to check former vegetation mapping in the Study Area, and
- the BioNet Plant Community Type database (power query) to build a list of candidate PCTs in the IBRA Subregion, and access information on each of these PCTs.

2.2.2 Mapping of native vegetation extent

A map of native vegetation extent and vegetation zones on the Subject Land was created using a handheld GPS (Garmin GPSMAP 64sx) to record waypoints while walking around the site. The GPS waypoints were later transferred to a GIS. GPS waypoints were also recorded for larger trees on site. The GPS points helped confirm the accuracy of the digitised map.

2.2.3 Plot-based vegetation survey

Three Plant Community Types (PCT) and eight distinct Vegetation Zones were identified within the Study Area, of which six Zones occurred within the boundaries of the Subject Land. The survey team completed twelve floristic vegetation survey plots (20 x 20 m) across the eight Vegetation Zones in the Study Area, which was more than needed to meet the number of BAM plots required for each Zone, in accordance with BAM Subsection 4.2.1.

2.2.4 Scattered paddock trees

A number of scattered mature paddock trees within the Subject Land met the BAM 2020 definition of 'scattered trees' (BAM 2020, B.1). All the scattered trees were identified, mapped and visually inspected in the field. The trees proposed to be cleared were assigned an assessment class, and the biodiversity offset requirements were determined following the guideline provided in Appendix B: Streamlined assessment module – scattered trees (BAM 2020, B.2 – B.6). Scattered trees were considered both in terms of ecosystem credits and as habitat for threatened species, and the biodiversity credits generated are additional to those created by applying the full BAM.

2.2.5 Vegetation integrity survey

Twelve vegetation integrity (VI) 20 m x 50 m survey plots were completed across the Study Area, in accordance with BAM Subsection 4.3.4 (see **Figure 5 Vegetation Zones in the Study Area**). The following methods were used to select sampling locations:

- Vegetation Zones 1, 2 and 4: There was insufficient area to randomize the location of 20 x 50 m VI survey plots within Vegetation Zones 1, 2 and 4. Therefore, BAM Plot 5 (Zone 1), and BAM Plots 2 and 6 (Zone 2) and BAM Plot 10 (Zone 4) were placed where space permitted within these three Vegetation Zones.
- Vegetation Zones 3, 5, 6–8: The survey plots were randomly placed within the confines of each identified Vegetation Zone.

2.3 Threatened flora survey methods

2.3.1 Review of existing information

The BioNet Atlas was accessed in July 2022, and again in April 2025, returning no records of threatened flora species within 5 km of the Study Area. No further species were considered for inclusion in the BAM assessment, drawing on expert knowledge (Ecologist J. Miles) of each species' habitat requirements and distribution.

A review of relevant literature and existing vegetation mapping (State Vegetation Map NSW, accessed on SEED, October 2023), indicated the potential presence in the locality of PCT 3332 Southeast Lowland Grassy Woodland. This PCT is associated with a Threatened Ecological Community (TEC), known as "Lowland Grassy Woodland in the South East Corner Bioregion", listed both in NSW and nationally.

2.3.2 Habitat constraints assessment

Threatened flora assessment: A survey team of two (Ecologist and Botanist) searched the entire Study Area for potential threatened flora species habitat on three separate site visits: 14 and 15 June 2022 and 7 July 2022 using the random meander method.

Threatened Ecological Communities (TEC) assessment: The survey team collected floristic data from eleven BAM plots within the Study Area, with minimum one plot in each identified Vegetation Zone. The data collected was used to identify the most likely PCT and their associated TEC status. The survey team also checked the key diagnostic criteria and condition thresholds for the most likely TECs to occur in the Study Area ('Lowland Grassy Woodland' and 'River-flat Eucalyptus Forest on Coastal Floodplains').

2.3.3 Field surveys

Systematic targeted surveys for four selected species identified by the BAM Calculator (BAM-C) as a 'Candidate Species Credit Species', Yellow Loosestrife (*Lysimachia vulgaris* var. *davurica*), Pomaderris Cotoneaster (*Cotoneaster pomaderris*), Hoary Sunray (*Leucochrysum albicans* subsp. *tricolor*), and Austral Toadflax (*Thesium australe*), were conducted on the Subject Land on 23 November and 5 December 2023, within the survey windows recommended for each species in the TBDC. These four species were also searched for during multiple site visits across the Study Area in June-July 2022 and October 2023.

2.4 Threatened fauna survey methods

2.4.1 Review of existing information

The BioNet Atlas, iNaturalist databases and the federal Protected Matters Search Tool were accessed in June 2022 and again in April 2025 for any records of threatened fauna within 10 km of the Subject Land. The BAM Calculator also provided a list of threatened fauna species associated with the Plant Community Types identified on the Subject Land.

2.4.2 Habitat constraints assessment

A survey team of two (Ecologist and Botanist/assistant) searched for threatened fauna habitat constraints and microhabitats on the Study Area on 21 June 2022. A systematic habitat features survey was carried out on 22 June 2022. On this occasion, the team identified and checked all scattered paddock trees (PCT 3332 and PCT 4050, large tree benchmark DBH $\geq$ 50 cm), and all mature trees in the forest area (PCT 3183, large tree benchmark DBH $\geq$ 80 cm), for habitat features (hollows, cracks, spouts, nests and dreys) and signs of use (feed marks, scratching, etc.). The team also searched for habitat features on the ground all across the Study Area (hollow down logs, rocks and boulders, rocky outcrops, soaks and pools) and signs of fauna presence (tunnels and runways, tracks and scats, crushed fruit and cones) (see **Figure 7 Habitat constraints**).

2.4.3 Field surveys

Systematic targeted surveys for evidence of presence of a suite of threatened fauna species identified by the BAM-C as a 'Candidate Species Credit Species' were conducted on the Subject Land within the survey windows recommended in the TBDC. Signs of presence of these species were also searched for during multiple site visits across the Study Area in June-July 2022 and October–December 2023.

3. SITE CONTEXT

3.1 Assessment area

A 1500 m wide buffer area was drawn around the Subject Land, and native vegetation was mapped within this Assessment Area (see **Figure 2 Location Map**). Native vegetation cover was assessed using existing vegetation mapping, best available aerial imagery (SixMaps 2014 and Google 2023) and verified by visual inspection.

3.2 Landscape features

Landscape features identified within the Subject Land and Assessment Area are shown on **Figure 2 Location Map** and **Figure 4 Assessment Area**. A discussion of relevant landscape features is provided below.

3.2.1 IBRA bioregions and subregions

Bioregions are large, geographically distinct areas of land with common characteristics such as geology, landform patterns, climate, ecological features, and flora and fauna communities. The development site is located within the IBRA bioregion “South East Corner” and the IBRA subregion “South East Coastal Ranges”. This was entered into the BAM Calculator for the proposal.

The South East Corner bioregion is characterised by a sub-humid climate with mild summers and winters. The geology is a combination of less eroded Sandstone to the north (Sydney Basin) with underlining Ordovician rocks with isolated intrusions of Granite to the south.

The differing geologies have a strong influence on regional topography. Granites in the Bega valley weather faster than the surrounding metamorphosed sediments and are eroded into local topographic basins. Pre-European vegetation types includes Forest Red Gum (*Eucalyptus tereticornis*) and Rough-barked Apple (*Angophora floribunda*) forests in lower elevations. These two species occur as scattered paddock trees on the Subject Land.

3.2.2 Landform and soils

The landform in the locality is undulating with forested low hills, cleared flats and shallow drainage lines. The area is likely to carry three separate soil landscapes (Tulau 1997): the ‘Bemboka soil landscape’, the Wolumla Creek soil landscape’ and the ‘Yellow Pinch soil landscape’. All three soil landscapes appear to be present on the proposed development site. Most of the lower part of the Subject Land which is now cleared and used for cattle grazing is probably underlain by granitoid rocks of the Bega batholiths, and two small granitoid outcrops were found on lower slope positions (see **Figure 7 Habitat constraints**). This geology gives rise to what Tulau (1997) refers to as the ‘Bemboka Soil Landscape’, found on undulating to rolling low hills on granodiorite in the Bega Valley.

In the lower parts of the drainage lines close to Ferndale Lane there would, prior to clearing, have been extensive strips of the ‘Wolumla Creek soil landscape’, consisting of “moderately broad to narrow floodplains of Quaternary alluvium in granitic catchments, mostly gullied” (Tulau 1997). Much of this soil landscape has been stripped out by gully erosion within the Bega Valley, but the Subject Land is located

above one of the very few intact remnants of this soil landscape and its attendant wetland community, on a property immediately west of Ferndale Lane.

The south-eastern and most elevated part of the Subject Land carries the 'Yellowpinch soil landscape' on Devonian sandstone and conglomerate, which is more abundant in the ranges to the south of Wolumla. There are small sandstone outcrops present in the pasture in this elevated part of the study site, and cobbles weathered out of eroded conglomerate are scattered all over the soil surface on the upper slope, with occasional larger surface lumps of conglomerate found lower on the Subject Land in areas to which they must have rolled in the distant past.

3.2.3 Rivers and streams

The Study Area has six west-flowing drainage lines (1st order streams) that merge in pairs into three 2nd order ephemeral streams (NSW Water Management Regulation 2018 Hydro Line spatial data, Strahler stream order classification system). They drain into a low-lying wetland area with a 3rd order waterway to the west of the Subject Land. This waterway flows north to join Frogs Hollow Creek, approx. 150 m further downstream near the underpass of Candelo-Wolumla Road. Frogs Hollow Creek is part of the Bega River catchment.

Inspections of the streams and drainage lines were carried out in late June 2022 after an extended period of relatively wet weather. All the drainage lines have semi-defined banks. However, due to persistent cattle grazing they carry minimal native riparian vegetation; they are partially silted up, weedy and have very little surface water. In their current state, the drainage lines provide minimal habitat value (foraging resources, shelter, breeding habitat) for wetland fauna, such as waterbirds and frogs.

3.2.4 Wetland

There are nine artificial dams in the Study Area, of which six occur on the Subject Land (see **Figure 7 Habitat constraints** and **Photos 6-3**). After periods of extended rain, all the dams have emergent native aquatic plants and would provide some degree of habitat value for wetland flora and fauna. However, except for the largest dam on site, the habitat value of the dams and their riparian zones are significantly reduced due to access by stock and very limited riparian vegetation.

The largest dam on the Subject Land has some riparian vegetation surrounding it, including a small remnant patch (80 x 20 m) of riparian vegetation, with a small stand of regrowth Swamp Paperbark (*Melaleuca ericifolia*), Common Reed (*Phragmites australis*) and a few other wetland species, including a single specimen of Swamp Gum (*Eucalyptus ovata*). A number of waterbird species were observed on the days of inspection in June 2022, Black Duck, Australasian Grebe, Hoary-headed Grebe, Grey Teal, Cinnamon Teal, Black Swan, Eurasian Coot and Purple Swampphen, and the Australian Reed Warbler and Golden-headed Cisticola heard and seen in the tall reeds. The Common Eastern Froglet were heard on all site visits in this area.

3.2.5 Habitat connectivity

The landscape within the Subject Land has been heavily cleared in the past and in effect lacks functional habitat connectivity. Remnant native vegetation is restricted to isolated paddock trees, a small area of riparian vegetation upstream of the largest dam, and patches of native forest canopy at the edge of the Subject Land to the south-east.

The wetland vegetation along the watercourse in the north provides the main connectivity corridor for ground-dwelling fauna in this cleared landscape. This large dam supplies permanent water and has some associated groundcover dominated by native grasses and reeds; however tree cover is absent.

The isolated and scattered paddock trees provide some habitat connectivity for more disturbance tolerant and mobile species to travel across the landscape.

In the wider landscape, substantial tracts of forest vegetation occur outside the development footprint to the south and north. The Subject Land is at the edge of these forest reserves, including Bournda Nature Reserve to the north, Yurammie SCP to the south, and Yurammie State Forest to the south-east. They are linked to the South East Forests National Park and extensive areas of public forest reserves along the coast and the Great Dividing Range.

3.2.6 Karst, caves, crevices, cliffs, rocks or other geological features of significance

No karst, caves, crevices, cliffs, rocks or other geological features of significance occur in or adjacent to the Subject Land.

3.2.7 Areas of outstanding biodiversity value

No areas of outstanding biodiversity values occur in or adjacent to the Subject Land.

3.2.8 NSW Mitchell landscape

The Study Area is within the Mitchell landscape “Bega Granites”. This was entered into the BAM Calculator for the proposal.

3.2.9 Soil hazard features

No soil hazard features, such as Sulphate Soils, Groundwater Vulnerability, Salinity or Flood Hazard, are mapped for the Subject Land or within the Assessment Area.

3.3 Native vegetation cover

As determined by GIS mapping from aerial imagery, approximately **664 ha** of native vegetation occurs within the 1500 m buffer area, calculated to be **56%** native vegetation cover (see **Figure 4 Assessment Area**). This was entered into the BAM calculator for the proposal.

Table 3-1 Native vegetation cover in the Assessment Area

Assessment Area (1500 m buffer area)	1193 ha
Total area of native vegetation cover (‘patch size’)	664 ha
Percentage of native vegetation cover	56%
Native vegetation cover (0-10 %, >10-30 %, >30-70 % or >70 %)	> 30–70 %

4. NATIVE VEGETATION, THREATENED ECOLOGICAL COMMUNITIES AND VEGETATION INTEGRITY

4.1 Native vegetation extent

4.1.1 Native vegetation

Approximately 2.01 ha of native vegetation occurs within the Subject Land. This occurs as remnant native vegetation comprising:

- 1.27 ha of wetland vegetation,
- 0.19 ha of derived grassland ('native pasture'),
- 0.07 of remnant overstorey woodland vegetation, and
- 0.48 ha of derived wet grassland ('wet exotic pasture')

4.1.2 Scattered trees

Thirty-two native and living paddock trees occur within the exotic grassland area on the Subject Land (see **Figure 7 Habitat constraints**). For the purpose of this BDAR, scattered paddock trees were defined as:

- one tree or a group of up to three trees less than 50 m apart from each other, and
- over an exotic groundcover, and
- more than 50 m away from any other living tree greater than 20 cm DBH (BAM 2020).

The scattered paddock tree data is provided in **Appendix B Scattered paddock trees**.

4.1.3 Exotic pasture areas

Approximately 44.5 ha, 94% of the development site, consists of cleared pasture areas which are currently used for cattle grazing. The survey team sampled this grassland vegetation with four BAM plots (BAM 1, 7, 8 and 12) to determine native vegetation extent and condition:

- Two smaller areas (total of 0.48 ha), in lower-lying areas with increased soil moisture, had comparatively higher occurrence of native species, predominantly *Juncus subsecundus* (40 % native veg cover, sampled with BAM Plot 8 and 12). This area was mapped as a separate Vegetation Zone and included in the further BAM analysis (Vegetation Zone 5 Wet exotic pasture).
- The bulk of the grassland area (44.02 ha) carried predominantly exotic pasture grasses, in particular Kikuyu **Cenchrus clandestinus* (< 5% native vegetation cover, sampled with BAM Plots 1 and 7). In a heavily disturbed landscape where the portion of native vegetation in an area is demonstrated to be less than 15%, the 'partially exotic ground cover guidance' applies (BAM 2020): all vegetation within this area can be considered exotic under the BOS. This guidance rule applies to the Subject Land for the area mapped as 'Vegetation Zone 6 Exotic pasture'. This Zone is therefore considered non-native vegetation for the purpose of this BDAR.

4.2 Plant community types

4.2.1 Plant Community Types overview

Three Plant Community Types (PCT) and eight distinct Vegetation Zones were identified across the Study Area (see **Figure 5 PCTs and Vegetation Zones in Study Area**). Six of these Vegetation Zones occur on the Subject Land. Detailed descriptions of each of the PCTs and Vegetation Zones are provided in the following subsections. The BAM plot data is provided in Appendix F (data) and Appendix G (photos).

Table 4-1 PCTs and Vegetation Zones identified within the Subject Land.

Zone ID	PCT ID	PCT name	Area on Subject Land
1	4050 Wetland shrubby	South Coast Floodplain Wetland Paperbark Scrub	0.13 ha
2	4050 Wetland	South Coast Floodplain Wetland Paperbark Scrub	1.14 ha
3	3183 Native pasture	Far South Hinterland Stringybark Sheltered Forest	0.19 ha
4	3332 Overstorey only	Southeast Lowland Grassy Woodland	0.07 ha
5	3332 Wet exotic pasture	Derived from Southeast Lowland Grassy Woodland	0.48 ha
6	3332 Exotic pasture	Derived from Southeast Lowland Grassy Woodland	44.02 ha

4.2.2 PCT identification

Table 4-2 Identification of PCT 4050 South Coast Floodplain Wetland Paperbark Scrub.

South Coast Floodplain Wetland Paperbark Scrub (PCT 4050)	
Vegetation formation: Forested Wetlands	
Vegetation class: Coastal Floodplain Wetlands	
Estimate of percentage cleared: 78.73%	
Conservation status: Associated with the TEC 'Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner' (BC Act) and 'Coastal Swamp Oak Forest of NSW and South East Queensland' (EPBC Act).	
Approximate extent within the Subject Land: 1.27 ha	
Condition types (Vegetation Zones) in the Study Area:	
Vegetation Zone 1: 4050 Wetland shrubby (BAM plot 5), 0.13 ha on the Subject Land	
Vegetation Zone 2: 4050 Wetland (BAM plots 2 and 6), 1.14 ha on the Subject Land	
Species relied upon for PCT identification, and relative occurrence of tree species:	
Upper stratum:	<i>Eucalyptus ovata</i> – 100 % (single native tree species present)
Mid stratum:	<i>Melaleuca ericifolia</i> – 100% (single native mid-stratum species present)
Ground covers:	<i>Carex appressa</i> <i>Carex gaudichaudiana</i> <i>Eleocharis acuta</i> <i>Isachne globosa</i>

Blechnum minus
Lythrum salicaria
Ranunculus indundatus
Hydrocotyle sibthorpioides

General description of PCT based on field assessment:

- PCT 4050 was assigned to the wetland community in the lower parts of the drainage lines close to Ferndale Lane where there would, prior to clearing, have been extensive strips of the 'Wolumla Creek soil landscape' (Tulau 1997), consisting of "moderately broad to narrow floodplains of Quaternary alluvium in granitic catchments, mostly gullied". Much of this soil landscape has been stripped out by gully erosion within the Bega Valley, but the subject site is located above one of the very few intact remnants of this soil landscape and its attendant wetland community, on a property immediately west of Ferndale Lane.
- Indicative species: The main indicator species are two Swamp Gums (*E. ovata*) in drainage lines close to Ferndale Lane, and a small patch of Swamp Paperbark (*Melaleuca ericifolia*) above one branch of the largest dam near the north-west corner of the site. Apart from these two species and an abundance of rushes (*Juncus spp.*) among the Kikuyu (**Cenchrus clandestinus*) in the lower parts of the gullies, there is very little of this wetland community remaining on the Subject Land.
- The closest fitting PCT for this vegetation community is PCT 4050 'South Coast Floodplain Wetland Paperbark Scrub'. It is noted that remnants of this plant community in the Wolumla area are in fact in the heads of small drainage lines rather than on the Bega River floodplain.
- Other PCTs shortlisted for this wetland community included:
 - PCT 4055 South Coast Upper Floodplain Wetland
 - PCT 4035 Far South Floodplain Wetland Paperbark Scrub



Zone 1: PCT 4050 Wetland shrubby



Zone 2: PCT 4050 Wetland

Table 4-3 Identification of PCT 3183 Far South Hinterland Stringybark Sheltered Forest

Far South Hinterland Stringybark Sheltered Forest (PCT 3183)	
Vegetation formation: Wet Sclerophyll Forest (Shrubby sub-formation)	
Vegetation class: South Coast Wet Sclerophyll Forests	
Estimate of percentage cleared: 0.52%	
Conservation status: The PCT is not associated with a Threatened Ecological Community.	
Approximate extent within the Subject Land: 0.19 ha	
Condition types (Vegetation Zones) in the Study Area:	
Vegetation Zone 3: 3183 Native pasture (BAM plot 3), 0.19 ha on the Subject Land	
Vegetation Zone 7: 3183 Regrowth forest (BAM plots 9 and 11), not occurring on the Subject Land	
Vegetation Zone 8: 3183 Forest (BAM plot 4), not occurring on the Subject Land	
Species relied upon for PCT identification, and relative occurrence of tree species in BAM plots:	
<i>Upper stratum:</i>	<i>Eucalyptus muelleriana</i> – 93% <i>Eucalyptus bosistoana</i> – 7%
<i>Mid stratum:</i>	<i>Pittosporum undulatum</i> <i>Acacia mearnsii</i> <i>Cassinia trinerva</i>
<i>Ground covers:</i>	<i>Indigofera australis</i> <i>Microlaena stipoides</i> <i>Sigesbeckia orientalis</i> <i>Glycine clandestina</i>
General description of PCT based on field assessment:	
- PCT 3183 was assigned to the forest community in the south-eastern part of the Study Area. This more elevated area carries the 'Yellowpinch soil landscape' (Tulau 1997) on Devonian sandstone and conglomerate, which is more abundant in the ranges to the south of Wolumla. - Indicative species: Yellow Stringybark (<i>E. muelleriana</i>), Coast Grey Box (<i>E. bosistoana</i>), Blue-leaved Stringybark (<i>E. agglomerata</i>), Silvertop Ash (<i>E. sieberi</i>), Maiden's Gum (<i>E. maidenii</i>), Mountain Grey Gum or Monkey Gum (<i>E. cypellocarpa</i>), Rough-barked Apple and a very occasional Red Bloodwood (<i>Corymbia gummifera</i>). The community is depauperate in shrubs, probably due to the long history of grazing by kangaroos and feral deer. - The wide variety of tree species present indicates that the vegetation on this part of the site is ecotonal, as might be expected in an area on a geological boundary. Some of the species more typical of this PCT also extend right down to the lowest parts of the Study Area and onto the western side of Ferndale Lane, off-site, indicating that the original vegetation may have been somewhat mixed in composition throughout the whole site. Remnant Forest Red Gums are also found close to Mine Lane in the elevated south-east corner of the site, adding to the impression that the two main vegetation communities identified (PCT 3332 and PCT 3183) are substantially intermixed across the Subject Land. Given the replacement of most of the understorey species by exotic pasture over much of the Subject Land, the remnant trees are really the only indicator species on which to base the mapping of the original vegetation. - Other PCTs shortlisted for this forest community included: - PCT 3452 Southeast Hinterland Dry Grassy Forest - PCT 3332 Southeast Lowland Grassy Woodland - PCT 3331 Southeast Gorge Dry Forest	



Zone 3: PCT 3183 Native pasture



Zone 7: PCT 3183 Regrowth forest

Table 4-4 Identification of PCT 3332 Southeast Grassy Woodland.

Southeast Lowland Grassy Woodland (PCT 3332)	
Vegetation formation: Grassy Woodlands	
Vegetation class: Coastal Valley Grassy Woodlands	
Estimate of percentage cleared: 83.18%	
Conservation status: Associated with the TEC 'Lowland Grassy Woodland' which is listed both in NSW (BC Act) and nationally (EPBC Act).	
Approximate extent within the Subject Land: 44.57 ha	
Condition types (Vegetation Zones) in the Study Area:	
Vegetation Zone 4: 3332 Overstorey only (BAM plot 10), 0.07 ha on the Subject Land	
Vegetation Zone 5: 3332 Wet exotic pasture (BAM plot 8 and 12), 0.48 ha on the Subject Land	
Vegetation Zone 6: 3332 Exotic pasture (BAM plots 1 and 7), 44.02 ha on the Subject Land	
Species relied upon for PCT identification, and relative abundance of tree species:	
Upper stratum: (scattered paddock trees)	<i>Eucalyptus tereticornis</i> – 41% <i>Eucalyptus muelleriana</i> – 27% <i>Angophora floribunda</i> – 12%

General description of PCT based on field assessment:

- PCT 3332 was assigned to the lower part of the grassland areas which is used for cattle grazing and make up the bulk of the Subject Land. The vegetation consists predominantly of exotic pasture grasses, in particular Kikuyu (**C. clandestinus*, 60–99% of the vegetation cover). Most of this lower part of the Subject Land is underlain by granitoid rocks of the Bega batholiths (two granitoid outcrop were seen on lower slope positions). This geology gives rise to what Tulau (1997) refers to as the ‘Bemboka soil landscape’, found on undulating to rolling low hills on granodiorite. This soil landscape is generally associated with PCT 3332 ‘Southeast Lowland Grassy Woodland’.
- From the preponderance of Forest Red Gum (*E. tereticornis*) and Rough-barked Apple (*A. floribunda*) among the retained old paddock trees in this lower part of the Subject Land it appears that this PCT was present in the area in the past. It has now been largely converted to exotic pasture with scattered trees.
- PCTs shortlisted for this forest community included:
 - PCT 3325 South Coast Valley Flats Ribbon Gum Forest
 - PCT 3183 Far South Hinterland Stringybark Sheltered Forest



Zone 5: PCT 3332 Overstorey only



Zone 6: PCT 3332 Wet exotic pasture

4.3 Threatened ecological communities

Two PCTs identified on the Subject Land, PCT 4050 and PCT 3332, are both associated with Threatened Ecological Communities (TEC) listed under the BC Act and EPBC Act. Each Vegetation Zone on the Subject Land was compared with key diagnostic characteristics for the relevant TECs, including distribution, elevation, vegetation characteristics and indicative species. Following advice from local expert botanist Jackie Miles, one additional candidate TEC, the 'River-flat Eucalyptus Forest on Coastal Floodplains', was checked for PCT 4050.

Based on observations in the field and BAM plot data, the survey team determined that none of the Vegetation Zones on site conform to the diagnostic criteria of the three candidate TECs (see **Table 4-5**).

Table 4-5 Summary of TEC status on the Subject Land for PCT 4050 and PCT 3332.

PCT	BC Act TEC	Characteristics met?	EPBC Act TEC	Characteristics met?
4050	'Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner'	No. The Subject Land is not on the coastal floodplain. The diagnostic species <i>Casuarina glauca</i> does not occur on site. Other characteristic groundcover and understorey species also do not occur.	'Coastal Swamp Oak (<i>C. glauca</i>) Forest of New South Wales and South East Queensland'	No. The Subject Land is not in a coastal catchment less than <50 m ASL. The vegetation on site lacks the key diagnostic species <i>C. glauca</i> .
4050	'River-flat Eucalyptus Forest on Coastal Floodplains of the North Coast, Sydney Basin and Southeast Corner'	No. The wetland vegetation has only one of the key diagnostic species (<i>E. ovata</i>) listed for this TEC.	'River-flat Eucalyptus forest on Coastal Floodplains of southern NSW and eastern Victoria'	No. The wetland vegetation does not have a crown cover of at least 20 %.
3332	'Lowland Grassy Woodland in the Southeast Corner Bioregion'	No. Diagnostic species are present as scattered trees, but understorey layers (small trees and shrubs) are absent, and groundcover is substantially replaced with exotic species. Also, the vegetation does not meet the criteria of >30 % understorey vegetative cover comprised of native species.	'Lowland Grassy Woodland in the Southeast Corner Bioregion'	No. The vegetation has considerably less than 30 % understorey vegetative cover comprised of native species.

4.4 Scattered paddock trees

Thirty-two living native paddock trees within the Subject Land meet the BAM 2020 definition of ‘scattered trees’. Fourteen of these trees will be removed as part of the proposal (see **Figure 7**, **Figure 8** and **Appendix B Scattered paddock trees**).

The fourteen scattered trees to be removed comprise a mixture of Forest Red Gum (*E. tereticornis*), Yellow stringybark (*E. muelleriana*), Rough-barked Apple (*A. floribunda*), Apple-topped Box (*E. angophorioides*) and Swamp Gum (*E. ovata*). The scattered trees are most likely remnant stems of two original PCTs identified on the Subject Land:

- PCT 3332: Twelve scattered trees (six Forest Red Gum, two Rough-barked Apple, two Yellow Stringybark, one Apple-topped Box, and one Swamp Gum) occur within areas on the lower slopes and flats in an area mapped as most likely formerly PCT 3332.
- PCT 4050: Two Swamp Gums occur along the roadside of Ferndale Lane within areas on the lower flats which most likely formed part of PCT 4050.

There are also seventeen scattered exotic trees on the Subject Land, including Peppercorn Trees (**Schinus mole*), Willows (**Salix sp.*), Pencil Pines (**Cupressus sp.*), and one Cape Chestnut (**Calodendrum capense*). Fifteen of these exotic trees will be removed as part of the proposal.

All paddock trees, native and exotic, were mapped in the field using GIS software on a handheld GPS. Trees were identified to genus and species, the DBH was recorded, and the trees were visually assessed to determine whether any hollows or nests were present. The native trees proposed to be cleared were assigned an assessment class relevant to the large tree benchmark of the PCT and the presence of visible cavities, including hollows, cracks and spouts (see **Table 4-6**). The biodiversity offset requirements were determined following the guideline provided in BAM 2020 Appendix B ‘Streamlined assessment module – scattered trees’.

Table 4-6 PCT and class of scattered native paddock trees proposed to be removed.

PCT and class of tree	Hollow-bearing tree?	No of trees to be removed
PCT 3332 Class 3 tree (≥ Large tree benchmark of 50 cm DBH)	Yes	10
	No	2
PCT 4050 Class 3 tree (≥ Large tree benchmark of 50 cm DBH)	Yes	2
	No	0

4.5 Vegetation zones and survey effort

Each of the three PCTs in the Study Area were stratified into zones with a similar broad condition state based on an assessment of the overstorey condition, understorey condition and observed land management practices. Eight vegetation zones were identified within the Study Area, and six of these occur on the Subject Land. These are described in **Table 4-7** and mapped in **Figure 5** and **Figure 6**. Nine vegetation integrity plots were conducted throughout the six vegetation zones. The survey effort was equal to or above the minimum plot requirements per zone area (BAM 2020).

Two of the vegetation zones identified in the Study Area, Zone 3 PCT 3181 Regrowth forest and Zone 8 PCT 3181, do not occur within the boundaries of the Subject Land and have been removed from further assessment.

Table 4-7 Vegetation zones on the Subject Land and survey effort.

Zone ID	PCT ID	Area on the Subject Land	Patch size class	No of BAM plots required	No of BAM plots completed
1	4050 Wetland shrubby A degraded wetland community with some understory vegetation (<i>Melaleuca ericifolia</i>) and one single tree (<i>E. ovata</i>). Moderate native species diversity.	0.13 ha	>100 ha	1	1 Plot 5
2	4050 Wetland A degraded wetland community with two individual trees (<i>E. ovata</i>). Very low native species diversity.	1.14 ha	>100 ha	1	2 Plots 2, 6
3	3183 Native pasture Native pasture with no canopy trees. Ground cover dominated by Kangaroo Grass (<i>Themeda triandra</i>). Low native species diversity.	0.19 ha	>100 ha	1	1 Plot 3
4	3332 Overstorey only Exotic pasture with an intact tree canopy of <i>E. tereticornis</i> and <i>A. floribunda</i> .	0.07 ha	>100 ha	1	1 Plot 10
5	3332 Wet exotic pasture Heavily grazed exotic pasture in lower-lying areas with some native rushes. Formerly PCT 3332.	0.48 ha	>100 ha	1	2 Plot 8, 12
6	3332 Exotic pasture Heavily grazed exotic pasture with scattered trees <i>E. tereticornis</i> and <i>A. floribunda</i> . Formerly PCT 3332. Scattered trees assessed separately under the BAM.	44.02 ha	>100 ha	0 Exotic pasture	2 Plot 1, 7

4.6 Vegetation integrity assessment results

The BAM plot data from Vegetation Zones 1– 5 (seven BAM plots) was entered into the BAM calculator (BAM-C) for vegetation integrity (VI) assessment. The VI assessment results are provided in **Table 4-8**. The BAM plot raw data is provided in Appendix F.

The BAM plot data from 'Vegetation Zone 7 3332 Exotic pasture' was not entered the BAM-C, as the vegetation in this Zone consisted of exotic grasses, predominantly Kikuyu (> 95% exotic grass cover).

Table 4-8 Vegetation integrity scores for each vegetation zone on the Subject Land.

Zone ID	PCT ID	Composition score	Structure score	Function score	Vegetation integrity score	Hollow bearing trees present?
1	4050 Wetland shrubby	45.9	71.9	52.2	55.7	No
2	4050 Wetland	18.2	20.5	9.1	15.1	Yes
3	3183 Native pasture	21.7	15.2	0	6.9	No
4	3332 Overstorey only	4	23	38.9	15.3	Yes
5	3332 Wet exotic pasture	12.8	44	4.1	13.2	No

5. HABITAT SUITABILITY FOR THREATENED SPECIES

5.1 Identification of threatened species for assessment

5.1.1 Ecosystem credit species

The BAM Calculator listed the following Candidate Ecosystem Credit Species for the development site.

Table 5-10 Ecosystem credit species derived from the BAM-C.

Common name	Scientific name	Listing status		Dual credit species	Sources	Retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within	Sensitivity to gain class
		BC Act	EPBC Act						
Regent Honeyeater (Foraging)	<i>Anthochaera phrygia</i>	CE	CE	Yes	BAM-C	Yes	-	Zone 4 3332 Overstorey only	High
Dusky Woodswallow	<i>Artamus cyanopterus cyanopterus</i>	V	-	No	BAM-C	Yes	-	Zone 1 4050 Wetland shrubby Zone 2 4050 Wetland Zone 3 3183 Native pasture Zone 4 3332 Overstorey only Zone 5 3332 Wet Exotic pasture	Moderate
Australasian Bittern	<i>Botaurus poiciloptilus</i>	E	E	No	BAM-C	Yes	-	Zone 1 4050 Wetland shrubby Zone 2 4050 Wetland	Moderate
Sanderling (Foraging)	<i>Calidris alba</i>	V	-	Yes	BAM-C	No	Habitat restricted to coastal areas	-	-
Red Knot (Foraging)	<i>Calidris canutus</i>	-	E	Yes	BAM-C	No	Habitat restricted to coastal areas	-	-
Curlew Sandpiper (Foraging)	<i>Calidris ferruginea</i>	E	CE	Yes	BAM-C	Yes	-	Zone 1 4050 Wetland shrubby Zone 2 4050 Wetland	High

Common name	Scientific name	Listing status		Dual credit species	Sources	Retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within	Sensitivity to gain class
		BC Act	EPBC Act						
Gang-gang Cockatoo (Foraging)	<i>Callocephalon fimbriatum</i>	V	E	Yes	BAM-C	Yes	-	Zone 1 4050 Wetland shrubby Zone 2 4050 Wetland Zone 3 3183 Native pasture Zone 4 3332 Overstorey only Zone 5 3332 Wet exotic pasture	Moderate
Glossy Black Cockatoo (Foraging)	<i>Calyptorhynchus lathami</i>	V	V	Yes	BAM-C	No	Habitat constraints: No <i>Allocasuarina</i> or <i>Casuarina</i> species present	N/A	High
Speckled Warbler	<i>Chthonicola sagittata</i>	V	-	No	BAM-C	Yes	-	Zone 4 3332 Overstorey only	High
Spotted Harrier	<i>Circus assimilis</i>	V	-	No	BAM-C	Yes	-	Zone 1 4050 Wetland shrubby Zone 2 4050 Wetland Zone 4 3332 Overstorey only Zone 5 3332 Wet exotic pasture	Moderate
Brown Treecreeper (eastern subspecies)	<i>Climacteris picumnus victoriae</i>	V	-	No	BAM-C	Yes	-	Zone 4 3332 Overstorey only	High
Varied Sittella	<i>Daphoenositta chrysoptera</i>	V	-	No	BAM-C	Yes	-	Zone 4 3332 Overstorey only	Moderate
Spotted-tailed Quoll	<i>Dasyurus maculatus</i>	V	E	No	BAM-C	Yes	-	Zone 1 4050 Wetland shrubby Zone 2 4050 Wetland Zone 3 3183 Native pasture Zone 4 3332 Overstorey only Zone 5 3332 Wet exotic pasture	High
Purple-crowned Lorikeet	<i>Glossopsitta porphyrocephala</i>	V	-	No	BAM-C	Yes	-	Zone 3 3183 Native pasture	
Little Lorikeet	<i>Glossopsitta pusilla</i>	V	-	No	BAM-C	Yes	-	Zone 4 3332 Overstorey only	High

Common name	Scientific name	Listing status		Dual credit species	Sources	Retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within	Sensitivity to gain class
		BC Act	EPBC Act						
White-bellied Sea Eagle (Foraging)	<i>Haliaeetus leucogaster</i>	V	-	Yes	BAM-C	Yes	-	Zone 1 4050 Wetland shrubby Zone 2 4050 Wetland Zone 3 3183 Native pasture Zone 4 3332 Overstorey only Zone 5 3332 Wet exotic pasture	High
Little Eagle (Foraging)	<i>Hieraaetus morphnoides</i>	V	-	Yes	BAM-C	Yes	-	Zone 1 4050 Wetland shrubby Zone 2 4050 Wetland Zone 3 3183 Native pasture Zone 4 3332 Overstorey only Zone 5 3332 Wet exotic pasture	Moderate
White-throated Needletail	<i>Hirundapus caudacutus</i>	-	V	No	BAM-C	Yes	-	Zone 1 4050 Wetland shrubby Zone 2 4050 Wetland Zone 3 3183 Native pasture Zone 4 3332 Overstorey only Zone 5 3332 Wet exotic pasture	High
Black Bittern	<i>Ixobrychus flavicollis</i>	V	-	No	BAM-C	No	Lack of dense vegetation around waterbodies	-	-
Swift Parrot (Foraging)	<i>Lathamus discolor</i>	E	CE	Yes	BAM-C	Yes	-	Zone 4 3332 Overstorey only	Moderate
Bar-tailed Godwit (baueri) (Foraging)	<i>Limosa lapponica baueri</i>	-	V	Yes	BAM-C	Yes	-	Zone 1 4050 Wetland shrubby Zone 2 4050 Wetland	High
Square-tailed Kite (Foraging)	<i>Lophoictinia isura</i>	V	-	Yes	BAM-C	Yes	-	Zone 1 4050 Wetland shrubby Zone 2 4050 Wetland Zone 3 3183 Native pasture Zone 4 3332 Overstorey only Zone 5 3332 Wet exotic pasture	Moderate

Common name	Scientific name	Listing status		Dual credit species	Sources	Retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within	Sensitivity to gain class
		BC Act	EPBC Act						
Hooded Robin (south-eastern form)	<i>Melanodryas cucullata cucullata</i>	V	-	No	BAM-C	Yes	-	Zone 1 4050 Wetland shrubby Zone 2 4050 Wetland Zone 3 3183 Native pasture	Moderate
Eastern Coastal Free-tailed Bat	<i>Micronomus norfolkensis</i>	V	-	No	BAM-C	Yes	-	Zone 4 3332 Overstorey only Zone 5 3332 Wet exotic pasture	High
Turquoise Parrot	<i>Neophema pulchella</i>	V	-	No	BAM-C	Yes	-	Zone 1 4050 Wetland shrubby Zone 2 4050 Wetland	High
Eastern Curlew (Foraging)	<i>Numenius Madagascariensis</i>	-	CE	Yes	BAM-C	Yes	-	Zone 1 4050 Wetland shrubby Zone 2 4050 Wetland	High
Olive Whistler	<i>Pachycephala olivacea</i>	V	-	No	BAM-C	Yes	-	Zone 3 3183 Native pasture	Moderate
Eastern Osprey (Foraging)	<i>Pandion cristatus</i>	V	-	Yes	BAM-C	Yes	-	Zone 1 4050 Wetland shrubby Zone 2 4050 Wetland Zone 3 3183 Native pasture Zone 4 3332 Overstorey only Zone 5 3332 Wet exotic pasture	Moderate
Yellow-bellied Glider	<i>Petaurus australis</i>	V	V	No	BAM-C	No	No overstorey vegetation	Zone 3 3183 Native pasture	High
Scarlet Robin	<i>Petroica boodang</i>	V	-	No	BAM-C	Yes	-	Zone 3 3183 Native pasture Zone 4 3332 Overstorey only Zone 5 3332 Wet exotic pasture	Moderate
Flame Robin	<i>Petroica phoenicea</i>	V	-	No	BAM-C	Yes	-	Zone 3 3183 Native pasture	Moderate
Golden-tipped Bat	<i>Phoniscus papuensis</i>	V	-	No	BAM-C	Yes	-	Zone 3 3183 Native pasture	High
Grey-headed Flying Fox (Foraging)	<i>Pteropus poliocephalus</i>	V	V	No	BAM-C	Yes	-	Zone 4 3332 Overstorey only	High

Common name	Scientific name	Listing status		Dual credit species	Sources	Retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within	Sensitivity to gain class
		BC Act	EPBC Act						
Pilotbird	<i>Pycnotptilus floccosus</i>	V	V	Yes	BAM-C	Yes	-	Zone 3 3183 Native pasture	Moderate
Diamond Firetail	<i>Stagonopleura guttata</i>	V	-	No	BAM-C	Yes	-	Zone 4 3332 Overstorey only Zone 5 3332 Wet exotic pasture	Moderate
Eastern Hooded Dotterel (Foraging)	<i>Thinornis cucullatus</i>	CE	V	No	BAM-C	Yes	-	Zone 3 3183 Native pasture	High
Rosenberg's Goanna	<i>Varauns rosenbergi</i>	V	-	No	BAM-C	Yes	-	Zone 1 4050 Wetland shrubby Zone 2 4050 Wetland	High

5.1.2 Species credit species

The BAM Calculator listed the following Candidate Species Credit Species for the development site.

Table 5-2 Candidate flora species credit species.

Common name	Scientific name	Listing status		Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within
		BC Act	EPBC Act				
Bega Wattle	<i>Acacia georgensis</i>	V	V	BAM-C	No	Geographic limitations: the site is not between Merimbula and Bermagui	-
Chef's Cap Correa	<i>Correa bauerlenii</i>	V	V	BAM-C	No	Geographic limitations: the site is not north of the Bega River	-

Common name	Scientific name	Listing status		Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within
		BC Act	EPBC Act				
Araluen Gum	<i>Eucalyptus kartzoffiana</i>	V	V	BAM-C	No	Geographic limitations: the site is not near Tuross River to the Araluen Valley	-
Hoary Sunray	<i>Leucochrysum albicans</i> subsp. <i>tricolor</i>	E	E	BAM-C	Yes	-	Zone 1 4050 Wetland shrubby Zone 2 4050 Wetland Zone 3 3183 Native pasture Zone 4 3332 Overstorey only Zone 5 3332 Wet exotic pasture
Yellow Loosestrife	<i>Lysimachia vulgaris</i> var. <i>davurica</i>	E	-	BAM-C	Yes	-	Zone 1 4050 Wetland shrubby Zone 2 4050 Wetland
Cotoneaster Pomaderris	<i>Pomaderris cotoneaster</i>	E	E	BAM-C	Yes	-	Zone 4 3332 Overstorey only
Austral Toadflax	<i>Thesium australe</i>	V	V	BAM-C	Yes	-	Zone 3 3183 Native pasture
Araluen Zieria	<i>Zieria adenophora</i>	CE	E	BAM-C	No	Habitat constraints: No rocky areas or granite outcrops of significance	-
Warty Zieria	<i>Zieria tuberculata</i>	V	V	BAM-C	No	Habitat constraints: Not within 15 km of Central Tilba, no rocky areas, no Monzonite outcrops	-

Table 5-3 Candidate fauna species credit species.

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within
		BC Act	EPBC Act					
Regent Honeyeater (Breeding)	<i>Anthochaera phrygia</i>	CE	CE	YES	BAM-C	No	Not as per Important Habitat Map	-
Bush Stone-Curlew	<i>Burhinus grallarius</i>	E	-	No	BAM-C	No	Habitat degraded. No fallen/standing dead timber including logs	-
Sanderling (Breeding)	<i>Calidris alba</i>	V	-	Yes	BAM-C	No	Not as per Important Habitat Map	-
Red Knot (Breeding)	<i>Calidris canutus</i>	-	E	Yes	BAM-C	No	Not as per Important Habitat Map	-
Curlew Sandpiper (Breeding)	<i>Calidris ferruginea</i>	E	CE	Yes	BAM-C	No	Not as per Important Habitat Map	-
Gang-gang Cockatoo (Breeding)	<i>Callocephalon fimbriatum</i>	V	E	Yes	BAM-C	Yes	-	Zone 4 3332 Overstorey only Scattered paddock trees
Glossy Black Cockatoo (Breeding)	<i>Calyptorhynchus lathami</i>	V	V	Yes	BAM-C	Yes	-	Zone 4 3332 Overstorey only Scattered paddock trees
Eastern Pygmy-possum	<i>Cercartetus nanus</i>	V	-	Yes	BAM-C	Yes	-	Zone 4 3332 Overstorey only
Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	V	V	No	BAM-C	No	Geographic limitations: site is not north of Bega River	-

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within
		BC Act	EPBC Act					
White-bellied Sea Eagle (Breeding)	<i>Haliaeetus leucogaster</i>	V	-	Yes	BAM-C	Yes	-	Zone 4 3332 Overstorey only Scattered paddock trees
Giant Burrowing Frog	<i>Heleioporus australiacus</i>	V	V	No	BAM-C	No	Habitat constraints: Habitat degraded, requires leaf litter	-
Little Eagle (Breeding)	<i>Hieraaetus morphnoides</i>	V	-	Yes	BAM-C	Yes	-	Zone 4 3332 Overstorey only Scattered paddock trees
Southern Brown Bandicoot (eastern)	<i>Isoodon obesulus obesulus</i>	E	E	No	BAM-C	No	Habitat constraints: habitat degraded, requires dense ground cover in a variety of habitats	-
Swift Parrot (Breeding)	<i>Lathamus discolor</i>	E	CE	Yes	BAM-C	No	Not as per Important Habitat Map	-
Bar-tailed Godwit (baueri) (Breeding)	<i>Limosa lapponica baueri</i>	-	V	Yes	BAM-C	No	Not as per Important Habitat Map	-
Green and Golden Bell Frog	<i>Litoria aurea</i>	E	V	No	BAM-C	Yes	-	Zone 1 4050 Wetland shrubby Zone 2 4050 Wetland Zone 3 3183 Native pasture Zone 4 3332 Overstorey only Zone 5 3332 Wet exotic pasture
Square-tailed Kite (Breeding)	<i>Lophoictinia isura</i>	V	-	Yes	BAM-C	Yes	-	Zone 4 3332 Overstorey only Scattered paddock trees
Stuttering Frog	<i>Mixophyes balbus</i>	E	V	No	BAM-C	No	Habitat constraints: Habitat degraded	-

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within
		BC Act	EPBC Act					
Southern Myotis	<i>Myotis macropus</i>	V	-	No	BAM-C	Yes	-	Zone 1 4050 Wetland shrubby Zone 2 4050 Wetland
Orange-bellied Parrot	<i>Neophema chrysogaster</i>	CE	CE	No	BAM-C	No	Geographic limitations: Not within 5 km of high water mark	-
Barking Owl (Breeding)	<i>Ninox connivens</i>	V	-	Yes	BAM-C	Yes	-	Zone 4 3332 Overstorey only Scattered paddock trees
Powerful Owl (Breeding)	<i>Ninox strenua</i>	V	-	Yes	BAM-C	Yes	-	Zone 4 3332 Overstorey only Scattered paddock trees
Eastern Curlew (Breeding)	<i>Numenius madagascariensis</i>	V	-	Yes	BAM-C	No	Not as per Important Habitat Map	-
Eastern Osprey (Breeding)	<i>Pandion cristatus</i>	V	-	Yes	BAM-C	No	Habitat constraints: No stick-nests in living and dead trees (>15 m) or artificial structures within 100 m of a floodplain for nesting.	-
Southern Greater Glider	<i>Petauroides volans</i>	E	E	No	BAM-C	No	Habitat degraded	-
Squirrel Glider	<i>Petaurus norfolcensis</i>	V	-	No	BAM-C	Yes	-	Zone 4 3332 Overstorey only
Brush-tailed Phascogale	<i>Phascogala tapoatafa</i>	V	-	No	BAM-C	No	Habitat constraints: absence of dense scrub layer and suitable understorey habitat	-

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within
		BC Act	EPBC Act					
Koala	<i>Phascogale cinereus</i>	E	E	No	BAM-C	Yes	-	Zone 4 3332 Overstorey only
Long-nosed Potoroo	<i>Potorous tridactylus</i>	V	V	No	BAM-C	No	Habitat constraints: Absence of dense scrub layer or alternatively high canopy cover exceeding 70%	-
Grey-headed Flying Fox (Breeding)	<i>Pteropus poliocephalus</i>	V	V	Yes	BAM-C	No	Habitat constraints: No breeding camps on site	-
Eastern Hooded Dotterel (Breeding)	<i>Thinornis cucullatus cucullatus</i>	CE	V	Yes	BAM-C	No	Geographic limitations: Coastal species. Occurs in near-coastal saline and freshwater lakes and lagoon, often with saltmarsh (OEH 2023)	-
Masked Owl (Breeding)	<i>Tyto novaehollandiae</i>	V	-	Yes	BAM-C	Yes	-	Zone 4 3332 Overstorey only Scattered paddock trees

5.1.3 Exclusions and inclusions based on habitat features and habitat quality

Exclusions: Eight candidate Species Credit Species were excluded from further assessment. Under Section 5.2.3 of the BAM, a candidate species credit species can be considered unlikely to occur on the Subject Land (or within specific vegetation zones) if following field assessment it is determined that the habitat is substantially degraded such that the species is unlikely to utilise the Subject Land (or specific vegetation zones). The excluded species are identified in **Table 5-4** along with justification regarding the habitat present.

Inclusions: No candidate species credits species were included based on habitat features or habitat quality.

Table 5-4 Candidate species credit species excluded based on lack of suitable habitat quality.

Species Credit Species	Habitat requirements	Reason for exclusion
Flora		
Araluen Zieria <i>Zieria adenophora</i>	Occurs in shrubland amongst large granite boulders and granite tors on a steep west facing hillsides. Currently known only from a single population of only 18 mature plants in 2020 south of Braidwood (OEH 2021).	Areas of suitable habitat does not occur within the Subject Land.
Fauna		
Bush Stone Curlew <i>Burhinus grallarius</i>	Intact ground cover vegetation with coarse woody debris. Feeds on insects and small vertebrates such a frogs, lizards and snakes (OEH 2017).	Lack of suitable ground cover vegetation, coarse woody debris and invertebrate and small vertebrate abundance within the Subject Land.
Giant Burrowing Frog <i>Heleioporus australiacus</i>	Breeding habitat: Heath, woodland and open dry sclerophyll forest with soaks or pools within first or second order streams. Also recorded from 'hanging swamp' seepage lines and where small pools form from the collected water. Non-breeding habitat: burrows below the soil surface in the forest leaf litter which can include areas of suitable habitat up to 300 m from breeding sites (OEH 2022).	Areas of suitable habitat does not occur within the Subject Land.
Watsons Tree Frog <i>Litoria watsoni</i>	Breeding habitat: Upper reaches of permanent streams and in perched swamps. Non-breeding habitat: Heathbased forests and woodlands where it shelters under leaf litter and low vegetation (OEH 2025).	Area of suitable habitat does not occur within the Subject Land
Stuttering Frog <i>Mixophyes balbus</i>	Breeding habitat: permanent streams in rainforest and wet, tall open forest. Non-breeding habitat deep leaf litter and thick understorey vegetation on the forest floor (OEH 2018).	Areas of suitable habitat does not occur within the Subject Land.
Orange-bellied Parrot	Foraging habitat: spends winter mostly within 3 km of the coast in sheltered coastal habitats including bays, lagoons, estuaries, coastal	Areas of suitable habitat does not occur within the Subject Land.

Species Credit Species	Habitat requirements	Reason for exclusion
<i>Neophema chrysogaster</i>	dunes and saltmarshes. Also inhabits small islands and peninsulas and occasionally saltworks and golf courses. Forage in low samphire herbland or taller coastal shrubland (OEH 2025)	
Southern Greater Glider <i>Petauroides volans</i>	Mature, undisturbed forests with connectivity and hollow-bearing trees. Requires large hollows for breeding and shelter (OEH 2022).	Areas of suitable habitat does not occur within the Subject Land.
Eastern Hooded Dotterel (Breeding) <i>Thiornis cucullatus cucullatus</i>	Hooded Plovers usually breed from August to March on sandy ocean beaches strewn with beachcast seaweed, in a narrow strip between the high-water mark and the base of the fore-dunes (OEH 2025).	Areas of suitable habitat does not occur within the Subject Land.

5.2 Presence of candidate species credit species

Further assessment was required for the following eighteen candidate Species Credit species:

Flora species: Hoary Sunray, Yellow Loosestrife, Cotoneaster Pomaderris, and Austral Toadflax.

Fauna species: Glossy Black Cockatoo (breeding habitat), Gang-gang Cockatoo (breeding habitat), White-bellied Sea-eagle (breeding habitat), Little Eagle (breeding habitat), Square-tailed Kite (breeding habitat), Barking Owl (breeding habitat), Powerful Owl (breeding habitat), Masked Owl (breeding habitat), Squirrel Glider, Brush-tailed Phascogale, Eastern Pygmy-possum, Koala, Southern Myotis and the Green and Golden Bell Frog.

5.3 Threatened species surveys

The following targeted surveys for eighteen candidate Species Credit Species were carried out following DPIE's taxa-specific survey guidelines with regards to timing of surveys, methods and survey effort. Species polygons are shown in **Figure 9 Threatened species polygons**. The following is a summary of the survey results. The full fauna survey reports and track logs are in provided in Appendix C and D.

1. Hoary Sunray

Survey method and timing: A systematic search for this species was undertaken on 22 November 2023 by an ecologist. The survey was conducted within the recommended Sep – April survey period (TBDC 2023). The identified species polygon within the Subject Land, Vegetation Zones 1–6, was surveyed using the 'parallel field traverse survey technique' following the NSW *Guide to surveying threatened plants and their habitat* (DPIE 2020). **Survey personnel:** Elisabeth Larsen, Senior Ecologist.

Results: No Hoary Sunray were recorded in the survey area. Hoary Sunray occurs outside the Bega Valley LGA on the Monaro, where it is patchily common on road verges, having preference for shallow soils with little competition with other vegetation. It was not detected in the Bega Valley in an extensive targeted survey held in 2002 of road verges in areas carrying suitable grassy woodland habitat (J. Miles, pers. obs.). Only the yellow flowered *L. albicans* subsp. *albicans* was recorded, in a

single location near Candelo. *L. albicans* subsp. *tricolor* is unlikely to occur in areas with a history of regular grazing such as the Subject Land.

2. Yellow Loosestrife

Survey methods: A systematic search for this species was undertaken on 5 December 2023 by an ecologist. The survey was conducted within the recommended Dec–March survey period (TBDC 2023). Within the Subject Land, Vegetation Zone 1 was surveyed using the ‘parallel field traverse survey technique’ following the NSW *Guide to surveying threatened plants and their habitat* (DPIE 2020). **Survey personnel:** Elisabeth Larsen, Senior Ecologist.

Results: No Yellow Loosestrife were recorded in the survey area. Yellow Loosestrife is a wetland species whose main area of occurrence is Wingecarribee Swamp in the Southern Highlands of NSW. One occurrence in the Bega Valley was recorded in 2002 (J. Miles, pers. obs.), on a large semi-permanent swamp on the Bega River floodplain. This location is on private property and has not been visited since, so it is not known if the species has persisted there. Its global distribution is in north-east Asia, and Australian occurrences are possibly natural introductions via migrating waterfowl. As such, it would need a wetland frequented by waterfowl to become established. On the Subject Land, the only remaining area of relatively undisturbed wetland habitat would barely meet this criterion, although the large dam on site is used by ducks and other waterbirds. In addition to the systematic search, the wetland area was also traversed several times in the process of completing a BAM plot. A similar looking species, *Lythrum salicaria*, occurs on site. However, the two species can easily be distinguished from *Lysimachia* on flower colour (yellow in *Lysimachia*, purple in *Lythrum*). There is no other suitable habitat on the Subject Land other than this one small wetland patch above the large dam in Vegetation Zone 1. The “wetlands” in Vegetation Zone 2 are too degraded to be likely habitat (J. Miles, pers.com.).

3. Cotoneaster Pomaderris

Survey methods: A systematic search for this species was undertaken on 22 November 2023 by an ecologist. The survey was conducted within the recommended Oct – Nov survey period (TBDC 2023). The identified species polygon within the Subject Land, Vegetation Zones 3 and 5, was surveyed using the ‘parallel field traverse survey technique’ following the NSW *Guide to surveying threatened plants and their habitat* (DPIE 2020). **Survey personnel:** Elisabeth Larsen.

Results: No Pomaderris Cotoneaster were recorded in the survey area. Locally this species is associated with rocky river beds and lower banks on Tantawangalo Creek. In other areas it may occur in elevated rocky areas which are not close to water, for example at Bungonia Gorge (J. Miles, pers. obs.). There is no such habitat on the Subject Land.

4. Austral Toadflax

Survey methods: A systematic search for this species was undertaken on 22 November 2023 by an ecologist. The survey was conducted within the recommended Nov – Feb survey period (TBDC 2023). The identified species polygon within the Subject Land, Vegetation Zone 4, was surveyed using the ‘parallel field traverse survey technique’ following the NSW *Guide to surveying threatened plants and their habitat* (DPIE 2020). **Survey personnel:** Elisabeth Larsen.

Results: No Austral Toadflax were recorded in the survey area. This species has been recorded twice in the Bega Valley, once on a road verge site and once on private property with a light grazing history, on both sites in association with good quality Kangaroo Grass (*Themeda triandra*) dominated

secondary grassland or grassy woodland (J. Miles, pers. obs.). It is very unlikely to occur in any areas with a history of regular grazing, such as the Subject Land.

5. Glossy-black Cockatoo

Survey methods and timing: Systematic visual searches of hollow-bearing trees for signs of use were completed in all treed areas within the Subject Land on 5 May 2023 within the survey window for this species, following the *Survey guidelines for Australia's threatened birds* (DEWHA 2010). Two further surveys were conducted on 28 December 2023 and 17 January 2024. No Glossy Black Cockatoos were seen by the survey teams during repeated site visits over 15 months (June 2022 – December 2023).

Survey personnel: Tony Hastings, Ecologist.

Results: No nest trees were found. See Appendix C for the survey report.

6. Gang-gang Cockatoo

Survey methods and timing: Systematic visual searches of hollow-bearing trees for signs of use were completed in all treed areas within the Subject Land on 28 December 2022 and 17 January 2023, following *Survey guidelines for Australia's threatened birds* (DEWHA 2010). Both surveys were conducted within the recommended October to January survey window for this species. No Gang-gang Cockatoos were seen by the survey teams during repeated site visits over 15 months (June 2022 – December 2023). **Survey personnel:** Tony Hastings, Ecologist.

Results: No nest trees were found. See Appendix C for the survey report.

7. Green and Golden Bell Frog

Survey methods and timing: Visual/aural surveys and tadpole searches were carried out after major rain events in suitable habitat on the Subject Land (streams and dams). Surveys were conducted in February and March 2023, within the recommended November to March survey window for this species (TBDC 2022). The survey techniques followed the guidelines of *NSW Survey Guide for Threatened Frogs* (DPIE 2020). **Survey personnel:** Sam Patmore, Ecologist.

Results: Not recorded in the Survey Area. See Appendix C for the survey report.

8. Southern Myotis

Survey methods and timing: Ultrasonic and acoustic surveys were carried out in suitable habitat on the Subject Land (close to a dam >3 m in width) using Anabat recording devices. Surveys were conducted in February and March 2023, within the recommended October to March survey window for this species (TBDC 2022). The survey techniques followed the guidelines of *NSW Species Credit bats and their habitats. NSW survey guide for the BAM method* (OEH 2018). **Survey personnel:** Sam Patmore, Ecologist.

Results: Presence confirmed in the survey area. See Appendix C for the survey report.

9. Eastern Pygmy Possum

Survey methods and timing: Camera trap and spotlighting surveys were carried in suitable habitat on the Subject Land (regrowth forest) in January and February, within the recommended survey months of October to March (TBDC 2022). The survey techniques followed the guidelines of *NSW Threatened biodiversity survey and assessment: Guidelines for developments and activities* (DEC 2004). **Survey personnel:** Tony Hastings, Ecologist.

Results: Not recorded in the survey area. See Appendix C for the survey report.

10. Squirrel Glider

Survey methods and timing: Camera trap and spotlighting surveys were carried in suitable forested habitat on the Subject Land (Vegetation Zones 3 and 5) in January and February, within the recommended survey months of September to January (TBDC 2022). The survey techniques followed the guidelines of *NSW Threatened biodiversity survey and assessment: Guidelines for developments and activities* (DEC 2004). **Survey personnel:** Tony Hastings, Ecologist.

Results: Presence confirmed in the survey area. See Appendix C for the survey report.

11. Brush-tailed Phascogale

Survey methods and timing: Camera trap and spotlighting surveys were carried in suitable forested habitat on the Subject Land (Vegetation Zones 3 and 5) in January and February, within the recommended survey months of December to June (TBDC 2022). The survey techniques followed the guidelines of *NSW Threatened biodiversity survey and assessment: Guidelines for developments and activities* (DEC 2004). **Survey personnel:** Tony Hastings, Ecologist.

Results: Not recorded in the survey area. See Appendix C for the survey report.

12. Koala

Survey methods and timing: A Spot Assessment Technique (SAT) survey (DPE 2022), spotlight surveys and bark scratches/scat searches were completed in suitable forest habitat, which is limited on the Subject Land to the remnant forest patch to the south-east (Vegetation Zones 3 and 5). The survey approach followed the guidelines and recommendations set out in SEPP 2021 (Koala Habitat Protection). **Survey personnel:** Tony Hastings, Ecologist.

Results: Not recorded in the survey area. Known 'Koala use tree' species were common in the survey area (Koala SEPP 2021). They included Yellow Stringybark, Silvertop Ash, Grey Box and Monkey Gum. However, no indications of Koala activity were detected during surveys, and there are no recent (< 18 year old) records of Koalas within 2.5 km of the Study Area. Based on these findings, Koalas are not considered to occur within the Subject Land, and it is very unlikely it occurs in the locality and Study Area. See Appendix C for the location of the spotlighting transects and the central SAT point tree.

13. Little Eagle

Survey method and timing: Visual nest tree searches were carried out in all treed areas within the Subject Land, including paddock and shelterbelt trees, in October 2023, within the recommended survey months of August to October (TBDC 2022). The survey techniques followed the guidelines of *Survey guidelines for Australia's threatened birds* (DEWHA 2010). No Little Eagles were seen by the survey teams during repeated site visits over 15 months (June 2022 – December 2023). **Survey personnel:** Tony Hastings, Ecologist.

Results: No nest trees were found. See Appendix C for the survey report.

14. Square-tail Kite

Survey method and timing: Visual nest tree searches were carried out in all treed areas within the Subject Land, including paddock and shelterbelt trees, in October 2023, within the recommended survey months of September to January (TBDC 2022). The survey techniques followed the guidelines of *Survey guidelines for Australia's threatened birds* (DEWHA 2010). No nest trees were found. No

Square-tail Kites were seen by the survey teams during repeated site visits over 15 months (June 2022 – December 2023). **Survey personnel:** Tony Hastings, Ecologist.

Results: No nest trees were found. See Appendix C for the survey report.

15. White-bellied Sea-eagle

Survey method and timing: Visual nest tree searches were carried out in all treed areas within the Subject Land, including paddock and shelterbelt trees, in October 2023, within the recommended survey months of July to December (TBDC 2022). The survey techniques followed the guidelines of *Survey guidelines for Australia's threatened birds* (DEWHA 2010). No nest trees were found. No White-bellied Sea Eagles were seen by the survey teams during repeated site visits over 15 months (June 2022 – December 2023). **Survey personnel:** Tony Hastings, Ecologist.

Results: No nest trees were found. See Appendix C for the survey report.

16. Powerful Owl

Survey methods and timing: Call playback and spotlighting surveys were carried out in August, September and October 2023 in suitable habitat (Vegetation Zones 3 and 5). This included surveys within the recommended survey months of May to August, plus additional surveys when juvenile birds could be detected. The survey techniques followed the guidelines of *Survey guidelines for Australia's threatened birds* (DEWHA 2010). **Survey personnel:** Tony Hastings, Ecologist.

Results: Presence confirmed in the survey area. An adult Powerful Owl was observed foraging in Vegetation Zone 8 on one survey occasion, and a juvenile Powerful Owl responded to the call playback and was sighted in Vegetation Zones 3, 5 and 8 on three survey occasions. See Appendix C for the survey report.

17. Barking Owl

Survey methods and timing: Call playback and spotlighting surveys were carried out in August, September and October 2023 in suitable habitat (Vegetation Zones 3 and 5), within the recommended survey months of May to December. The survey techniques followed the guidelines of *Survey guidelines for Australia's threatened birds* (DEWHA 2010). **Survey personnel:** Tony Hastings, Ecologist.

Results: Not recorded in the survey area. See Appendix C for the survey report.

18. Masked Owl

Survey methods and timing: Call playback and spotlighting surveys were carried out in August, September and October 2023 in suitable habitat (Vegetation Zones 3 and 5), within the recommended survey months of May to August. The survey techniques followed the guidelines of *Survey guidelines for Australia's threatened birds* (DEWHA 2010). **Survey personnel:** Tony Hastings, Ecologist.

Results: Not recorded in the survey area. See Appendix C for the survey report.

6. IDENTIFYING PRESCRIBED IMPACTS

Prescribed additional biodiversity impacts (prescribed impacts) are the impacts defined in clause 6.1 of the BC Regulation as ‘direct or indirect impacts that are additional to the impacts of native vegetation clearing.’ In general, prescribed impacts would include habitats or features of the environment that are irreplaceable. Impacts on identified prescribed impacts are addressed in 9.3 and 9.4 in this BDAR.

Table 6-1 Identification of prescribed impacts on the Subject Land.

Feature	Present	Description of feature characteristics and location	Potential impact	Threatened species or community using or dependent on feature
Karst, caves, crevices, cliffs, rocks or other geological features of significance	Limited resource	Six conglomerate boulders occur in the Study Area, one of these occur on the Subject Land, see Figure 7 and Photo 6-1	Disturbance to rock dependent species	None identified on the Subject Land
		Two small granitoid rocky outcrop occur in the Study Area, one of these occur on the Subject Land, see Figure 7 and Photo 6-2	Disturbance to rock dependent species	None identified on the Subject Land
Human-made structure	Yes	Farmhouse, sheds	Loss of potential roosting site for microbats	Potential roosting habitat for microbats
		Three 500 mm wide drainage culverts along Ferndale Lane, see Photos 6-4	Loss of potential roosting site for microbats	Potential roosting habitat for Southern Myotis
Non-native vegetation	Yes	Mature exotic trees: <i>*Schinus mole</i> , <i>*Pinus radiata</i> , <i>*Cupressus sp.</i>	Loss of potential roosting sites for microbats	Potential roosting habitat for microbats
Habitat connectivity	Limited resource	Scattered mature trees	Loss of potential nesting and roosting habitat	None identified on the Subject Land
Waterbodies, water quality and hydrological processes	Yes	Nine farm dams occur in the Study Area, six of these occur on the Subject Land, see Figure 7 and Photos 6-3. There are six 1 st order and three 2 nd order ephemeral streams in the Study Area.	Disturbance to large dam may threaten health of downstream riparian habitat	None identified on the Subject Land.
Vehicle strikes	Yes	New roads will be required for the development proposal. Existing access roads will be upgraded	Increased risk of vehicle strikes	None identified on the Subject Land

Photos 6-1 Two of the six conglomerate boulders in the Study Area.



Photo 6-2 Rocky outcrop on the Subject Land, south of Dam 1. One of two rocky outcrops in the Study Area.



Photos 6-3 Six dams on the Subject Land (refer to Figure 7 Habitat features).

Dam 1 - Large dam.



Dams 2, 3 and 4 (counter clockwise).



Dam 5.



Dam 6.



Photos 6-4 Three 500mm wide drainage culverts along Ferndale Lane.

Culvert 1: E 55749932, N 5920005



Culvert 2: E 55749886, N 5919808



Culvert 3: E 55749828, N 5919497



7. MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

An EPBC protected matters database search was undertaken on 3 December 2023 (10 km buffer of the proposal footprint) to identify Matters of National Environmental Significance (MNES) that have the potential to occur within the development site (see Appendix H). Those relevant to biodiversity include:

- Threatened Ecological Communities
- Threatened species
- Migratory species

The potential for these MNES to occur at the site is discussed below.

7.1 Threatened Ecological Communities

Five threatened ecological communities were returned from the MNES report. These are:

- Lowland Grassy Woodland in the South East Corner Bioregion
- Subtropical and Temperate Coastal Saltmarsh
- River-flat Eucalyptus Forest on Coastal Floodplains of Southern NSW and eastern Victoria
- Brogo Vine Forest of the South East Corner Bioregion
- Natural Temperate Grassland of the South Eastern Highlands

Two of these five TECs, 'Lowland Grassy Woodland' and 'River-flat Eucalyptus Forest on Coastal Floodplains', are associated with PCTs identified on the Subject Land: PCT 3332 Southeast Lowland Grassy Woodland and PCT 4050 South Coast Floodplain Wetland Paperbark Scrub.

However, PCT 3332 and PCT 4050, as they occur on the Subject Land, do not conform with key diagnostic criteria for the TECs, including those for distribution, elevation, vegetation characteristics and indicative species (see Section 4.3).

The proposal will not impact on any EPBC-listed Threatened Ecological Communities.

7.2 Threatened Species

Eighty-six candidate threatened species were returned in the EPBC Act database search in April 2025 (see **Appendix H Matters of National Significance**). The marine and shoreline specialists and were excluded from further assessment and potential habitat suitability was considered for the remaining forty-five species, comprising eighteen plant species, twelve bird species, nine mammal species, five frog species and one reptile species (see **Appendix I EPBC Act Habitat Assessment**).

On this background, the following five species were considered to have the potential to use the habitats at the development site:

- Austral Toadflax (*Thesium australe*)
- Tall Knotweed (*Persicaria elatior*)
- Hoary Sunray (*Leucochrysum albicans* subsp. *tricolor*)
- White-throated Needletail (*Hirundapus caudacutus*)
- Green and Golden Bell Frog (*Litoria laurea*)

Comprehensive field assessments of availability and quality of habitat in all seasons (June 2022 to December 2023, including periods of persistent wet weather), and targeted fauna surveys and systematic flora surveys were completed as part of this BDAR (see Section 5.3). None of the EPBC-listed species were detected in the surveys and none were considered likely to regularly occur or rely on the habitats present.

The proposal is unlikely to impact on any EPBC listed Threatened Species.

7.3 Migratory Species

Forty-two listed migratory species were returned in the EPBC Act database search in April 2025.

One of these species could occur on the site on occasion: the White-throated Needletail. However, this species is almost exclusively aerial and impacts are therefore considered unlikely.

The proposal is unlikely to impact on any EPBC listed Migratory Species.

STAGE 2: IMPACT ASSESSMENT

8. AVOID AND MINIMISE IMPACTS

8.1 Avoid and minimise impacts on native vegetation and habitat

8.1.1 Site selection

The Subject Land was selected as being a suitable for a subdivision development based on:

- The proposal is consistent with the objectives of the BVSC Draft Planning Proposal 'Residential Land Strategy – Increase Housing Diversity', in that it seeks to make efficient use of suitably zoned urban land and existing infrastructure and will contribute to the availability of new and diverse housing without undue environmental consequences.
- The Subject Land is identified in the BVSC Draft Wolumla Structure Plan as being part of the Wolumla urban release area, which comprises three separate land holdings.
- The proposal is compatible with the current land use zoning prescribed for the Subject Land under the provisions of the Bega Valley LEP (2013).
- The land is situated in a mostly cleared landscape with minimal native vegetation removal required.
- The vegetation within the development footprint has been subject to high disturbance levels.
- Proximity to the Wolumla village, Wolumla Public School and easy access to Bega and the coast via Princes Highway.
- The draft Wolumla Valley Estate proposal has been presented to the BVSC Development Advisory Panel on two separate occasions (30 June 2021 and 6 April 2023). At those meetings, Council staff indicated general support for the proposal, subject to further details being provided in the DA.

8.1.2 Proposal planning phase – detailed design

A preliminary biodiversity assessment was carried out in June 2022 to identify, map and review the native vegetation extent and condition and other ecological constraints on site. The survey included an assessment of all the scattered paddock trees on the Subject Land. The data provided in this preliminary assessment informed the design of the subdivision proposal.

In the proposed layout plan, the new lots are placed in already cleared areas in order to minimise native vegetation loss and edge effects.

After targeted surveys for threatened species detected Squirrel Glider and Powerful Owl in the remnant forest community to the south, the development footprint was further revised to avoid impact in this habitat. Two Vegetation Zones, PCT 3183 Vegetation Zone 7 Regrowth forest and Vegetation Zone 8 Sheltered forest, have been excluded from the Subject Land.

9. IMPACT ASSESSMENT

9.1 Unavoidable direct impacts

The construction and occupancy phases of the proposal will cause unavoidable direct impacts on biodiversity values. These direct impacts would occur as a result of direct clearing of vegetation for construction of buildings, roads and infrastructure, and the long-term occupancy of land.

The unavoidable direct impacts are summarised in **Table 9-1**.

Table 9-15 Summary of potential direct impacts to biodiversity.

Direct impact	Extent of direct impact	Frequency	Timing/duration	TEC, threatened species and habitats likely to be affected	Consequences
Clearing of native vegetation	Direct loss of: • 14 scattered paddock trees • 1.27 ha wetland vegetation • 0.48 ha wet exotic grassland • 0.19 ha of native pasture • 0.07 ha overstorey woodland	One-off event (Stages)	Construction (permanent impact)	Threatened species identified on the Subject Land: • Powerful Owl • Southern Myotis • Squirrel Glider	Direct loss of • 0.07 ha of Squirrel Glider habitat (overstorey woodland) • 0.07 ha of Powerful Owl habitat (overstorey woodland) • 1.27 ha of Southern Myotis habitat (native vegetation within 200 m of waterways with pools of >3 m wide).
Displacement of resident fauna	Direct loss of: • 44.02 ha exotic pasture • 1.27 ha wetland vegetation • 0.48 ha wet exotic grassland • 0.19 ha of native pasture • 0.07 ha overstorey woodland • Six dams • 14 scattered paddock trees • 15 scattered exotic trees	One-off event (Stages)	Construction (permanent impact)	Threatened species identified on the Subject Land: • Powerful Owl • Southern Myotis • Squirrel Glider	• Displacement of common ground dwelling and arboreal mammals, reptiles, native birds and other biota. • Loss of foraging habitat for the Squirrel Glider, Powerful Owl and Southern Myotis. • Loss of roosting habitat for birds • Temporary decline in local fauna populations.
Injury or death of fauna	Direct loss of: • 44.02 ha exotic pasture • 1.27 ha wetland vegetation • 0.48 ha wet exotic grassland • 0.19 ha of native pasture • 0.07 ha overstorey woodland • Six dams • 14 scattered paddock trees • 15 scattered exotic trees	One-off event (Stages)	Construction (permanent impact)	• Potential injury or death of threatened species as a result of clearing of hollow-bearing trees.	• Likely direct loss of small ground dwelling mammals (i.e. native mice and rats) and reptiles. These species are however mobile and are likely to vacate the development site into adjacent habitats. • Loss of native fauna will be mitigated during construction by the supervision of ecologists during all clearing activities.

9.1.1 Change in vegetation integrity score

The changes to vegetation integrity (VI) scores as a result of clearing are documented for each vegetation zone in **Table 9-2** below. The future VI score of zero is automatically assigned in BAM-C for areas of existing native vegetation assumed to be fully removed in preparation for roads, infrastructure, building envelopes, driveways, gardens, and Asset Protection Zones.

Table 9-2 Impacts to vegetation integrity.

Zone ID	PCT ID	Area (ha)	Before development				After development				Change in VI score
			Composition	Structure	Function	VI score	Composition	Structure	Function	VI score	
1	4050 Wetland shrubby	0.13	45.9	71.9	52.2	55.7	0	0	0	0	- 55.7
2	4050 Wetland	1.14	18.2	20.5	9.1	15.1	0	0	0	0	- 15.1
3	3183 Native pasture	0.19	21.7	15.2	0	6.9	0	0	0	0	- 6.9
4	3332 Overstorey only	0.07	4	23	38.9	15.3	0	0	0	0	- 15.3
5	3332 Wet exotic pasture	0.48	12.8	44	4.1	13.2	0	0	0	0	- 13.2

9.1.2 Loss of species credit species habitat

The loss of species credit species habitat as a result of clearing is documented in **Table 9-3** below.

Table 9-3 Summary of species credit species habitat loss on the Subject Land.

Species Credit Species	Biodiversity risk weighting	Area of habitat lost
Southern myotis (<i>Myotis macropus</i>)	High	PCT 4050 Wetland shrubby: 0.13 ha PCT 4050 Wetland: 1.14 ha
Powerful Owl (<i>Ninox strenua</i>)	High	PCT 3332 Overstorey only: 0.07 ha
Squirrel Glider (<i>Petaurus norfolcensis</i>)	High	PCT 3332 Overstorey only: 0.07 ha

9.1.3 Loss of scattered native paddock trees

The loss of scattered native paddock trees as a result of clearing is documented in **Table 9-4** below. An inventory of scattered native paddock trees on the Subject Land is provided in Appendix B.

Table 9-4 PCT and Class of scattered native paddock trees proposed to be removed.

PCT and class of tree	Hollow-bearing tree?	No of trees to be removed
PCT 3332 Class 3 tree (≥ Large tree benchmark of 50 cm DBH)	Yes	10
	No	2
PCT 4050 Class 3 tree (≥ Large tree benchmark of 50 cm DBH)	Yes	2
	No	0

9.2 Potential indirect impacts

Indirect impacts of the proposal could include soil and water contamination of adjacent vegetation, the effects of barriers to fauna movement, the effects of the generation of excessive dust, light or noise during the construction phase, and future indirect impacts resulting from the permanent residential occupancy of the land. Section 8.2 of the BAM identifies the specific indirect impacts that must be considered. **Table 9-5** reviews the type, frequency, intensity, duration and consequence of the indirect impacts that may occur as a consequence of the proposal.

A strip of native vegetation occurs along Ferndale Lane, outside of the Subject Land (Road Reserve). This vegetation may suffer indirect impacts, such as windthrow, compaction, or later proposal to clear for asset protection, road access, or other. The vegetation has been assessed, with no threatened species or communities found. One mature tree occurs here, which will be removed as part of the proposal. The offset requirement associated with the direct loss of this tree, a Swamp Gum (Habitat tree no. 78, PCT 4050) has been accounted for in this BAM assessment (Section 9.1.3 and Section 11.2 in this report).

Table19-5 Potential indirect impacts to biodiversity.

Nature of indirect impact	Areas at risk	Frequency	Timing/duration	TEC, threatened species and habitats likely to be affected	Potential consequence on biodiversity values
Inadvertent impact on adjacent habitat or vegetation	- Downstream riparian zones, wetland areas and waterways to the west of the Study Area - Retained paddock trees within the Subject Land - Area of remnant PCT 3183 Forest to the south of the project footprint within the Study Area - Forest communities to the east and south of the Study Area	Ongoing	Construction (short term) Residential occupation (long-term)	- Threatened species habitat in adjacent forest communities - Downstream wetland habitat	- Degradation of downstream riparian zones, wetland areas and waterways (run-off, contaminant spills, increased sedimentation) - Loss of connectivity, roosting and nesting habitat - Increase in weeds, pests and predator encroachment into adjoining vegetation - Decline in viability of native flora and fauna habitat
Reduced viability of adjacent habitat due to edge effects	Approximately 600 m of edges to the east, south and west of the Subject Land boundary	Ongoing	Construction (short term) Residential occupation (long-term)	- Adjacent forest communities - Downstream wetland habitat	- Weed encroachment into adjoining vegetation - Increased predation risk for native fauna (domestic dogs, cats, foxes)
Reduced viability of adjacent habitat due to noise, dust or light spill	- Downstream riparian zones, wetland areas and waterways - Area of remnant PCT 3183 Forest to the south of the project footprint within the Study Area - Retained scattered paddock trees - Forest communities to the east and south of the Study Area	Ongoing	Construction (short term) Residential occupation (long-term)	- Adjacent forest communities - Downstream wetland habitat	- Disturbance of nocturnal fauna due to light pollution from construction work and ongoing residential occupation - Decline in viability of adjacent habitat due to noise and dust pollution from construction and ongoing residential occupation
Transport of weeds and pathogens from the site to adjacent vegetation	- Downstream riparian zones, wetland areas and waterways - Area of remnant PCT 3183 Forest to the south of the project footprint within the Study Area - Retained scattered paddock trees	Ongoing	Construction (short term) Residential occupation (long-term)	- Downstream wetland habitat - Adjacent forest communities	- Habitat degradation caused by spread of weeds and pathogens (e.g. <i>Phytophthora cinnamomi</i>) - Increase in sedimentation and pollution of downstream riparian zones and waterways

Nature of indirect impact	Areas at risk	Frequency	Timing/duration	TEC, threatened species and habitats likely to be affected	Potential consequence on biodiversity values
	Forest communities to the east and south of the Study Area				
Increased risk of starvation or exposure, and loss of shade or shelter	N/A	N/A	N/A	N/A	Negligible – existing habitat is already highly modified
Loss of breeding habitat	- Downstream riparian zones, wetland areas and waterways - Area of remnant PCT 3183 Forest to the south of the project footprint within the Study Area - Retained scattered paddock trees - Forest communities to the east and south of the Study Area	Ongoing	Construction (short term) Residential occupation (long-term)	- Adjacent forest communities - Downstream wetland habitat	- Reduced viability of breeding habitat in adjoining vegetation due to habitat degradation - Loss of breeding habitat on site (paddock trees)
Trampling of threatened flora species	- Downstream riparian zones, wetland areas and waterways - Area of remnant PCT 3183 Forest to the south of the project footprint within the Study Area. - Forest communities to the east and south of the Study Area	Possible	Construction (short term) Residential occupation (long-term)	- Adjacent forest communities - Downstream wetland habitat	Although no threatened flora species were identified within the Subject Land, presence within adjoining vegetation communities cannot be ruled out
Inhibition of nitrogen fixation and increased soil salinity	N/A	N/A	N/A	N/A	None – Subject Land is not within salt susceptible land
Fertiliser drift	Retained paddock trees within the Subject Land	Ongoing	Residential occupation (long-term)	Downstream wetland habitat	Decline and potential loss of retained trees on site

Nature of indirect impact	Areas at risk	Frequency	Timing/duration	TEC, threatened species and habitats likely to be affected	Potential consequence on biodiversity values
	Downstream riparian zones, wetland areas and waterways				- Reduction of habitat quality in adjoining vegetation - Degradation of downstream riparian zones, wetland areas and waterways - Alteration to species composition in adjoining habitat
Rubbish dumping	- Downstream riparian zones, wetland areas and waterways - Area of remnant PCT 3183 Forest to the south of the project footprint within the Study Area - Retained paddock trees within the Subject Land - Forest communities to the east and south of the Study Area	Ongoing	Residential occupation (long-term)	- Adjacent forest communities - Downstream wetland habitat	Reduced viability of adjacent habitat
Wood collection	Forest communities to the east and south of the Study Area	Occasional	Residential occupation (long-term)	- Adjacent forest communities - Downstream wetland habitat	Loss of habitat structure and associated loss of biodiversity; microorganisms, invertebrates, frogs, small mammals, reptiles, small birds
Removal and disturbance of rocks, including bush rocks	Forest communities to the east and south of the Study Area	Occasional	Construction (short term) Residential occupation (long-term)	- Adjacent forest communities - Downstream wetland habitat	Removal of bush rock reduce the availability of habitat for small native fauna, primarily reptiles. Very limited resource within the Subject Land, however likely to occur in the broader landscape.
Increase in predators	- Downstream riparian zones and wetland areas - Area of remnant PCT 3183 Forest	Ongoing	Residential occupation (long-term)	- Adjacent forest communities - Downstream wetland habitat	Increased predation by domestic pets (cats, dogs), feral cats and foxes

Nature of indirect impact	Areas at risk	Frequency	Timing/duration	TEC, threatened species and habitats likely to be affected	Potential consequence on biodiversity values
	to the south of the project footprint within the Study Area Forest communities to the east and south of the Study Area				Reduced viability of adjacent habitat
Increase in pest animal populations	- Downstream riparian zones and wetland areas - Area of remnant PCT 3183 Forest to the south of the project footprint within the Study Area - Forest communities to the east and south of the Study Area	Ongoing	Residential occupation (long-term)	Adjacent forest communities	- Increased populations of feral cats, rabbits and other vertebrate pests, e.g. the Common Myna (<i>Acridotheres tristis</i>) - Reduced viability of adjacent habitat
Increased risk of fire	- Area of remnant PCT 3183 Forest to the south of the project footprint within the Study Area - Forest communities to the east and south of the Study Area	Ongoing	Residential occupation (long-term)	Adjacent forest communities	Increased risk of human-caused ignition
Disturbance to specialist breeding and foraging habitat	N/A	N/A	N/A	N/A	N/A - No specialist habitat identified

9.3 Potential prescribed impacts

Table 9-6 Potential prescribed biodiversity impacts.

Feature	Nature of feature	Nature of impact	Frequency	Timing/duration	Potential consequence on threatened entities or their habitat	Potential consequence on biodiversity values
Karst, caves, crevices or cliffs	Do not occur on the Subject Land	N/A	N/A	N/A	N/A	N/A
Rocks	One boulder and one rocky outcrop	Boulders will be relocated to the drainage reserves Rocky outcrop will be retained <i>in situ</i> or relocated to drainage reserves	One-off	Construction	No threatened entities associated with rocky habitat identified on the Subject Land	Negligible and temporary impact. Boulders and rocks will remain on the Subject Land
Human-made structure	Old farm buildings and sheds	Will be removed	One-off	Construction (permanent impact)	Loss of potential roosting site for threatened microbats	Loss of potential roosting and nesting sites for microbats and common birds
Non-native vegetation	Exotic paddock trees	Loss of 15 scattered exotic trees	One-off	Construction (permanent impact)	N/A	Loss of potential roosting and nesting sites for microbats and birds
Habitat connectivity	Limited to scattered paddock trees	Loss of 15 scattered exotic trees Loss of 14 scattered native trees	One-off	Construction (permanent impact)	General decline in connectivity in the wider landscape	- Decline in available foraging, roosting, nesting and shelter habitat - Loss of connectivity in the wider landscape
Waterbodies, water quality, hydrological processes	Six farm dams, four 1 st order and three 2 nd order drainage lines	Direct loss of five smaller farm dams. Modification of one dam (large dam) and loss of associated	One-off	Construction (permanent impact)	Reduction in available foraging habitat for the Southern Myotis	- Decline in available foraging and nesting habitat for wetland species - Modification of large dam may threaten downstream riparian

Feature	Nature of feature	Nature of impact	Frequency	Timing/duration	Potential consequence on threatened entities or their habitat	Potential consequence on biodiversity values
		riparian vegetation (PCT 4050 wetland)				zones, wetland areas and waterways
Vehicle strikes	Increased traffic	New roads are required for the subdivision development Existing access roads will be upgraded	Ongoing	Construction and residential occupation (ongoing, long-term)	N/A	Increased risk of vehicle strikes

9.4 Mitigate and manage impacts on biodiversity values

Mitigation measures proposed to manage impacts, including proposed techniques, timing, frequency, responsibility for implementing each measure, risk of failure, and an analysis of the consequences of any residual impacts are provided in **Table 9-7**.

Table 9-7 Mitigation measures to avoid and minimise impacts on biodiversity values.

Mitigation measure	Proposed technique	Timing	Frequency	Responsibility	Risk of failure	Risk and consequence of residual impact
Displacement of resident fauna through vegetation clearing and habitat removal						
Staff training and site briefings	Toolbox talks: all construction staff to be inducted on measures to prevent impacts on biodiversity values	Prior to and during construction	Regularly	Construction contractor	Low	Disturbance or loss of native vegetation and habitat if training is not carried out or followed
Timing of vegetation clearing and habitat removal	All vegetation clearing works and removal/ modification of dams to be undertaken in late autumn-early winter to minimize	Autumn-winter	Regularly	Construction contractor	Moderate	- Disruption of critical life cycle events - Risk of death or injury to fauna

Mitigation measure	Proposed technique	Timing	Frequency	Responsibility	Risk of failure	Risk and consequence of residual impact
	disturbance of the breeding and nursing cycles of local fauna					
Pre-clearing and post-clearing fauna surveys by ecologist. Ecologist on site during tree clearing and other habitat removal events	• Prepare and implement a Nestbox Plan to mitigate the loss of hollows. • Removal of habitat (vegetation, dams, human-made structures) to be supervised by ecologist or trained fauna spotter/ catcher to allow for fauna to be rescued and relocated	Construction	Regularly	Construction contractor	Moderate	• Risk of death or injury to fauna
Relocation of habitat features (fallen timber, hollow logs, boulders and rocks) to protected habitat in the Study Area	• Boulders and rocks, woody debris and hollow logs to be relocated under the supervision of an ecologist to adjacent and protected habitat. Fauna to be relocated if possible	Construction	Regularly	Construction contractor	Low	• Risk of death or injury to fauna from inability to relocate to suitable habitat, exposure or predation
Protect and maintain exclusion areas ('no-go zones')	• Clearly mark boundaries of approved impact areas with temporary fencing or similar prior to construction work commencing • No parking, stockpiling or storage of topsoil or fill within dripline of any trees, riparian buffers or other 'no-go zones' • Avoid night work to prevent accidental impact outside marked boundaries	Prior to and during construction	Regularly	Construction contractor	Moderate	• Risk of inadvertent clearing or disturbance of trees and native vegetation to be retained
Indirect impacts on native vegetation and habitat						

Mitigation measure	Proposed technique	Timing	Frequency	Responsibility	Risk of failure	Risk and consequence of residual impact
Staff training and site briefings	Toolbox talks: All construction staff to be inducted on measures to prevent indirect environmental impacts	Prior to and during construction	Regularly	Construction contractor	Low	Disturbance or loss of native vegetation and habitat if training is not carried out or followed
Protect and maintain exclusion areas ('no-go zones')	- Exclusion areas ('no-go zones') to be clearly delineated with temporary fencing or similar prior to construction work commencing - No parking, stockpiling or storage of topsoil or fill within dripline of any trees, riparian buffers or other 'no-go zones'	Pre-construction Construction	Regularly	Construction contractor	Moderate	Degradation of surrounding vegetation and habitat values
Weed and pathogen hygiene controls, topsoil and vegetation management	- Prepare and implement a <i>Vegetation Management Plan</i> - Vehicle hygiene and weed quarantine measures must be put in place for all machinery entering and leaving the site including washing down of vehicles to avoid dispersion of new weed seed onto the property and to other sites - Seek advice from BVSC on the control and management Fireweed and African Lovegrass and other High Threat Weeds occurring on site - Seek advice on local indigenous species for landscaping - Plan for the rehabilitation and revegetation of retained riparian zones and reserves	Planning Construction Residential occupation	Prior to start of work	Developer Construction contractor	Low risk if plan is implemented	- Risk of introducing new weeds and plant diseases into the area. - Risk of spread of inappropriate species to adjoining native vegetation

Mitigation measure	Proposed technique	Timing	Frequency	Responsibility	Risk of failure	Risk and consequence of residual impact
Sediment control: Avoid indirect impacts on waterways, including siltation of the wetland to the west of the site and all associated drainage lines and gullies	• Prepare and implement a <i>Soil and Water Management Plan</i> • Erosion and sediment control measures to be installed prior to start of works • Implement sediment barriers and spill management procedures to control the quality and volume of water release and runoff • Monitor the wetland prior to works, during and after excavation works to ensure controls are adequate and water quality is not compromised • All controls to remain in place and in proper working order until a long-term rehabilitation solutions are achieved (i.e. soil stabilization or revegetation)	Planning Construction Residential occupation	Prior to start of work	Developer Construction contractor	Low risk if plan is implemented	• Risk of soil erosion, sediment transport and contamination of downstream riparian zones, wetland areas and waterways • Excessive discharge of water into waterways may alter hydrological patterns
Noise: Limit construction and operational activities (day/season) to minimise impacts of noise	• Limit construction work to daytime only	Construction	Regularly	Developer Construction contractor	Low	• Decline in habitat viability for nocturnal fauna • Disruption of critical life cycle events
Light spills: Limit construction and operational activities (day/season) to minimise impacts of light spills	• Design subdivision street lighting which minimises light spill • Avoid night work • Direct lights away from vegetation/ habitat	Planning Construction Residential occupation	Regularly	Developer Construction contractor	Low	• Decline in habitat viability for nocturnal fauna • Disruption of critical life cycle events

Mitigation measure	Proposed technique	Timing	Frequency	Responsibility	Risk of failure	Risk and consequence of residual impact
Dust: Set in place adaptive dust monitoring programs to control air quality	- All activities to be undertaken with the objective of preventing dust emissions from the development site - Daily dust monitoring and implementation of control measures if required - Construction to stop until control measures are implemented	Construction	Regularly	Construction contractor	Moderate	- Build-up of dust on vegetation and within waterways - Sedimentation of dams and open water bodies
Prescribed biodiversity impacts						
Staff training and site briefings	Toolbox talks: All construction staff to be inducted on measures to prevent prescribed environmental impacts	Prior to and during construction	Regularly	Construction contractor	Low	Disturbance or loss of native vegetation and habitat if training is not carried out or followed
Road and culvert design	- Design of road and culverts to emulate current stream grade and flow patterns - New culverts to allow use by microbats	Planning Construction	Prior to start of work	Developer	Low	- Altered hydrological processes - Loss of potential roosting habitat for the Southern Myotis
Sediment barriers and spill management procedures to control the quality of water runoff released from the site into the receiving environment	Prepare and implement a <i>Soil and Water Management Plan</i>	Planning Construction	Regularly	Developer Construction contractor	Moderate	- Risk of soil erosion, sediment transport and contamination of downstream riparian zones, wetland areas and waterways - Excessive discharge of water into waterways may alter hydrological patterns
Timing of prescribed impact	Removal or modification of culverts, dams, housing and other human-made structures to be undertaken in late autumn-early winter to minimize disturbance of	Construction	Regularly	Construction contractor	Moderate	- Disruption of critical life cycle events - Risk of death or injury to fauna

Mitigation measure	Proposed technique	Timing	Frequency	Responsibility	Risk of failure	Risk and consequence of residual impact
	the breeding and nursing cycles of fauna					
Fauna surveys by Ecologist prior to and post-construction work Presence by Ecologist during habitat removal and/or modification	Removal of habitat (scattered native and exotic trees, culverts, human-made structures) and relocation of habitat (boulders and rocks) to be supervised by ecologist	Construction	Regularly	Construction contractor	Moderate	Risk of death or injury to fauna
Communicate risk of traffic strikes during staff training and construction site briefings	Site speed limits to be enforced to minimise fauna strike	Construction	Regular	Construction contractor	Moderate	Fauna strikes from vehicles
Install temporary fencing to protect vegetation and fauna habitat adjoining the Subject Land.	Exclusion fences and signage to be installed prior to construction commencing	Construction	Regular	Construction contractor	Moderate	Fauna strikes from vehicles

9.5 Adaptive management strategy

Adaptive management during construction and operation will be receptive to any new and relevant data that may arise through ongoing assessment and monitoring and is key to the successful implementation of the relevant management plans. This will allow ongoing flexibility to manage objectives, allow for relevant feedback and modifications.

Construction management plans will contain management plans for flora and fauna, which will have an adaptive management component. This includes measures to monitor predicted impacts of vehicle strikes, thresholds for species mortality based on relevant literature, which will trigger adaptive management actions, and any measures proposed to mitigate potential impacts.

10. SERIOUS AND IRREVERSIBLE IMPACTS

The principles used to determine if a development will have serious and irreversible impacts, include impacts that:

- will cause a further decline of the species or ecological community that is currently observed, estimated, inferred, or reasonably suspected to be in a rapid rate of decline, or
- will further reduce the population size of the species or ecological community that is currently observed, estimated, inferred, or reasonably suspected to have a very small population size, or Impact on the habitat of a species or ecological community that is currently observed, estimated, inferred, or reasonably suspected to have a very limited geographic distribution, or
- impact on a species or ecological community that is unlikely to respond to measures to improve habitat and vegetation integrity and is therefore irreplaceable.

The following was determined for the Subject Land:

- **Threatened Ecological Communities:** There are no mapped TECs on the Subject Land.
- **Threatened species:** There are no SAI candidate species recorded on the Subject Land.
- **Additional potential entities:** No further species were considered to be potential SAI entities.

11. BIODIVERSITY OFFSET REQUIREMENTS

11.1 Ecosystem credits

An offset is required for all impacts of development on PCTs that are associated with:

- a vegetation zone that has a vegetation integrity score ≥ 15 where the PCT represents an endangered or critically endangered ecological community, or
- a vegetation zone that has a vegetation integrity score of ≥ 17 where the PCT is associated with threatened species habitat (as represented by ecosystem credits), or a vulnerable ecological community, or
- a vegetation zone that has a vegetation integrity score ≥ 20 where the PCT **does not** represent a threatened ecological community and is not associated with threatened species habitat.

An offset is not needed for impacts on native vegetation if the vegetation integrity score is below those listed above.

Relevant to this proposal, the PCTs and vegetation zones requiring offsets, and the ecosystem credits required, are shown in **Table 11-1**. The vegetation zones are mapped on **Figure 10 Impacts requiring an offset**. None of the vegetation to be cleared meet the definition of any listed Threatened Ecological Communities.

Table 11-1 Ecosystem credits for impacts on native vegetation.

PCT Name	Vegetation zone ID	Zone area (ha)	Vegetation integrity score	Vegetation integrity loss	Ecosystem credits required
4050 South Coast Floodplain Wetland Paperbark Scrub	4050 Wetland shrubby	0.13	55.7	55.7	4
	4050 Wetland	1.14	15.1	15.1	0
3183 Far South Hinterland Stringybark Sheltered Forest	3183 Native pasture	0.19	6.9	6.9	0
3332 Southeast Lowland Grassy Woodland	3332 Overstorey only	0.07	15.3	15.3	0
	3332 Wet exotic pasture	0.48	13.2	13.2	0
Total ecosystem credits:					
4050 South Coast Floodplain Wetland Paperbark Scrub					4

The Biodiversity Credit Report generated by the BAM Calculator is provided in Appendix A.

11.2 Ecosystem credits for scattered trees

An offset is required for the loss of scattered native paddock trees. These trees and the ecosystem credits are listed in **Table 11-2**.

Table 11-2 Ecosystem credits for the loss of scattered paddock trees.

PCT and class of tree (BAM Appendix B)	No of trees	Hollow-bearing tree	Credit offset per tree	Number of ecosystem credits required
PCT 3332 Class 3 tree (≥ Large tree benchmark of 50 cm DBH)	10	Yes	1	10
	2	No	0.75	2
PCT 4050 Class 3 tree (≥ Large tree benchmark of 50 cm DBH)	2	Yes	1	2
Total ecosystem credits for scattered trees:				
PCT 3332 Southeast Lowland Grassy Woodland				12
PCT 4050 South Coast Floodplain Wetland Paperbark Scrub				2

11.3 Species credits

An offset is required for the threatened species impacted by the development that require species credits. These species and the species credits are listed in **Table 11-3**.

Table 11-3 Species credits for impacts on threatened species.

Species credit species	Biodiversity risk weighting	Area of habitat lost	Species credits required
Southern Myotis <i>Myotis macropus</i>	2	1.14 ha (4050 Wetland)	9
		0.13 ha (4050 Wetland shrubby)	4
Powerful Owl <i>Ninox strenua</i>	2	0.07 ha (3332 Overstorey only)	1
Squirrel Glider <i>Petaurus norfolcensis</i>	2	0.07 ha (3332 Overstorey only)	1
Total species credits:			
Southern Myotis			13
Powerful Owl			1
Squirrel Glider			1

11.4 Areas not requiring an offset

The three vegetation zones 'PCT 4050 Wetland', 'PCT 3183 Native pasture', 'PCT 3332 Overstorey only' and 'PCT 3332 Wet exotic pasture' do not require offsetting, as the VI scores for these four vegetation zones were below the VI thresholds listed in Section 9.1.

11.5 Offsets under the EPBC Act

No threatened entities listed under the EPBC Act have been identified as having the potential to be impacted by the development. As such, the proposal is not considered to require offsets in accordance with the EPBC Offsets Policy.

12. CONCLUSION

This Biodiversity Development Assessment Report was prepared by Local Environmental Solutions on behalf of the proponent, Junor Investments Pty Ltd, for a proposed subdivision of Lot 2 DP1287077, Wolumla, NSW 2550, in the Bega Valley Shire Local Government Area.

Comprehensive mapping and field surveys were completed in accordance with the requirements of the BAM to identify credit obligations under the BOS. It was determined that the proposed clearing of 0.13 ha of wetland vegetation derived from PCT 4050 'South Coast Floodplain Wetland Paperbark Scrub' will generate four Ecosystem Credits. The vegetation to be cleared does not meet the definition of any listed Threatened Ecological Communities.

Eighteen Candidate Species Credit Species required further assessment. Surveys for these species were carried out following DPE's taxa-specific survey guideline with regards to timing of the survey, method and survey effort. The presence of three Species Credit Species were recorded during site surveys: the Southern Myotis (*Myotis macropus*), the Squirrel Glider (*Petaurus norfolcensis*) and the Powerful Owl (*Ninox strenua*). For the Southern Myotis, 1.27 ha of suitable habitat would be impacted, generating thirteen Species Credits. For the Squirrel Glider and the Powerful Owl, 0.07 ha of suitable habitat would be impacted, generating 1 Species Credit each.

Thirty-two native and living paddock trees within the Subject Land meet the BAM 2020 definition of 'scattered trees'. The proposed removal of fourteen of these trees generated Ecosystem Credit obligations from two different PCTs: PCT 3332 Southeast Lowland Grassy Woodland (12 Ecosystem Credits) and PCT 4050 South Coast Floodplain Wetland Paperbark Scrub (2 Ecosystem Credit).

Mitigation measures have been outlined to reduce the impacts to biodiversity.

The retirement of credits will be carried out in accordance with the NSW BC Act.

APPENDICES

- Appendix A:** BAM Biodiversity Credit summary reports
- Appendix B:** Scattered paddock trees
- Appendix C:** Fauna survey reports (three separate files)
- Appendix D:** Flora survey track logs
- Appendix E:** Qualifications of survey personnel
- Appendix F:** BAM plot data
- Appendix G:** BAM plot photos
- Appendix H:** Matters of National Significance
- Appendix I:** Habitat assessment of EPBC Act listed species
- Appendix J:** Subdivision proposal, overall concept plan, Ocre Engineering April 2025

13. REFERENCES

- Arboriculture Consultancy Group (2023) *Tree Management Plan. Visual tree Assessment and Tree Protection Plan for Lot 2 DP 1287077 Wolumla*. Unpublished report.
- Bega Valley Shire Council (2013) *Local Environmental Plan*, Bega.
- Local Environmental Solutions (2022) *Preliminary Biodiversity Assessment Lot 2 DP1287077*. Unpublished report.
- Department of Environment and Conservation NSW (2004 working draft) *Threatened biodiversity survey and assessment: Guidelines for developments and activities*. DEC, Sydney.
- Department of Planning, Industry and Environment NSW (2020) *Survey Guide for Threatened Frogs. NSW survey guide for the BAM method*. DPIE, Sydney.
- Department of Planning, Industry and Environment NSW (2020) *Surveying threatened plants and their habitats. NSW survey guide for the BAM method*. DPIE, Sydney.
- Department of Sustainability, Environment, Water, Population and Communities (2011) *Survey guidelines for Australia's threatened mammals: Guidelines for detecting mammals listed as threatened under the EPBC Act*. Commonwealth of Australia, Canberra.
- NSW Office of Environment and Heritage (2018) *'Species credit' threatened bats and their habitats. NSW survey guide for the Biodiversity Assessment Method*. OEH, Queanbeyan.
- Phillips S, and Callaghan J (2011) The Spot Assessment Technique: A tool for determining localised levels of habitat use by Koalas *Phascolarctos cinereus*. *Australian Zoologist*, Vol 35(3), p.774-780.
- Tulau M J (1997) *Soil Landscapes of the Bega-Goalen Point 1:100 000 Sheet Report*. Department of Land and Water Conservation, Sydney.

14. FIGURES

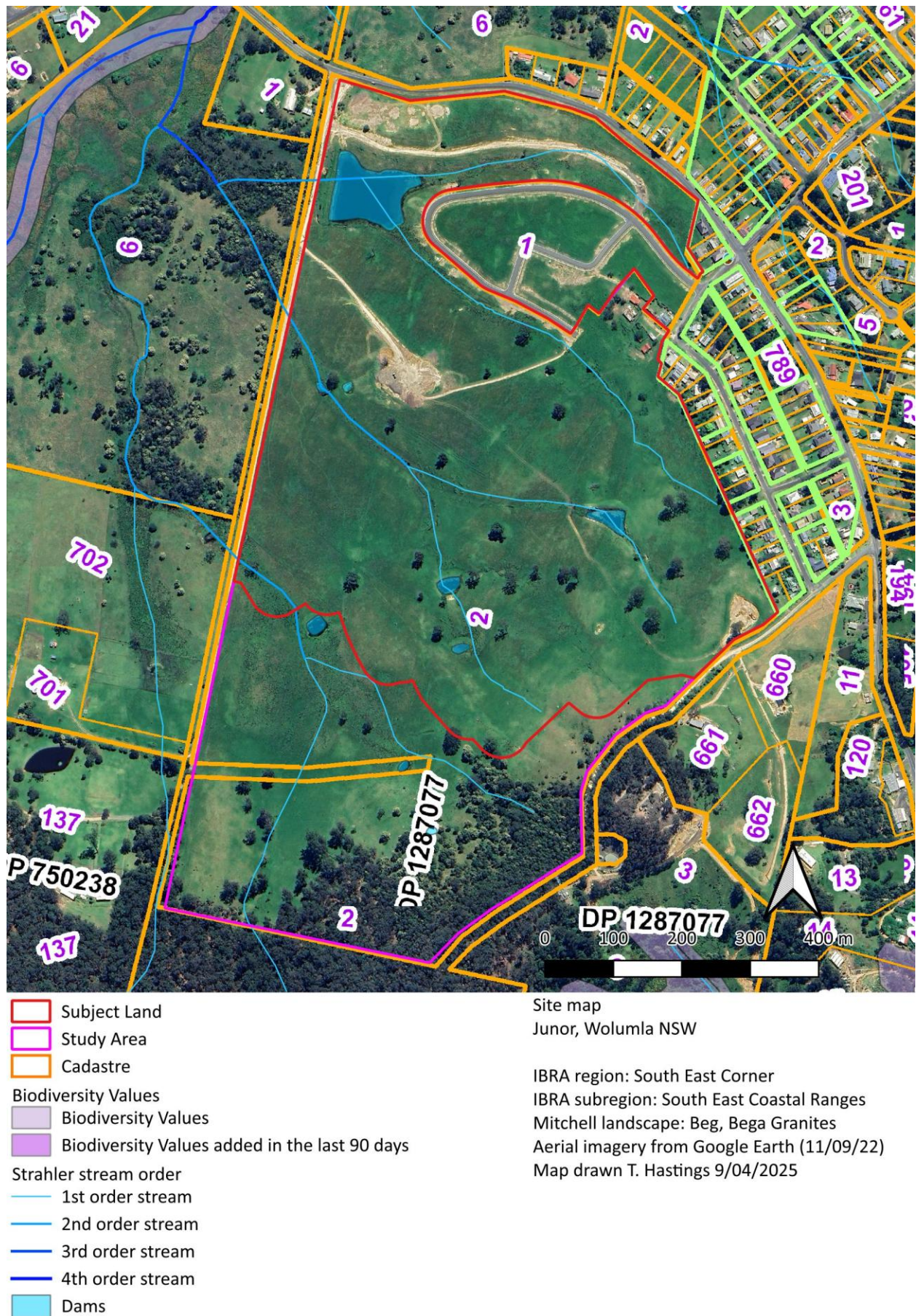


Figure 1 Site Map.

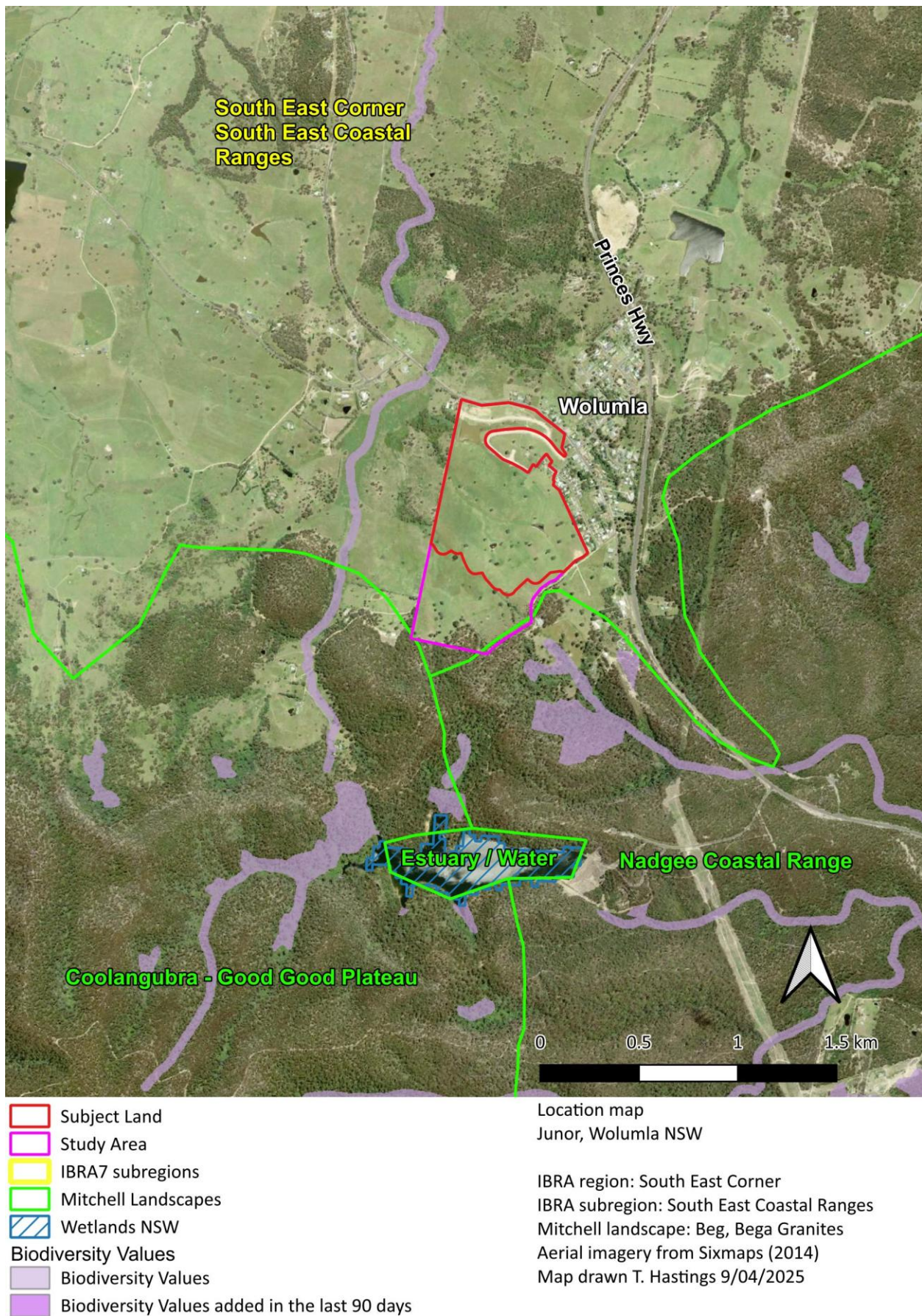


Figure 2 Location Map.

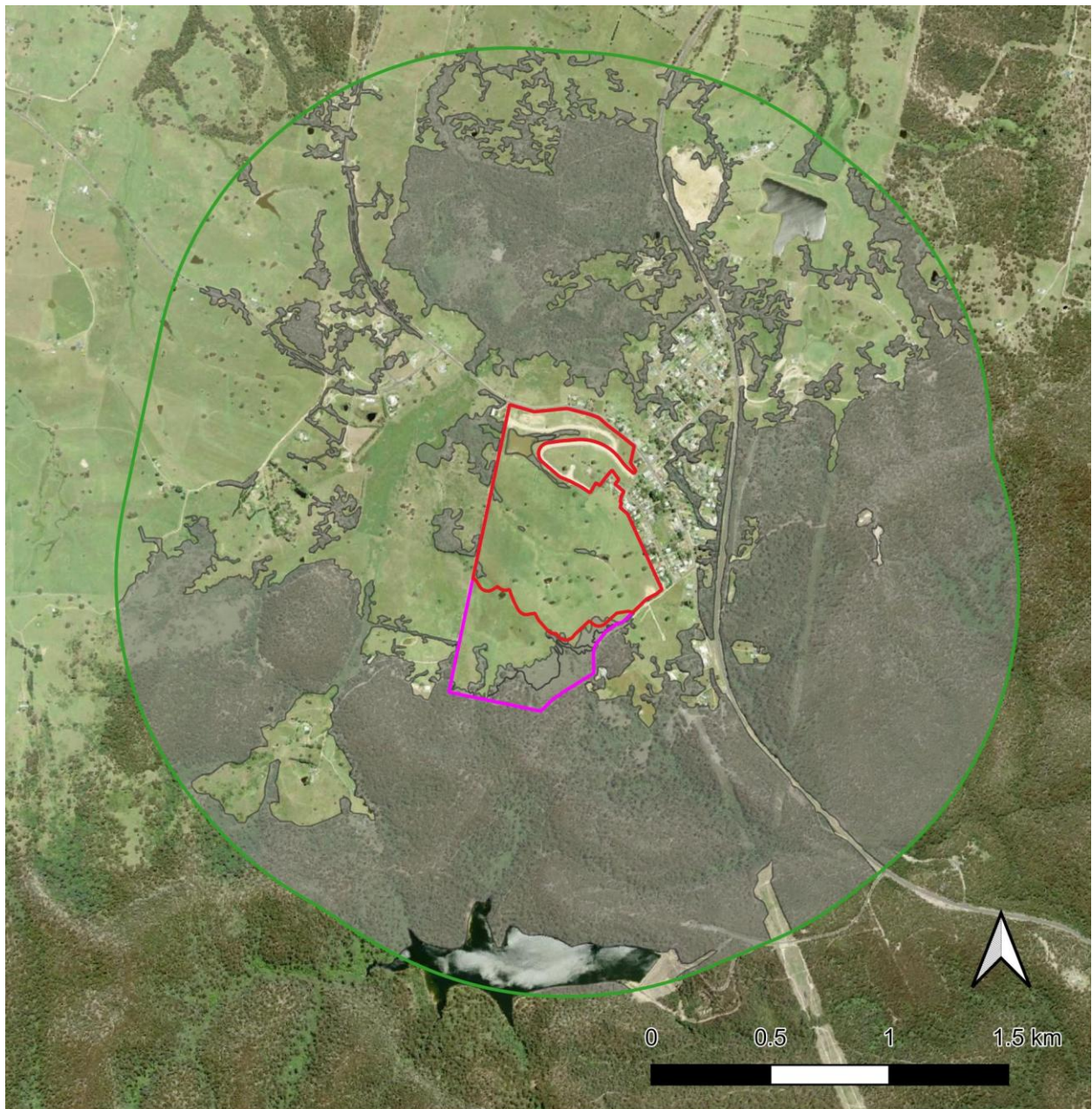


- Subject Land
- Study Area
- Proposed Lot boundaries
- Asset Protection Zone

Development Plan
Junior, Wolumla NSW

IBRA region: South East Corner
IBRA subregion: South East Coastal Ranges
Mitchell landscape: Beg, Bega Granites
Aerial imagery from Google Earth (11/09/22)
Map drawn T. Hastings 9/04/2025

Figure 3 Development layout plan. The Subject Land includes the subdivision footprint and a 40 m wide Asset Protection Zone along the southern boundary.



- Study Area
- Subject Land
- Assessment area (1500m buffer); 1193 ha
- Native vegetation within 1500m, 664 ha (56%)

Native vegetation within assessment area
 Junor, Wolumla
 IBRA region: South East Corner
 IBRA subregion: South East Coastal Ranges
 Mitchell landscape: Bega Granites
 Map drawn T. Hastings 9/04/2025

Figure 4 Assessment Area: native vegetation within 1500 m radius.



- Subject Land
- Study Area
- BAM Plots
- Dams

Vegetation Zones in the Study Area

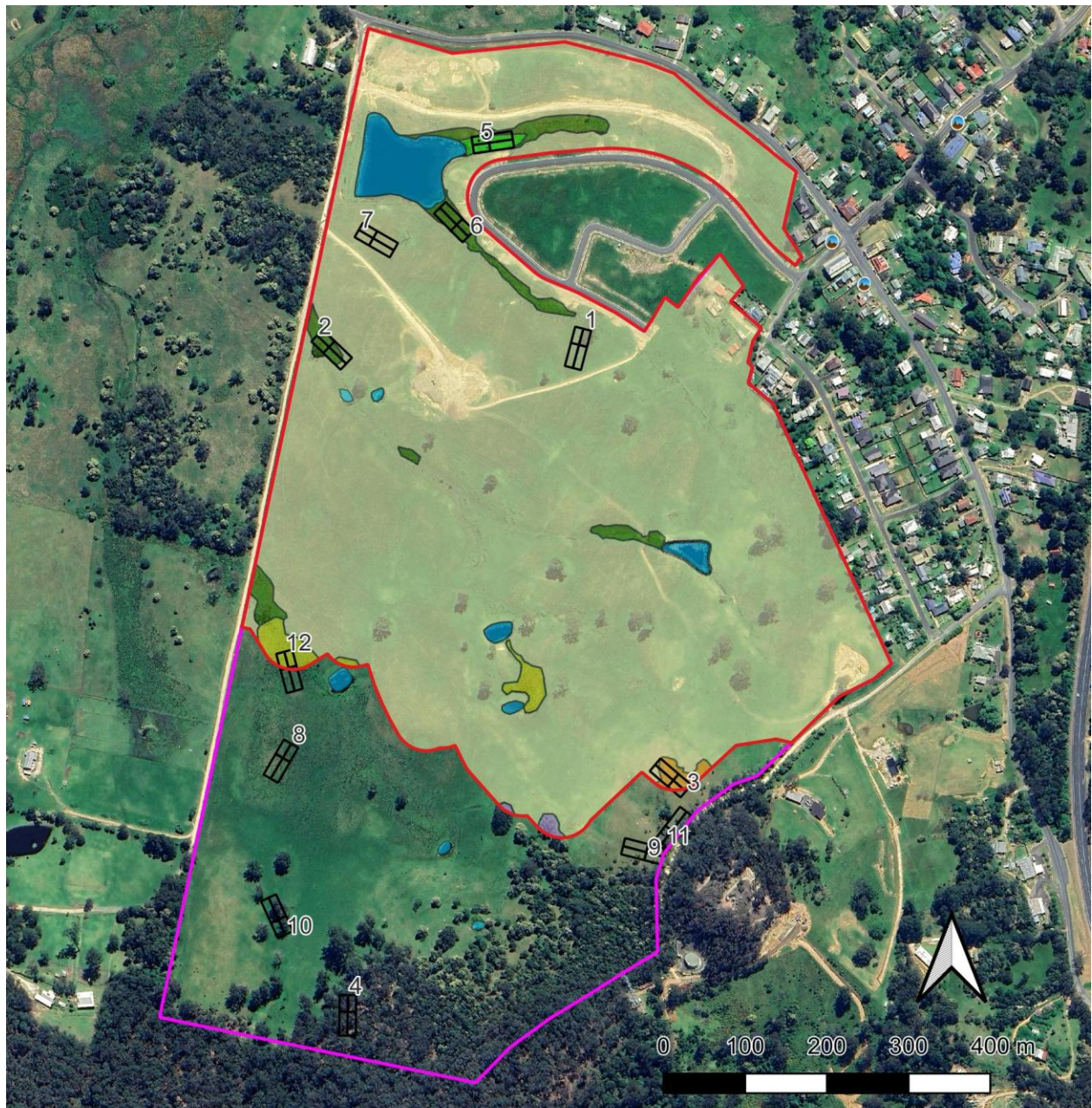
- Zone 1: Wetland shrubby; PCT 4050 South Coast Floodplain Wetland Paperbark Scrub
- Zone 2: Wetland; PCT 4050 South Coast Floodplain Wetland Paperbark Scrub
- Zone 3: Native pasture; PCT 3183 Far South Hinterland Stringybark Sheltered Forest
- Zone 4: Overstorey only; PCT 3332 Southeast Lowland Grassy Woodland
- Zone 5: Wet exotic pasture, former PCT 3332 Southeast Lowland Grassy Woodland
- Zone 6: Exotic pasture, former PCT 3332 Southeast Lowland Grassy Woodland
- Zone 7: Regrowth forest; PCT 3183 Far South Hinterland Stringybark Sheltered Forest
- Zone 8: Sheltered forest; PCT 3183 Far South Hinterland Stringybark Sheltered Forest

Vegetation Zones in the Study Area
Junior, Wolumla NSW

IBRA region: South East Corner
IBRA subregion: South East Coastal Ranges
Mitchell landscape: Bega Granites
Aerial imagery from Google earth
(11/09/2022)

Map drawn T. Hastings 11/04/2025

Figure 5 Plant Community Types and Vegetation Zones in Study Area.



Subject Land

Study Area

BAM Plots

Vegetation Zones on the Subject Land 8apr25

Zone 1: Wetland shrubby; PCT 4050 South Coast Floodplain Wetland Paperbark Scrub, 0.13 ha

Zone 2: Wetland; PCT 4050 South Coast Floodplain Wetland Paperbark Scrub, 1.14 ha

Zone 3: Native pasture; PCT 3183 Far South Hinterland Stringybark Sheltered Forest, 0.19 ha

Zone 4: Overstorey only; PCT 3332 Southeast Lowland Grassy Woodland, 0.07 ha

Zone 5: Wet exotic pasture, former PCT 3332 Southeast Lowland Grassy Woodland, 0.48 ha

Zone 6: Exotic pasture, former PCT 3332 Southeast Lowland Grassy Woodland, 44.02 ha

Dams

Vegetation Zones on the Subject Land
Junor, Wolumla NSW

IBRA region: South East Corner

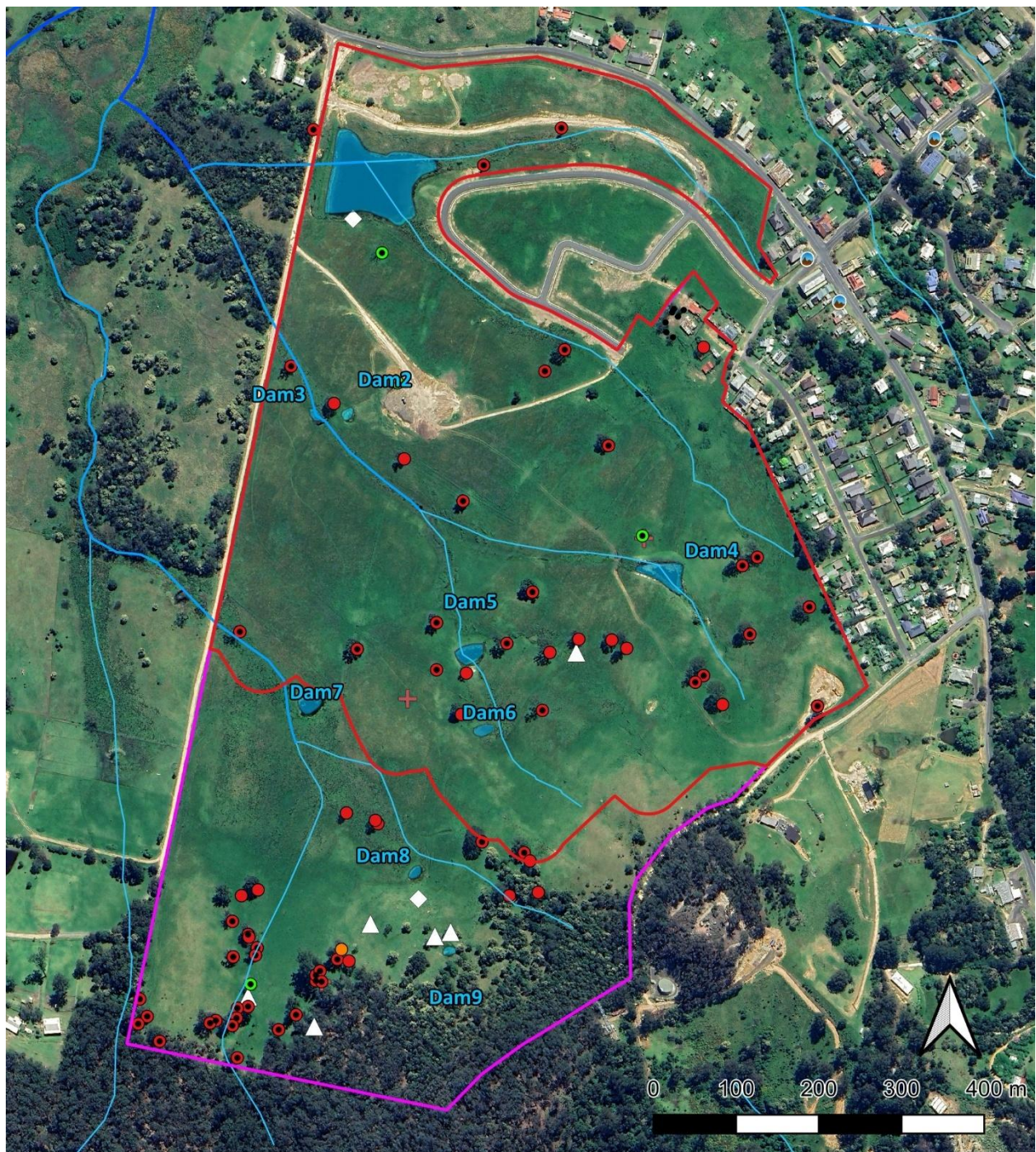
IBRA subregion: South East Coastal Ranges

Mitchell landscape: Bega Granites

Aerial imagery from Google Earth (11/09/22)

Map drawn T. Hastings 11/04/2025

Figure 6 Plant Community Types and Vegetation Zones on Subject Land.



- Subject Land
- Study Area

Habitat trees

- BAM Class 2
- BAM Class 3
- Dead stag

Other habitat constraints

- + Coarse woody debris
- △ Boulder
- ◇ Rocky outcrop
- Hollow-bearing tree

- Strahler stream order
- 1st order stream
 - 2nd order stream
 - 3rd order stream
 - 4th order stream
 - Dams

Habitat features
Junor, Wolumla NSW

IBRA region: South East Corner
IBRA subregion: South East Coastal Ranges
Mitchell landscape: Bega Granites
Aerial imagery from SixMaps (2014 -2015)

Map drawn T. Hastings 22/04/2025

Figure 7 Habitat constraints: native vegetation, scattered trees, rocks, dams and streams.



Subject Land

Study Area

Scattered trees generating credits

● Hollow-bearing trees

● Other trees generating credits

Dams

Scattered trees that generate offset credits
Junior, Wolumla NSW

IBRA region: South East Corner

IBRA subregion: South East Coastal Ranges

Mitchell landscape: Bega Granites

Aerial imagery from SixMaps (2014 -2015)

Map drawn T. Hastings 23/04/2025

Figure 8 Scattered paddock trees generating Ecosystem Credits.



- Subject Land
- Study Area
- Dams
- Threatened species habitat polygons
 - Southern Myotis, 1.27 ha
 - Powerful Owl & Squirrel Glider, 0.07 ha
- Vegetation Zones on the Subject Land
 - Zone 1: PCT 4050 Wetland shrubby
 - Zone 2: PCT 4050 Wetland
 - Zone 3: PCT 3183 Native pasture
 - Zone 4: PCT 3332 Overstorey only
 - Zone 5: PCT 3332 Wet exotic pasture
 - Zone 6: PCT 3332 Exotic pasture

Threatened species habitat polygons
Junor, Wolumla NSW

NOTES:

Southern Myotis requires native vegetation along gullies, within 200m of water that exceeds 3m in width. This equates to all of Zones 1 & 2.

Both Powerful Owl and Squirrel Glider may utilise mature trees, including Zone 4.

Map drawn T. Hastings 23/04/2025

Figure 9 Threatened species habitat polygons.

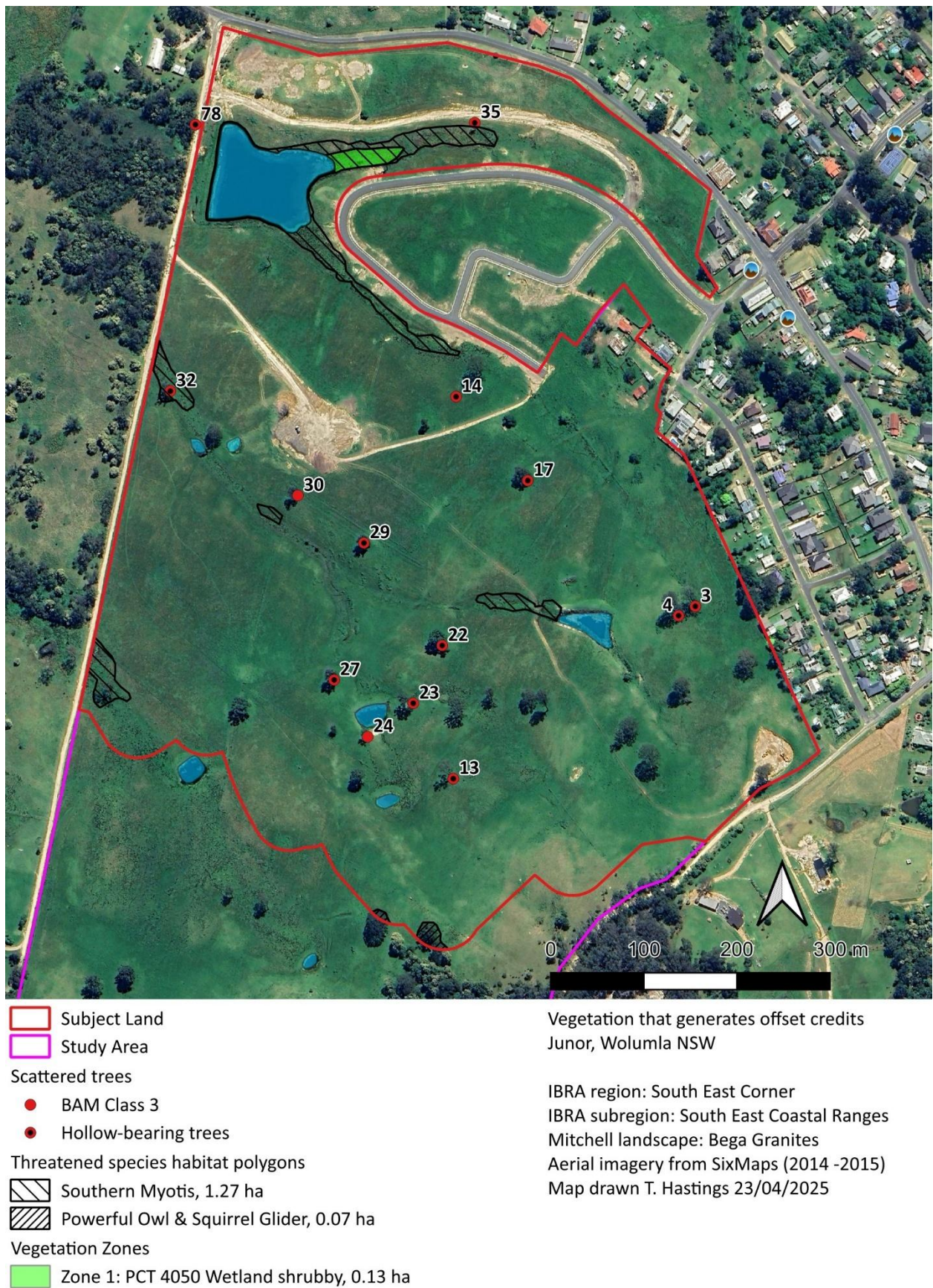


Figure 10 Impacts requiring an offset.

APPENDIX A BAM CREDIT SUMMARY REPORTS



BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00036307/BAAS18161/22/00036308	Wolumla Junior	28/10/2024
Assessor Name	Assessor Number	BAM Data version *
Elisabeth Larsen	BAAS18161	Current classification (live - default) (80)
Proponent Names	Report Created	BAM Case Status
	12/04/2025	Open
Assessment Revision	BOS entry trigger	Assessment Type
1	BOS Threshold: Area clearing threshold	Part 4 Developments (General)
Date Finalised	* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.	
To be finalised		

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	Page 1 of 6
00036307/BAAS18161/22/00036308	Wolumla Junior	



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

Calidris alba / Sanderling

Calyptrorhynchus lathamii lathamii / South-eastern Glossy Black-Cockatoo

Ixobrychus flavicollis / Black Bittern

Petaurus australis / Yellow-bellied Glider

Calidris canutus / Red Knot

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
4050-South Coast Floodplain Wetland Paperbark Scrub	Not a TEC	1.3	0	4	4
3183-Far South Hinterland Stringybark Sheltered Forest	Not a TEC	0.2	0	0	0
3332-Southeast Lowland Grassy Woodland	Not a TEC	0.6	0	0	0

Assessment Id

00036307/BAAS18161/22/00036308

Proposal Name

Wolumla Junior

Page 2 of 6



BAM Biodiversity Credit Report (Like for like)

3183-Far South Hinterland Stringybark Sheltered Forest	Like-for-like credit retirement options					
	Class	Trading group	Zone	HBT	Credits	IBRA region
	South Coast Wet Sclerophyll Forests This includes PCT's: 3107, 3108, 3181, 3182, 3183, 3184, 3185, 3186, 3187, 3188, 3189, 3190, 3191, 3192, 3193, 3194, 3196, 3197	South Coast Wet Sclerophyll Forests <50%	3183_Native_p asture	No	0	South East Coastal Ranges, Bateman, Bungonia, East Gippsland Lowlands, Kybeyan-Gourock, Monaro and Snowy Mountains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
3332-Southeast Lowland Grassy Woodland	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%	3332_Overstor ey_only	Yes	0	South East Coastal Ranges, Bateman, Bungonia, East Gippsland Lowlands, Kybeyan-Gourock, Monaro and Snowy Mountains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Assessment Id

00036307/BAAS18161/22/00036308

Proposal Name

Wolumla Junor

Page 3 of 6



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 >=70% and <90%	3332_Wet_exotic_pasture	No		0 South East Coastal Ranges, Bateman, Bungonia, East Gippsland Lowlands, Kybayan-Gourock, Monaro and Snowy Mountains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
4050-South Coast Floodplain Wetland Paperbark Scrub	Like-for-like credit retirement options					
	Class	Trading group	Zone	HBT	Credits	IBRA region
	Coastal Floodplain Wetlands This includes PCT's: 4015, 4023, 4024, 4025, 4026, 4027, 4029, 4034, 4035, 4036, 4037, 4041, 4042, 4044, 4046, 4049, 4050, 4051, 4055, 4059	Coastal Floodplain Wetlands >=70% and <90%	4050_Wetland_shrubby	No	4	South East Coastal Ranges, Bateman, Bungonia, East Gippsland Lowlands, Kybayan-Gourock, Monaro and Snowy Mountains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.



BAM Biodiversity Credit Report (Like for like)

	Coastal Floodplain Wetlands This includes PCT's: 4015, 4023, 4024, 4025, 4026, 4027, 4029, 4034, 4035, 4036, 4037, 4041, 4042, 4044, 4046, 4049, 4050, 4051, 4055, 4059	Coastal Floodplain Wetlands >=70% and <90%	4050_Wetland	No	0	South East Coastal Ranges, Bateman, Bungonia, East Gippsland Lowlands, Kybayan-Gourock, Monaro and Snowy Mountains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

Species	Vegetation Zone/s	Area / Count	Credits
Myotis macropus / Southern Myotis	4050_Wetland, 4050_Wetland_shrubby	1.3	13.00
Ninox strenua / Powerful Owl	3332_Overstorey_only	0.1	1.00
Petaurus norfolcensis / Squirrel Glider	3332_Overstorey_only	0.1	1.00

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 (Like for like)

Ninox strenua / Powerful Owl	Spp	IBRA subregion
	Ninox strenua / Powerful Owl	Any in NSW
Petaurus norfolcensis / Squirrel Glider	Spp	IBRA subregion
	Petaurus norfolcensis / Squirrel Glider	Any in NSW

Scattered trees:



BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00036307/BAAS18161/23/00044630	Wolumla Junor	28/10/2024
Assessor Name	Assessor Number	BAM Data version *
Elisabeth Larsen	BAAS18161	Current classification (live - default) (80)
Proponent Names	Report Created	Date Finalised
	14/04/2025	To be finalised
Assessment Revision	BOS entry trigger	Assessment Type
0	BOS Threshold: Area clearing threshold	Scattered Trees
BAM Case Status	* 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.	
Open		

Potential Serious and Irreversible Impacts

Nil

Additional Information for Approval

PCTs With Customized Benchmarks
No Changes

Ecosystem Credit Summary

Assessment Id	Proposal Name
00036307/BAAS18161/23/00044630	Wolumla Junor



BAM Biodiversity Credit Report (Like for like)

PCT	TEC	HBT Cr	No HBT Cr	Credits
3332-Southeast Lowland Grassy Woodland	Not a TEC	10	2	12
4050-South Coast Floodplain Wetland Paperbark Scrub	Not a TEC	2	0	2

Credit classes for 3332	Like-for-like options				
	Class	Trading group	HBT	Credits	IBRA region
	Coastal Valley Grassy Woodlands	Coastal Valley Grassy Woodlands >=70% and <90%	Yes	10	South East Coastal Ranges, Bateman, Bungonia, East Gippsland Lowlands, Kybayan-Gourock, Monaro and Snowy Mountains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Coastal Valley Grassy Woodlands	Coastal Valley Grassy Woodlands >=70% and <90%	No	2	South East Coastal Ranges, Bateman, Bungonia, East Gippsland Lowlands, Kybayan-Gourock, Monaro and Snowy Mountains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Credit classes for 4050	Like-for-like options				
	Class	Trading group	HBT	Credits	IBRA region



BAM Biodiversity Credit Report (Like for like)

	Coastal Floodplain Wetlands	Coastal Floodplain Wetlands $\geq 70\%$ and $< 90\%$	Yes	2	South East Coastal Ranges, Bateman, Bungonia, East Gippsland Lowlands, Kybeyan-Gourock, Monaro and Snowy Mountains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

APPENDIX B SCATTERED Paddock TREES

Table B-1 Scattered native paddock trees impacted by the proposal (refer to **Figure 7** and **Figure 8**). Trees impacted by the proposal are highlighted in yellow.

All trees were visually inspected for cavities, including hollows, fissures, cracks, and spouts with likely cavities, on 11 August 2023 and 17 April 2025. Refer to Figure B-1 for a map showing all habitat trees (DBH > 50cm) in the Study Area.

Map ID #	Easting	Northing	Species	PCT	DBH cm	Hollow bearing tree?	BAM Class	Impacted by proposal?	Eco-system credits	No. and size of cavities recorded in visual inspections			Comments
										Class 1 ¹	Class 2	Class 3	
1	55750552	5919457	<i>E. tereticornis</i>	3332	120	Yes	3						
2	55750534	5919457	<i>E. tereticornis</i>	3332	140	Yes	3						
3	55750471	5919517	<i>E. tereticornis</i>	3332	120	Yes	3	Yes	1	-	-	1	Small hollow developing
4	55750453	5919507	<i>E. tereticornis</i>	3332	140	Yes	3	Yes	1	-	-	1	Small hollow developing
5	55750462	5919424	<i>E. tereticornis</i>	3332	130	Yes	3						
6	55750429	5919339	<i>E. tereticornis</i>	3332	140	No	3						
7	55750406	5919374	<i>E. tereticornis</i>	3332	120	Yes	3						
8	55750396	5919366	<i>E. muelleriana</i>	3332	130	Yes	3						
9	55750313	5919407	<i>E. tereticornis</i>	3332	110	No	3						
10	55750295	5919417	<i>E. tereticornis</i>	3332	90	No	3						
11	55750255	5919418	<i>E. tereticornis</i>	3332	80	No	3						
12	55750220	5919402	<i>E. tereticornis</i>	3332	110	No	3						
13	55750211	5919332	<i>E. tereticornis</i>	3332	90	Yes	3	Yes	1	-	-	1	Small hollow developing
14	55750214	5919742	<i>E. angophoroides</i>	3332	80	Yes	3	Yes	1	-	-	1	Vertical crack with cavity
15	55750238	5919768	<i>E. tereticornis</i>	3332	110	Yes	3						
17	55750291	5919652	<i>E. muelleriana</i>	3332	150	Yes	3	Yes	1	-	-	5	Small hollows developing,

22	55750199	5919475	<i>A. floribunda</i>	3332	200	Yes	3	Yes	1	-	-	1	Cracks/fissures
23	55750168	5919413	<i>A. floribunda</i>	3332	140	Yes	3	Yes	1	-	-	1	Cracks/fissures
24	55750119	5919377	<i>E. tereticornis</i>	3332	70	No	3	Yes	0.75	-	-	-	None seen
25	55750113	5919327	<i>E. tereticornis</i>	3332	80	No	3						
26	55750083	5919381	<i>E. muell.</i>	3332	100	Yes	3						
27	55750083	5919438	<i>E. muelleriana</i>	3332	210	Yes	3	Yes	1	1	-	-	One large hollow, >30cm wide opening
28	55749987	5919406	<i>A. floribunda</i>	3332	140	Yes	3						
29	55750115	5919585	<i>E. tereticornis</i>	3332	110	Yes	3	Yes	1	-	-	1	Cracks/fissures
30	55750044	5919636	<i>E. tereticornis</i>	3332	100	No	3	Yes	0.75	-	-	-	None seen
31	55749959	5919703	<i>E. tereticornis</i>	3332	100	No	3						
32	55749907	5919748	<i>E. ovata</i>	4050	120	Yes	3	Yes	1	1	2	1	Hollows and cracks/fissures
35	55750234	5920036	<i>E. ovata</i>	3332	80	Yes	3	Yes	1	-	1	2	Spouts
36	55750140	5919991	<i>E. ovata</i>	3332	80	Yes	3						
38	55749845	5919427	<i>E. ovata</i>	4050	130	Yes	3						
77	55750406	5919771	<i>B. populneus</i>	3332	70	No	3						
78	55749934	5920034	<i>E. ovata</i>	4050	80	Yes	3	Yes	1	-	-	1	Small hollow developing
Total number of cavities (hollows, developing hollows, fissures, cracks, and spouts with likely cavities) recorded in trees impacted by the proposal										2	3	17	

¹ Class sizes:

Class 1 – large sized hollow openings (i.e. >15cm) suitable for large species such as owls and cockatoos.

Class 2 – medium sized hollow openings (i.e. 5-15cm) suitable for a range of species including parrots.

Class 3 – small sized hollow openings and cracks (i.e. <5cm) suitable for small species such as microbats.

Figure B-1 Native habitat trees (trees with DBH > 50 cm) in the Study Area. The tree ID numbers used in this BDAR are consistent with the ID numbers used in the Tree Management Plan (Arboriculture 2023).



- Subject Land
- Study Area

Native habitat trees in the Study Area

- BAM Class 2
- BAM Class 3
- Dead stag
- Hollow-bearing trees

Native habitat trees in the Study Area
Junor, Wolumla NSW

IBRA region: South East Corner
IBRA subregion: South East Coastal Ranges
Mitchell landscape: Bega Granites
Aerial imagery from SixMaps (2014 -2015)
Map drawn T. Hastings 23/04/2025

APPENDIX C FAUNA SURVEY REPORTS

See separate files:

- Patmore Sam (August 2023) *Results of targeted surveys for threatened frogs and microbats at Wolumla (Lot 1287077)*. Path co.
- Ford G (August 2023) *Microbat Call Identification Report, Wolumla (Lot 2 DP1287077)*. Balance Environmental.
- Hastings T (November 2023, figures updated 22 April 2025) *Targeted Fauna Surveys, Lot 2 DP1287077, Wolumla*.

APPENDIX D FLORA SURVEY TRACK LOGS

Targeted surveys were completed for four BAM-C Candidate Species Credit Species: Cotoneaster Pomaderris (*Pomaderris cotoneaster*), Hoary Sunray (*Leucochrysum albicans*), Austral Toadflax (*Themeda australis*), and Yellow Loosestrife (*Lysimachia vulgaris*). These four species are also listed as threatened under the EPBC Act.

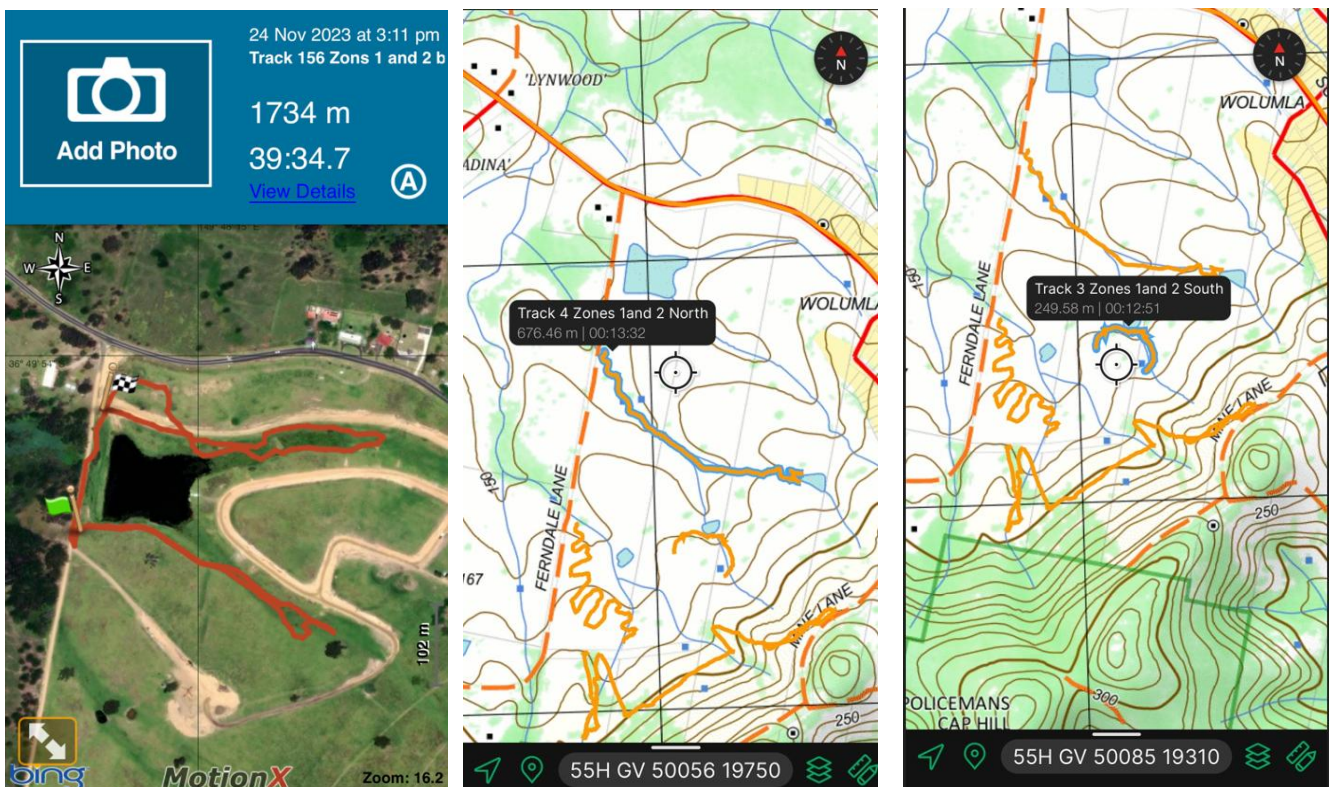
A further ten EPBC-listed flora species were also searched for during surveys: Tall Knotweed (*Persicaria elatior*), Parris Pomaderris (*Pomaderris cotoneaster*), Pretty Beard Orchid (*Calochilus pulchellus*), Leafless Tongue Orchid (*Cryptostylis hunteriana*), Pambula Midge Orchid (*Genoplesium rhyoliticum*), Thick-Lipped Spider Orchid (*Caladenia tessellata*), Clover Glycine (*Glycine latrobeana*), River Swamp Wallaby Grass (*Amphibromus fluitans*), Swamp Everlasting (*Xerochrysum palustre*), Thick Leaf Starhair (*Astrotricha georgensis*).

Method: Relevant vegetation zones were surveyed using the ‘parallel field traverse survey technique’ in accordance with the NSW *Guide to surveying threatened plants and their habitat* (DPIE 2020). Surveys were carried by a team of two surveyors and during recommended survey times for each species.

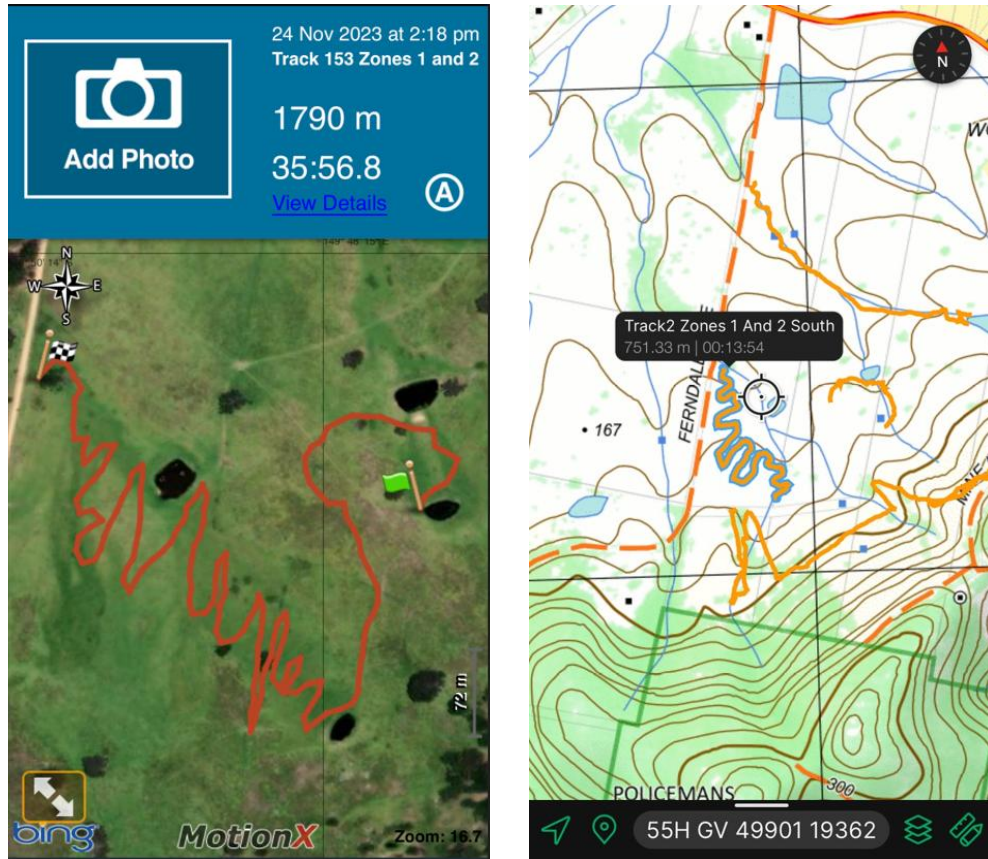
Survey personnel: Elisabeth Larsen, Ecologist

1. Flora survey 24 November 2023

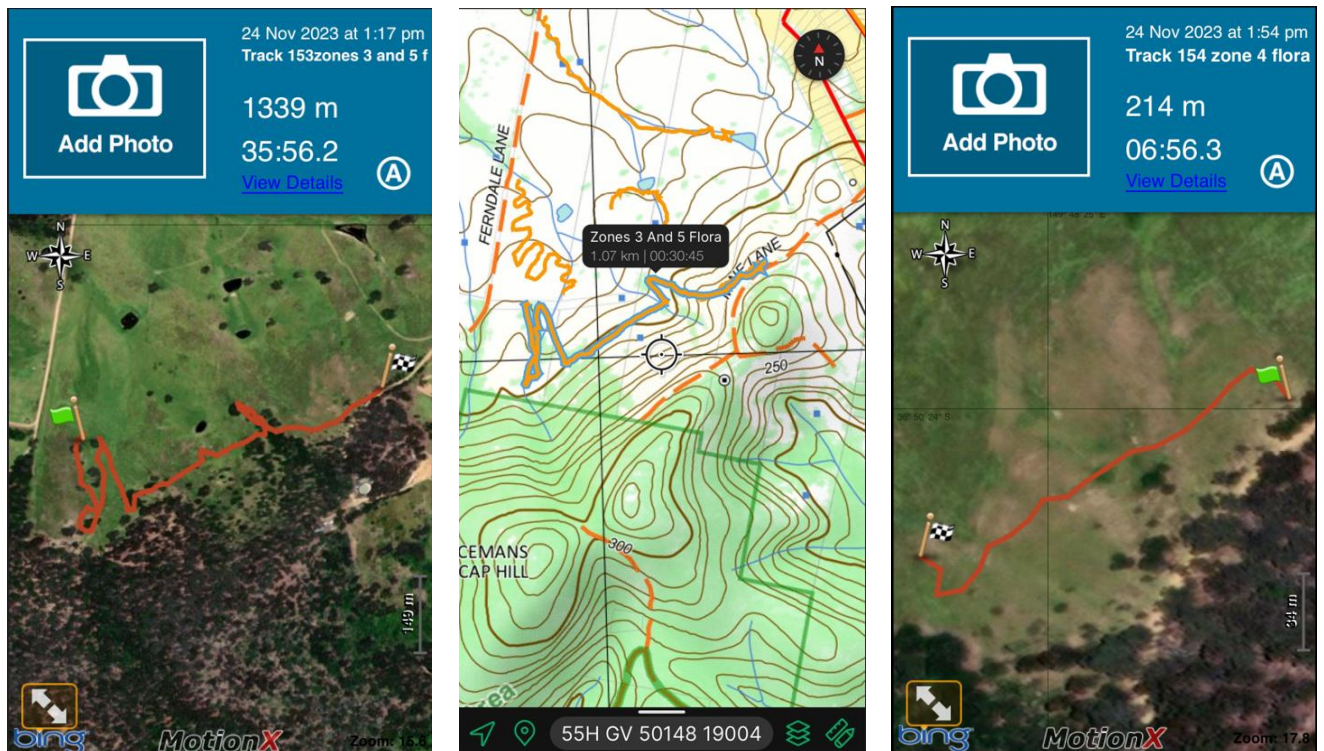
Flora survey track logs, Vegetation Zones 1, 2 and 5 (24 Nov 2023).



Flora survey track logs, Vegetation Zones 1, 2 and 5 (24 November 2023) cont.

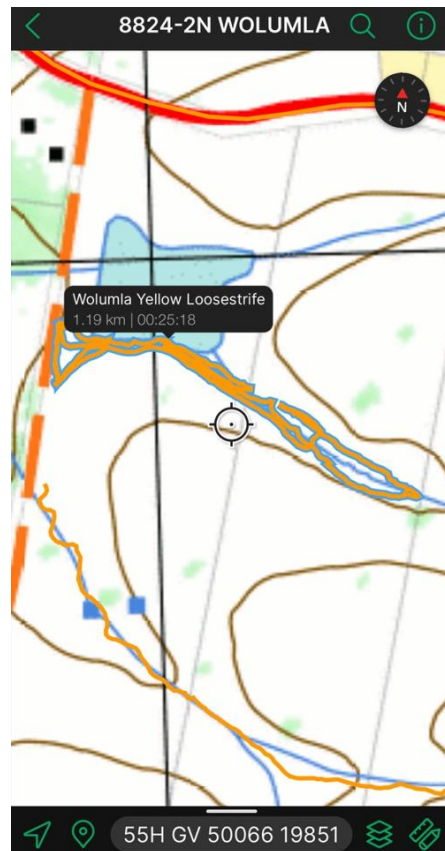
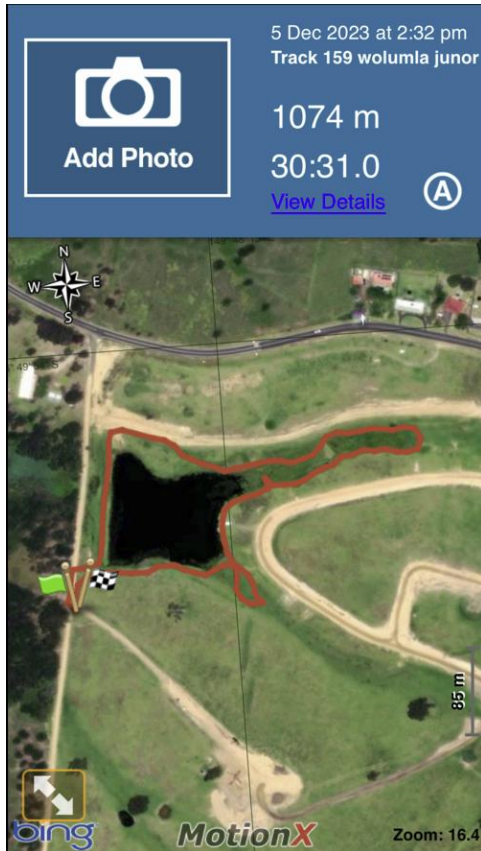


Flora survey track logs, Vegetation Zones 3, 7 and 8 (24 November 2023).



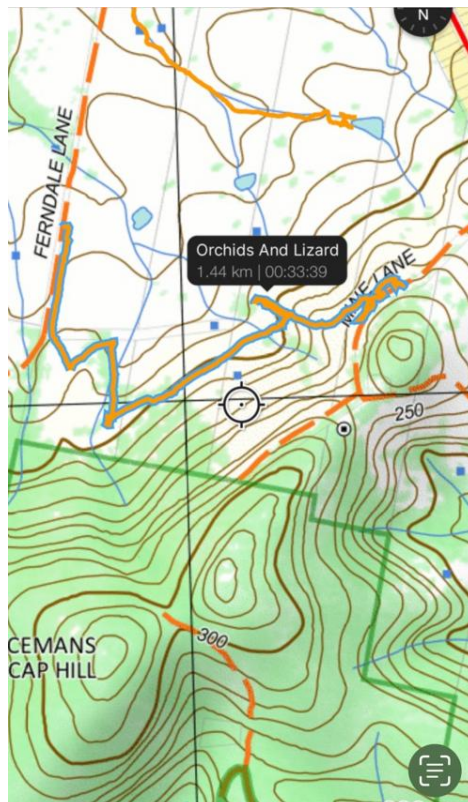
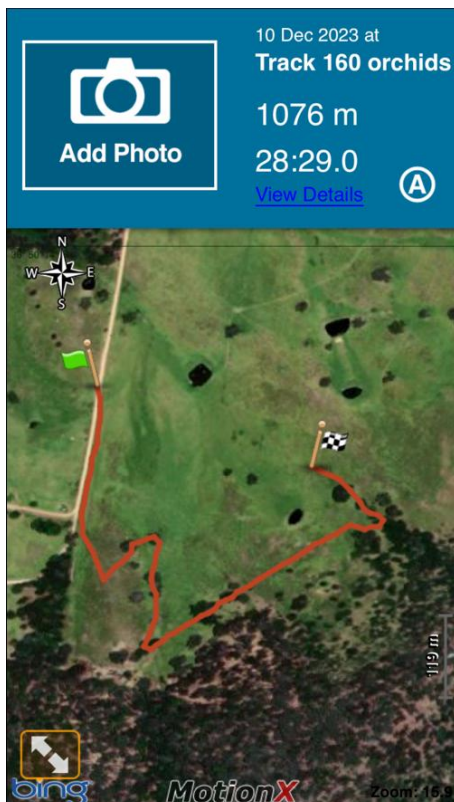
2. Flora survey 5 December 2023

Flora survey track logs, Vegetation Zone 1 (target species: Yellow Loosestrife).



3. Flora survey 10 December 2023

Flora survey track logs, Vegetation Zones 3, 7 and 8 (target species: Orchids).



APPENDIX E SURVEY PERSONNEL

Elisabeth Larsen - Curriculum Vitae

7 High Crescent, Tura Beach, 2548 NSW, mobile: 0448 235 577, email: e.larsen@bigpond.com

Qualifications

- Accredited Biodiversity Assessment Method Assessor (November 2018, renewal in 2021)
- Forest Stewardship Council Forest Management Lead Auditor (March 2020).
- ISO 9011 Lead Auditor (March 2020)
- Master of Environmental Management, Graduate School of the Environment, Macquarie University, Sydney. Awarded the NSW Department of Planning and Environment Prize for being the best graduating student in year 2000.
- Bachelor of Social Sciences, Norwegian School of Economics and University of Bergen, Norway.

Employment history (selection)

Ecologist/Environmental Consultant and Director, Local Environmental Solutions, 2004 - present

- Biodiversity Assessment Reports under the NSW Biodiversity Offset Scheme
- Flora and fauna surveys and impact assessments (also as sub-consultant for NGH Consulting)
- Technical Expert on Forest Stewardship Council certification audits, for SCS Global Services.
- Environmental Impact Statements and Reviews of Environmental Factors
- Environmental Management Plans
- Wildlife Hazard Management Plans and Risk Assessments (e.g. for Merimbula Airport)
- Vegetation Management Plans
- Wildlife surveys using specially trained conservation dogs
- Management of overabundant native species

Director and Chief Goat Herder, Herds-for-Hire, 2011 – 2025

- Vegetation control using goats (weeds, unwanted vegetation/ fire hazards)

Associate Lecturer, University of New South Wales – Master of Conservation Biology, 2005 – 2008

- Course delivery and development
- Student assessment and supervision of projects
- Preparation of research grant applications and research papers for publication

Associate Lecturer, Macquarie University – Master of Conservation Biology, 2003 – 2004

- Student assessment and supervision of projects
- Course development (background research, development of teaching material, assist in delivery)
- Preparation of research grant applications and research papers for publication

Postgraduate Program Developer, Macquarie University, Dep of Biological Sciences 2001 – 2002

- Planning and delivery of a 'Master of Wildlife Management' program
- Facilitate budgeting and reporting to the Department of Education, Science and Training.
- Oversee the educational cohesion of course material
- Negotiate workplace experiential programs for students

Project Officer (birds and mammals), Macquarie University May – July 2002: Fauna and ethno-botanical survey work in the Kimberley, WA. Data collection (bird surveys, small mammal trapping, flora surveys), data analysis and reporting.

Course developer, Macquarie University, Dep of Biological Sciences Nov 2002: Research and prepare material for undergraduate courses in marine ecology and pacific indigenous studies.

Researcher (birds), Macquarie University Jan – June 2001: Avian behavioural ecology research NSW.

Tony Hastings – Curriculum Vitae

25 Parker St, Bega NSW 2550, mobile: 0427 534 548, tony@tonyhastings.com.au

Environmental Consultant: 2021 - ongoing, Self-employed Environmental Consultant. 2018 - 20, NGH Consulting, Environmental Consultant. 2009 – 2011 Manna Park & Mandeni Cabins, Resident naturalist. Duties including GIS operation, Biodiversity Assessment Method (BAM) surveys & reports, targeted species surveys, desktop constraints assessments, plant identification, plant community identification, scientific research, variety of ecological reports.

Ranger & Summer Ranger: 2006 - 08, Parks Victoria. Duties including design new interpretive signage, provide information to the public, revegetation of various ecosystems, plan and present tourist activities

GIS operation: (computer-based mapping) since 1995, including MapInfo, ArcView, Manifold and QGIS
Targeted flora & fauna surveys: Since 1993, including spotlighting, hair-tubing, scat analysis, hair identification, yabby trap survey, pitfall trapping, track identification, plant identification, develop rainforest identification keys, Koala SAT surveys, coordinate survey teams in the field. WIRES animal rescuer since 2010.

Legal: Prepared and helped win cases for Magistrates, Family, County and Supreme Courts. Prepared, presented and won the case of *Hastings v Brennan & Anor*; [2005] VSC, before the Supreme Court of Victoria, which produced rulings that provide protection for threatened species in State Forests via the Code of Forest Practice, and led to 33,500 ha of new National Parks.

Qualifications include:

2012	Environmental Science	Honours	Charles Sturt University
2009	Environmental Science (Management)	Degree	Charles Sturt University
2004	Natural Resource Management	Diploma	Swinburne TAFE
2015	Training and Assessment	Certificate IV	TAFE NSW Illawarra
2003	Renewable Energy Technology	Certificate IV	Swinburne TAFE

Accreditations

2022	First Aid, CPR, life support	Certificate	St John Ambulance
2021	NSW Biodiversity Offsets Scheme Accredited Assessors Training Course	Certificate	GreenCap
2020	Agricultural Chemical Skill Set	Certificate	Illawarra TAFE, Bega
2020	Working with Children Check; WWC0252185E		NSW Government
2019	Drive & recover 4WD in difficult terrain	Certificate	Transport Industries Skills Centre
2019	Advanced Plant Identification skills	Certificate	Centre for Ecosystem Science
2017	Reptile & Venous Snake Handling	Certificate	WIRES
2011	Reptile & Amphibian Rescue Rehabilitation & Release	Certificate	WIRES
2010	Bat Identification, Rescue, Rehabilitation & Release	Certificate	WIRES
2010	Vertebrate Pesticide Induction	Certificate	LHPA
2010	Rescue & immediate care	License	WIRES
2006	OH & S for Coastal Volunteers	Certificate	Coast Care
2005	Chainsaw Operation & Maintenance	Certificate	Gippsland TAFE
1997	Permaculture Design	Certificate	David Holmgren

Sam Patmore- Curriculum Vitae

108 Shipton Lane, Verona NSW 2550, mobile: 0439 655 120 email: sam.p@path-co.com.au

Founding Director of PATH Co Pty Ltd and has a strong background in environmental consulting, with 15 years professional experience in this field, and across a variety of jurisdictions, including the ACT, NSW and Queensland. Graduated from the University of Canberra in 1999, with a Bachelor of Applied Science majoring in water science and environmental research and design, and completed a post-graduate research honours project in 2001 investigating the distribution, abundance, habitat use and movement patterns of the vulnerable Green and Golden Bell Frog at sites in the southern tablelands of NSW.

The following are examples of some of the most recent projects that Sam has been involved with in a key role, including both projects delivered by PATH Co, and/or projects that Sam worked on as a previous employee of or as a sub-consultant to other companies:

- **Green and Golden Bell Frog Monitoring Project (2020-present).** Sam has been commissioned by NSW NPWS/OEH to undertake the monitoring of the Green and Golden Bell Frog population on the Upper Molonglo River, near Captain's Flat, NSW. This project is being funded through the NSW Saving Our Species (SoS) program (PATH Co project).
- **Green and Golden Bell Frog Habitat Assessment, Rehabilitation and Re-introduction Management Strategy (2018/19).** Sam was commissioned by The Mulloon Institute to undertake a habitat assessment of the Mulloon Creek Home Farm near Bungendore NSW and to provide a management strategy to aid in the floodplain rehydration and rehabilitation project, including advice on habitat improvement and strategies for a possible future (re)introduction of the Green and Golden Bell Frog into this system (PATH Co project).
- **Snowy 2.0 (2019-present).** Sam was part of a team of ecologists providing ecological services to the delivery of this project including pre-clearing habitat assessments, as well as fauna spotter/catcher services during habitat tree felling (sub-consultant to Umwelt).
- **AARNet Fibre Optic Telecommunications Installations (Canberra to Sydney) (2020).** Sam has been commissioned by AARNet to provide ecological advice and related services to assist with the delivery of a major telecommunications infrastructure project provide Fibre Optic communications between Canberra and Sydney. This has involved an assessment of the project across a large (linear) area, in a variety of habitat, including within National Parks and other reserve systems, and across both the ACT and NSW jurisdictions (PATH Co project).
- **Princes Highway Bushfire Resilience Project (2020).** Sam was responsible for undertaking the assessment of habitat trees along the Princes Highway road corridor from the Victorian Border to the near Cobargo, as well as the preparation of the biodiversity impact assessment report for the (Minor Works) REF for Transport for NSW (sub-consultant to NGH).
- **Lighthouse to Lighthouse Great Walk (NGH/NPWS) (2019).** Sam was commissioned as a specialist sub-consultant to undertake targeted fauna surveys along a circa 30km length of proposed walking trails at Green Cape National Park for NSW NPWS (sub-consultant to NGH).
- **Koala Reserve surveys (NGH/NPWS) (2019).** Sam was commissioned as a specialist sub-consultant to undertake targeted koala surveys at over 25 sites in the Jindabyne region to investigate the potential of areas for the establishment of a koala reserve for NSW NPWS (sub-consultant to NGH).
- **Threatened species surveys at Eurobodalla National Park (2022).** Sam was a key researcher undertaking threatened species surveys within the Eurobodalla National Park for NSW NPWS, including co-author of the final monitoring report.
- **Threatened species surveys at Brogo Reserve (2021).** Sam was a key researcher undertaking threatened species surveys within the Brogo Reserve for Bush Heritage Australia, including co-author of the final monitoring report.
- **Monaro Highway Upgrade (2020/21).** Sam was commissioned as a specialist sub-consultant to undertake targeted reptile (artificial tile shelter) surveys for the Striped Legless Lizard at the Jerrabomberra Grasslands Reserve in the ACT for the proposed major road upgrades under this project (sub-consultant to Jacobs).

APPENDIX F BAM PLOT DATA

1. BAM Plot 1 PCT 3332 Exotic pasture

BAM Site Field Survey									
Project:	Wolumla	Plot Identifier	1	Pic 20x20		Pic 20x50			
Survey date:	14/06/2022		Compass Orientation (head of 20x20 plot)				195		
Recorders	JM & EL		PCT: 3332 Exotic pasture						
GPS Easting	750227	GPS Northing	5919771		Datum		Zone	55	
Landform			Soils			Drainage & Slope			
Morphology	Lower slope		Soil Texture			Slope	2		
LandF Element			Soil Colour			Aspect	290		
LandF Pattern			Soil Depth			Drainage	Good		
Microrelief			Geology	Granite		Watercourses	10m ephemeral gully		
Plot Disturbance									
	Severity	Age	Observational Evidence						
Clearing	3	0							
Cultivation	0								
Soil erosion	0								
Firewood	0								
Grazing	0								
Fire Damage	0								
Storm Damage	0								
Weediness	3								
Other	0								
Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)									
Additional information									
Current land use									
Age class of trees (DBH range) , Condition of Vegetation, Hollows									
Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)									
Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)									
Dominant Species outside Plot									

FUNCTION

Function attributes for			1	
BAM Attribute (20x20m plot)				
Count of Native Richness	Stratum	Sum		
	Tree (TG)	0		
	Shrub (SG)	0		
	Forb (FG)	0		
	Grass & grasslike (GG)	2		
	Fern (EG)	0		
	Other (OG)	0		
	TOTAL	2		
BAM Attribute (20x20m plot)				
Count of cover abundance (native vascular plants)	Stratum	Sum		
	Tree (TG)	2		
	Shrub (SG)	0		
	Forb (FG)	0		
	Grass & grasslike (GG)	0.2		
	Fern (EG)	0		
	Other (OG)	0		
	TOTAL Native	2.2		
TOTAL 'HTE'			96.1	
BAM Attribute (20 x 50m plot) Tree Stem Counts				
DBH (cm)	Euc	Non Euc	Hollows	
>80	0			
50-79	0			
30-49	0			
20-29	0			
10-19	0			
5-9	0			
<5	0		N/A	
Length of logs (m)		0		
BAM Attributes (1 x 1m Plots)				
Litter Cover	Tape length	% cover	Average %	Photos
	5m	0%	0.00%	
	15m	0%		
	25m	0%		
	35m	0%		
Bare ground cover	45m	0%	0%	
	5m	0%		
	15m	0%		
	25m	0%		
Cryptogam cover	35m	0%	0%	
	45m	0%		
	5m	0%		
	15m	0%		
Rock Cover	25m	0%	0%	
	35m	0%		
	45m	0%		
	5m	0%		

COMPOSITION & STRUCTURE

Species recorded for 1										
Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
penn clan	<i>Pennisetum clandestinum</i>	Kikuyu Grass	Poaceae	95	1000	*		HTE		
pasp dila	<i>Paspalum dilatatum</i>	Paspalum	Poaceae	1	20	*		HTE		
holc lana	<i>Holcus lanatus</i>	Yorkshire Fog	Poaceae	1	50	*		No		
cirs vulg	<i>Cirsium vulgare</i>	Spear Thistle	Asteraceae	1	10	*		No		
cony suma	<i>Conyza sumatrensis</i>	Tall fleabane	Asteraceae	0.1	10	*		No		
trif repe	<i>Trifolium repens</i>	White Clover	Fabaceae (Fa)	1	100	*		No		
plan lanc	<i>Plantago lanceolata</i>	Lamb's Tongues	Plantaginaceae	0.1	5	*		No		
leon tara tara	<i>Leontodon taraxacoides</i>	Lesser Hawkbit	Asteraceae	0.1	1	*		No		
hypo radi	<i>Hypochaeris radicata</i>	Catsear	Asteraceae	0.1	1	*		No		
junc	<i>Juncus spp.</i>	A Rush	Juncaceae	0.1	2		Grass & grasslike (GG)	No		
junc usit	<i>Juncus usitatus</i>		Juncaceae	0.1	2		Grass & grasslike (GG)	No		
rubu frut	<i>Rubus fruticosus</i> sp. ag	Blackberry complex	Rosaceae	0.1	1	*		HTE		
euca tere	<i>Eucalyptus tereticornis</i>	Forest Red Gum	Myrtaceae	2	1		Tree (TG)	No		
	#N/A	#N/A	#N/A			#N/A		FALSE	#N/A	#N/A
	#N/A	#N/A	#N/A			#N/A		FALSE	#N/A	#N/A

2. BAM plot 2 PCT 4050 Wetland

BAM Site Field Survey									
Project:	Wolumla	Plot Identifier	2	Pic 20x20		Pic 20x50			
Survey date:	14/06/2022	Compass Orientation (head of 20x20 plot)				135			
Recorders	JM & EL	PCT:	4050, wetland						
GPS Easting	749899	GPS Northing	5919750	Datum		Zone	55		
Landform		Soils			Drainage & Slope				
Morphology	open drainage depression	Soil Texture		Slope	1				
LandF Element		Soil Colour		Aspect	300				
LandF Pattern		Soil Depth		Drainage	Poor				
Microrelief		Geology	Granite	Watercourses	ephemeral gully				
Plot Disturbance									
	Severity	Age	Observational Evidence						
Clearing	3	0							
Cultivation	0								
Soil erosion	0								
Firewood	0								
Grazing	0								
Fire Damage	0								
Storm Damage	0								
Weediness	3								
Other	0								
Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)									
Additional information									
Current land use									
Age class of trees (DBH range) , Condition of Vegetation, Hollows									
Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)									
Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)									
Dominant Species outside Plot									

FUNCTION								
Function attributes for		2						
BAM Attribute (20x20m plot)			BAM Attributes (1 x 1m Plots)					
Count of Native Richness	Stratum	Sum	Litter Cover	Tape length	% cover	Average %	Photos	
	Tree (TG)	0		5m	5%	5.00%		
	Shrub (SG)	0		15m	5%			
	Forb (FG)	2		25m	5%			
	Grass & grasslike (GG)	6		35m	5%			
	Fern (EG)	0		45m	5%			
	Other (OG)	0	Bare ground cover	5m	5%	7%		
	TOTAL	8		15m	5%			
Count of cover abundance (native vascular plants)	Stratum	Sum		25m	5%			
	Tree (TG)	0		35m	10%			
	Shrub (SG)	0		45m	10%			
	Forb (FG)	0.2	Cryptogam cover	5m	0%	0%		
	Grass & grasslike (GG)	11.4		15m	0%			
	Fern (EG)	0		25m	0%			
	Other (OG)	0		35m	0%			
	TOTAL Native	11.6		45m	0%			
	TOTAL 'HTE'	91	Rock Cover	5m	0%	0%		
BAM Attribute (20 x 50m plot) Tree Stem Counts				15m	0%			
DBH (cm)	Euc	Non Euc		Hollows	25m		0%	
>80	0				35m		0%	
50-79	0				45m		0%	
30-49	0							
20-29	0							
10-19	0							
5-9	0							
<5	1		N/A					
Length of logs (m)		2						
>80cm dbh Eucalyptus ovata adjacent to plot								

COMPOSITION & STRUCTURE									
Species recorded for		2							
Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status
junc usit	<i>Juncus usitatus</i>		Juncaceae	10	40		Grass & grasslike (GG)	No	
care appr	<i>Carex appressa</i>	Tall Sedge	Cyperaceae	0.1	1		Grass & grasslike (GG)	No	
isol prol	<i>Isolepis prolifera</i>		Cyperaceae	0.5	100	*		No	
penn clan	<i>Pennisetum clandestinum</i>	Kikuyu Grass	Poaceae	90	1000	*		HTE	
pasp dila	<i>Paspalum dilatatum</i>	Paspalum	Poaceae	1	100	*		HTE	
eleo acut	<i>Eleocharis acuta</i>		Cyperaceae	1	50		Grass & grasslike (GG)	No	
junc	<i>Juncus spp.</i>	A Rush	Juncaceae	0.1	10		Grass & grasslike (GG)	No	
holc lana	<i>Holcus lanatus</i>	Yorkshire Fog	Poaceae	0.2	10	*		No	
pasp vagi	<i>Paspalum vaginatum</i>	Salt-water Couch	Poaceae	0.1	5		Grass & grasslike (GG)	No	
junc cogn	<i>Juncus cognatus</i>		Juncaceae	0.1	20	*		No	
seta parv	<i>Setaria parviflora</i>		Poaceae	0.1	20	*		No	
axon	<i>Axonopus spp.</i>		Poaceae	0.2	20	*		No	
junc plan	<i>Juncus planifolius</i>		Juncaceae	0.1	1		Grass & grasslike (GG)	No	
rume	<i>Rumex spp.</i>	Dock	Polygonaceae	0.1	10	*	Forb (FG)	No	
ranu inun	<i>Ranunculus inundatus</i>	River Buttercup	Ranunculaceae	0.1	5		Forb (FG)	No	
lotu ulig	<i>Lotus uliginosus</i>	Birds-foot Trefoil	Fabaceae (Fa)	0.1	3	*		No	
pers	<i>Persicaria spp.</i>	Knotweed	Polygonaceae	0.1	5	*		No	
trif repe	<i>Trifolium repens</i>	White Clover	Fabaceae (Fa)	0.1	10	*		No	
call stag	<i>Callitriche stagnalis</i>	Common Starwort	Callitricaceae	0.1	2	*		No	
hypo radi	<i>Hypochaeris radicata</i>	Catsear	Asteraceae	0.1	1	*		No	
plan lanc	<i>Plantago lanceolata</i>	Lamb's Tongues	Plantaginaceae	0.1	5	*		No	
cony suma	<i>Conyza sumatrensis</i>	Tall fleabane	Asteraceae	0.1	10	*		No	
	#N/A	#N/A	#N/A			#N/A		FALSE	#N/A
	#N/A	#N/A	#N/A			#N/A		FALSE	#N/A
	#N/A	#N/A	#N/A			#N/A		FALSE	#N/A

3. BAM plot 3 PCT 3183 Native pasture

BAM Site Field Survey							
Project:	Wolumla Junor	Plot Identifier	3	Pic 20x20		Pic 20x50	
Survey date:	15/06/2022	Compass Orientation (head of 20x20 plot)				130	
Recorders	JM EL	PCT:	3183	Native pasture			
GPS Easting	750315	GPS Northing	5919238	Datum		Zone	55
Landform		Soils		Drainage & Slope			
Morphology	mid slope	Soil Texture		Slope	20		
LandF Element		Soil Colour		Aspect	310		
LandF Pattern		Soil Depth		Drainage	good		
Microrelief		Geology	Devonian sandstone	Watercourses	200m gully		
Plot Disturbance							
	Severity	Age	Observational Evidence				
Clearing	3						
Cultivation	0						
Soil erosion	0						
Firewood	0						
Grazing	1	R	Roos				
Fire Damage	0						
Storm Damage	0						
Weediness	2						
Other	0						
Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)							
Additional information							
Current land use							
Age class of trees (DBH range) , Condition of Vegetation, Hollows							
Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)							
Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)							
Dominant Species outside Plot							

FUNCTION

Function attributes for		3					
BAM Attribute (20x20m plot)			BAM Attributes (1 x 1m Plots)				
Count of Native Richness	Stratum	Sum	Litter Cover	Tape length	% cover	Average %	Photos
	Tree (TG)	0		5m	0%		
	Shrub (SG)	1		15m	0%		
	Forb (FG)	3		25m	0%		
	Grass & grasslike (GG)	5		35m	0%		
	Fern (EG)	2		45m	2%		
	Other (OG)	0					
	TOTAL	11					
BAM Attribute (20x20m plot)			Bare ground cover				
Count of cover abundance (native vascular plants)	Stratum	Sum	Cryptogam cover	5m	0%	1%	
	Tree (TG)	0		15m	5%		
	Shrub (SG)	0.1		25m	0%		
	Forb (FG)	0.3		35m	0%		
	Grass & grasslike (GG)	90.8		45m	0%		
	Fern (EG)	0.3					
	Other (OG)	0					
	TOTAL Native	91.5					
BAM Attribute (20 x 50m plot) Tree Stem Counts			Rock Cover				
DBH (cm)	Euc	Non Euc			3%		
>80			5m	0%			
50-79			15m	5%			
30-49			25m	5%			
20-29			35m	2%			
10-19			45m	2%			
5-9							
<5	0						
Length of logs (m)		0					

COMPOSITION & STRUCTURE										
Species recorded for										
		3								
Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
them tria	<i>Themeda triandra</i>		Poaceae	90	1000		Grass & grasslike (GG)	No		
spor afri	<i>Sporobolus africanus</i>	Parramatta Grass	Poaceae	2	100	*		No		
erag curv	<i>Eragrostis curvula</i>	African Lovegrass	Poaceae	0.5	20	*		HTE		
erag lept	<i>Eragrostis leptocarpa</i>	Drooping Lovegrass	Poaceae	0.5	100		Grass & grasslike (GG)	No		
dich micr	<i>Dichelachne micrantha</i>	Shorthair Plumegrass	Poaceae	0.1	20		Grass & grasslike (GG)	No		
seta parv	<i>Setaria parviflora</i>		Poaceae	0.1	1	*		No		
pani effu	<i>Panicum effusum</i>	Hairy Panic	Poaceae	0.1	2		Grass & grasslike (GG)	No		
erag brow	<i>Eragrostis brownii</i>	Brown's Lovegrass	Poaceae	0.1	10		Grass & grasslike (GG)	No		
axon fiss	<i>Axonopus fissifolius</i>	Narrow-leafed Carp	Poaceae	0.1	1	*		HTE		
chei sieb	<i>Cheilanthes sieberi</i>	Rock Fern	Pteridaceae	0.1	20		Fern (EG)	No		
pter escu	<i>Pteridium esculentum</i>	Bracken	Dennstaedti	0.2	40		Fern (EG)	No		
sene mada	<i>Senecio madagascariensis</i>	Fireweed	Asteraceae	5	500	*		HTE		
hypo radi	<i>Hypochaeris radicata</i>	Catsear	Asteraceae	0.5	100	*		No		
lysi arve	<i>Lysimachia arvensis</i>	Scarlet Pimpernel	Myrsinaceae	0.1	5	*		No		
paro bras	<i>Paronychia brasilliana</i>	Chilean Whitlow W	Caryophyllac	0.1	1	*		No		
cony suma	<i>Conyza sumatrensis</i>	Tall fleabane	Asteraceae	0.1	20	*		No		
sisy rosu	<i>Sisyrinchium rosulatum</i>	Scourweed	Iridaceae	0.1	1	*		No		
gamo	<i>Gamochaeta spp.</i>		Asteraceae	0.2	50	*		No		
rume acet	<i>Rumex acetosella</i>	Sheep Sorrel	Polygonaceae	0.1	10	*		No		
face retu	<i>Facelis retusa</i>		Asteraceae	0.1	20	*		No		
wahl grac	<i>Wahlenbergia gracilenta</i>	Annual Bluebell	Campanulac	0.1	1		Forb (FG)	No		
euch japo	<i>Euchiton japonicus</i>		Asteraceae	0.1	1		Forb (FG)	No		
rubu parv	<i>Rubus parvifolius</i>	Native Raspberry	Rosaceae	0.1	5		Shrub (SG)	No		
gamo calv	<i>Gamochaeta calviceps</i>	Cudweed	Asteraceae	0.1	5	*		No		
bide pilo	<i>Bidens pilosa</i>	Cobbler's Pegs	Asteraceae	0.1	5	*		No		
oxal	<i>Oxalis spp.</i>		Oxalidaceae	0.1	1		Forb (FG)	No		
	#N/A	#N/A	#N/A			#N/A		FALSE	#N/A	#N/A
	#N/A	#N/A	#N/A			#N/A		FALSE	#N/A	#N/A

4. BAM plot 4 PCT 3183 Forest

BAM Site Field Survey							
Project:	Wolumla Junor	Plot Identifier	4	Pic 20x20		Pic 20x50	
Survey date:	15/06/2022	Compass Orientation (head of 20x20 plot)				180	
Recorders	JM EL	PCT:	3183	Forest			
GPS Easting	749939	GPS Northing	5918956	Datum		Zone	55
Landform		Soils			Drainage & Slope		
Morphology	lower slope	Soil Texture		Slope	15		
LandF Element		Soil Colour		Aspect	295		
LandF Pattern		Soil Depth	shallow	Drainage	good		
Microrelief		Geology	granite	Watercourses	500m		
Plot Disturbance							
	Severity	Age	Observational Evidence				
Clearing	3	0					
Cultivation	0						
Soil erosion	1	R	Trampling deer & roos				
Firewood	0						
Grazing	2	R	Deer & roos				
Fire Damage	0						
Storm Damage	0						
Weediness	2						
Other	0						
Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)							
Additional information							
Current land use							
Age class of trees (DBH range) , Condition of Vegetation, Hollows							
Disturbances (i.e. fire, grazing, ferals, clearing, logging, soil degradation, pollution, weeds, dieback)							
Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)							
Dominant Species outside Plot							

FUNCTION			
Function attributes for		4	
BAM Attribute (20x20m plot)			
Count of Native Richness	Stratum	Sum	
	Tree (TG)	2	
	Shrub (SG)	7	
	Forb (FG)	7	
	Grass & grasslike (GG)	3	
	Fern (EG)	0	
	Other (OG)	1	
	TOTAL	20	
BAM Attribute (20x20m plot)			
Count of cover abundance (native vascular plants)	Stratum	Sum	
	Tree (TG)	43	
	Shrub (SG)	1.1	
	Forb (FG)	5.9	
	Grass & grasslike (GG)	0.4	
	Fern (EG)	0	
	Other (OG)	0.1	
	TOTAL Native	50.5	
	TOTAL 'HTE'	5.2	

BAM Attribute (20 x 50m plot) Tree Stem Counts			
DBH (cm)	Euc	Non Euc	Hollows
>80	0		0
50-79	3		
30-49	12		
20-29	5		
10-19	1		
5-9	1		
<5	70		N/A
Length of logs (m)		7	

COMPOSITION & STRUCTURE										
Species recorded for										
Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
euca muel	<i>Eucalyptus muelleriana</i>	Yellow Stringybark	Myrtaceae	40	19		Tree (TG)	No		
euca bosi	<i>Eucalyptus bosistoana</i>	Coast Grey Box	Myrtaceae	3	3		Tree (TG)	No		
pitt undu	<i>Pittosporum undulatum</i>	Sweet Pittosporum	Pittosporaceae	0.5	4		Shrub (SG)	No		
acac implexa	<i>Acacia implexa</i>	Hickory Wattle	Fabaceae	0.1	5		Shrub (SG)	No		
acac mear	<i>Acacia mearnsii</i>	Black Wattle	Fabaceae	0.1	5		Shrub (SG)	No		
rubu frut	<i>Rubus fruticosus</i> sp. agg.	Blackberry complex	Rosaceae	0.1	2	*		HTE		
cass trin	<i>Cassinia trinervia</i>		Asteraceae	0.1	3		Shrub (SG)	No		
dodo triq	<i>Dodonaea triquetra</i>	Large-leaf Hop-bush	Sapindaceae	0.1	1		Shrub (SG)	No		
poly samb	<i>Polyscias sabucifolia</i>		Araliaceae	0.1	1		Shrub (SG)	No		
indi aust	<i>Indigofera australis</i>	Australian Indigo	Fabaceae	0.1	1		Shrub (SG)	No		
cenc clan	<i>Cenchrus clandestinus</i>	Kikuyu Grass	Poaceae	5	1	*		HTE		
micr stip	<i>Microlaena stipoides</i>	Weeping Grass	Poaceae	0.2	100		Grass & grasslike (G)	No		
opli imbe	<i>Opilismenus imbecillis</i>		Poaceae	0.1	2		Grass & grasslike (G)	No		
ento marg	<i>Entolasia marginata</i>	Bordered Panic	Poaceae	0.1	1		Grass & grasslike (G)	No		
sola opac	<i>Solanum opacum</i>	Green-berry Nights	Solanaceae	0.1	1		Forb (FG)	No		
gamo calv	<i>Gamochaeta calviceps</i>	Cudweed	Asteraceae	0.1	1	*		No		
desm gunn	<i>Desmodium gunnii</i>	Slender Tick-trefoil	Fabaceae	0.1	1		Forb (FG)	No		
lobe purp	<i>Lobelia purpurascens</i>	Whiteroot	Lobeliaceae	0.5	1		Forb (FG)	No		
tage minu	<i>Tagetes minuta</i>	Stinking Roger	Asteraceae	0.5	50	*		No		
cirs vulg	<i>Cirsium vulgare</i>	Spear Thistle	Asteraceae	1	50	*		No		
sige orie	<i>Sigesbeckia orientalis</i>	Indian Weed	Asteraceae	3	100		Forb (FG)	No		
hypo radi	<i>Hypochaeris radicata</i>	Catsear	Asteraceae	1	50	*		No		
phyt octa	<i>Phytolacca octandra</i>	Inkweed	Phytolaccaceae	1	20	*		No		
eina hast	<i>Einadia hastata</i>	Berry Saltbush	Chenopodiaceae	2	20		Forb (FG)	No		
cony suma	<i>Conyza sumatrensis</i>	Tall fleabane	Asteraceae	0.2	50	*		No		
bide pilo	<i>Bidens pilosa</i>	Cobbler's Pegs	Asteraceae	0.2	50	*		No		
sene mada	<i>Senecio madagascariensis</i>	Fireweed	Asteraceae	0.1	10	*		HTE		
trif repe	<i>Trifolium repens</i>	White Clover	Fabaceae	0.1	1	*		No		
oper aspe	<i>Opercularia aspera</i>	Coarse Stinkweed	Rubiaceae	0.1	3		Forb (FG)	No		
sola nigr	<i>Solanum nigrum</i>	Black-berry Nights	Solanaceae	0.1	1	*		No		
stel medi	<i>Stellaria media</i>	Common Chickweed	Caryophyllaceae	0.1	2	*		No		
sonc aspe	<i>Sonchus asper</i>	Prickly Sowthistle	Asteraceae	0.1	1	*		No		
oxal	<i>Oxalis</i> spp.		Oxalidaceae	0.1	1		Forb (FG)	No		
face retu	<i>Facelis retusa</i>		Asteraceae	0.1	1	*		No		
gamo amer	<i>Gamochaeta americana</i>	Cudweed	Asteraceae	0.1	1	*		No		
rume sagi	<i>Rumex sagittatus</i>	Rambling Dock	Polygonaceae	0.1	1	*		No		
clem glyc	<i>Clematis glycinoides</i>	Headache Vine	Ranunculaceae	0.1	2		Other (OG)	No		
	#N/A	#N/A	#N/A			#N/A		FALSE	#N/A	#N/A
	#N/A	#N/A	#N/A			#N/A		FALSE	#N/A	#N/A

5. BAM plot 5 PCT 4050 Wetland shrubby

BAM Site Field Survey							
Project:	Wolumla Junor	Plot Identifier	5	Pic 20x20		Pic 20x50	
Survey date:	23/10/2023	Compass Orientation (head of 20x20 plot)				70	
Recorders	JM EL	PCT:	4050	Wetland shrubby		Elevation	160m
GPS Easting	750099	GPS Northing	5920001	Datum	GDA	Zone	55
Landform			Soils		Drainage & Slope		
Morphology	open drainage depression		Soil Texture		Slope	1	
LandF Element			Soil Colour		Aspect	250	
LandF Pattern			Soil Depth	shallow	Drainage	poor	
Microrelief			Geology	granite	Watercourses	50m dam in gully	
Plot Disturbance							
	Severity	Age	Observational Evidence				
Clearing	3	O					
Cultivation	0						
Soil erosion	0						
Firewood	0						
Grazing	0		historical				
Fire Damage	0						
Storm Damage	0						
Weediness	2						
Other	2	O	dieback - old drought kill of Melaleuca				
Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)							
Additional information							
Current land use							
Age class of trees (DBH range) , Condition of Vegetation, Hollows							
Disturbances (i.e. fire, grazing, ferals, clearing, logging, soil degradation, pollution, weeds, dieback)							
Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)							
Dominant Species outside Plot							
FUNCTION							
Function attributes for		5					
BAM Attribute (20x20m plot)			BAM Attributes (1 x 1m Plots)				
Count of Native Richness	Stratum	Sum	Litter Cover	Tape length	% cover	Average %	Photos
	Tree (TG)	0		5m	5%		
	Shrub (SG)	1		15m	5%		
	Forb (FG)	7		25m	0%		
	Grass & grasslike (GG)	6		35m	0%		
	Fern (EG)	1		45m	0%		
	Other (OG)	0		5m	0%		
	TOTAL	15		15m	0%		
Count of cover abundance (native vascular plants)	BAM Attribute (20x20m plot)		Bare ground cover	25m	0%	1%	
	Stratum	Sum		35m	0%		
	Tree (TG)	5		45m	5%		
	Shrub (SG)	5					
	Forb (FG)	1.6	Cryptogam cover	5m	0%	0%	
	Grass & grasslike (GG)	73		15m	0%		
	Fern (EG)	3		25m	0%		
	Other (OG)	0		35m	0%		
	TOTAL Native	87.6	Rock Cover	45m	0%	0%	
	TOTAL 'HTE'	5.1		5m	0%		
		15m		0%			
		25m		0%			
			35m	0%			
			45m	0%			
BAM Attribute (20 x 50m plot) Tree Stem Counts							
DBH (cm)	Euc	Non Euc	Hollows				
>80	0		0				
50-79	1						
30-49	0						
20-29	0	1					
10-19	0						
5-9	0						
<5	0	3	N/A				
Length of logs (m)	0						

COMPOSITION & STRUCTURE										
Species recorded for										
Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
Sali	<i>Salix spp.</i>		Salicaceae	5	1	*		HTE		
mela eric	<i>Melaleuca ericifolia</i>	Swamp Paperbark	Myrtaceae	5	20		Shrub (SG)	No		
rubu frut	<i>Rubus fruticosus sp. ag</i>	Blackberry complex	Rosaceae	1	6	*		No		
euca ovat	<i>Eucalyptus ovata</i>	Swamp Gum	Myrtaceae	5	1		Tree (TG)	No		
blec minu	<i>Blechnum minus</i>	Soft Water Fern	Blechnaceae	3	10		Fern (EG)	No		
phra aust	<i>Phragmites australis</i>	Common Reed	Poaceae	40	500		Grass & grasslike (GG)	No		
holc lana	<i>Holcus lanatus</i>	Yorkshire Fog	Poaceae	3	100	*		No		
isac glob	<i>Isachne globosa</i>	Swamp Millet	Poaceae	10	100		Grass & grasslike (GG)	No		
anth odor	<i>Anthoxanthum odorat</i>	Sweet Vernal Grass	Poaceae	30	500	*		No		
poa prat	<i>Poa pratensis</i>	Kentucky Bluegrass	Poaceae	0.1	1	*		No		
care appr	<i>Carex appressa</i>	Tall Sedge	Cyperaceae	10	50		Grass & grasslike (GG)	No		
care gaud	<i>Carex gaudichaudiana</i>		Cyperaceae	5	500		Grass & grasslike (GG)	No		
eleo acut	<i>Eleocharis acuta</i>		Cyperaceae	5	500		Grass & grasslike (GG)	No		
isol prol	<i>Isolepis prolifera</i>		Cyperaceae	2	100	*		No		
junc subs	<i>Juncus subsecundus</i>	Finger Rush	Juncaceae	3	50		Grass & grasslike (GG)	No		
junc arti	<i>Juncus articulatus</i>	A Rush	Juncaceae	0.1	1	*		No		
lyth Sali	<i>Lythrum salicaria</i>	Purple Loosestrife	Lythraceae	0.5	50		Forb (FG)	No		
epil	<i>Epilobium spp.</i>		Onagraceae	0.2	50		Forb (FG)	No		
gera home	<i>Geranium spp.</i>		Geraniaceae	0.1	5		Forb (FG)	No		
ranu inun	<i>Ranunculus inundatus</i>	River Buttercup	Ranunculaceae	0.5	100		Forb (FG)	No		
hydr sibt	<i>Hydrocotyle sibthorpio</i>		Apiaceae	0.1	1		Forb (FG)	No		
hype japo	<i>Hypericum japonicum</i>		Clusiaceae	0.1	1		Forb (FG)	No		
plan lanc	<i>Plantago lanceolata</i>	Lamb's Tongues	Plantaginaceae	0.1	2	*		No		
verb bona	<i>Verbena bonariensis</i>	Purpletop	Verbenaceae	0.1	1	*		No		
trif repe	<i>Trifolium repens</i>	White Clover	Fabaceae	0.1	2	*		No		
rume	<i>Rumex spp.</i>	Dock	Polygonaceae	0.1	1	*	Forb (FG)	No		
sene mada	<i>Senecio madagascari</i>	Fireweed	Asteraceae	0.1	1	*		HTE		
	#N/A	#N/A	#N/A			#N/A		FALSE	#N/A	#N/A
	#N/A	#N/A	#N/A			#N/A		FALSE	#N/A	#N/A

6. BAM plot 6 PCT 4050 Wetland

BAM Site Field Survey									
Project:	Wolumla Junor	Plot Identifier	6	Pic 20x20		Pic 20x50			
Survey date:	23/10/2023		Compass Orientation (head of 20x20 plot)				70		
Recorders	JM EL		PCT:	4050	Wetland		Elevation	300	
GPS Easting	750087	GPS Northing	5919886		Datum	GDA	Zone	55	
Landform			Soils			Drainage & Slope			
Morphology	open drainage depression		Soil Texture			Slope	1		
LandF Element			Soil Colour			Aspect	285		
LandF Pattern			Soil Depth	shallow		Drainage	moderate		
Microrelief			Geology	granite		Watercourses	50m dam in gully		
Plot Disturbance									
	Severity	Age	Observational Evidence						
Clearing	3	O							
Cultivation	0								
Soil erosion	0								
Firewood	0								
Grazing	2		not current						
Fire Damage	0								
Storm Damage	0								
Weediness	2								
Other	0								
Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)									
Additional information									
Current land use									
Age class of trees (DBH range) , Condition of Vegetation, Hollows									
Disturbances (i.e. fire, grazing, ferals, clearing, logging, soil degradation, pollution, weeds, dieback)									
Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)									
Dominant Species outside Plot									

FUNCTION

Function attributes for			6						
BAM Attribute (20x20m plot)			BAM Attributes (1 x 1m Plots)						
Count of Native Richness	Stratum	Sum			Litter Cover	Tape length	% cover	Average %	Photos
	Tree (TG)	0				5m	5%	2.00%	
	Shrub (SG)	0				15m	0%		
	Forb (FG)	0				25m	5%		
	Grass & grasslike (GG)	4				35m	0%		
	Fern (EG)	0			45m	0%			
	Other (OG)	0							
	TOTAL	4							
BAM Attribute (20x20m plot)					Bare ground cover	5m	0%	0%	
Count of cover abundance (native vascular plants)	Stratum	Sum				15m	0%		
	Tree (TG)	0				25m	0%		
	Shrub (SG)	0				35m	0%		
	Forb (FG)	0				45m	0%		
	Grass & grasslike (GG)	43.1			Cryptogam cover	5m	0%	0%	
	Fern (EG)	0				15m	0%		
	Other (OG)	0				25m	0%		
	TOTAL Native	43.1				35m	0%		
TOTAL 'HTE'	0.9			Rock Cover	45m	0%	0%		
					5m	0%			
					15m	0%			
					25m	0%			
							</		

COMPOSITION & STRUCTURE

Species recorded for		6								
Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
rubu frut	<i>Rubus fruticosus</i> sp. ag	Blackberry complex	Rosaceae	0.2	4	*		HTE		
junc subs	<i>Juncus subsecundus</i>	Finger Rush	Juncaceae	40	100		Grass & grasslike (GG)	No		
eleo acut	<i>Eleocharis acuta</i>		Cyperaceae	2	1000		Grass & grasslike (GG)	No		
junc pris	<i>Juncus prismatocarpus</i>		Juncaceae	0.1	1		Grass & grasslike (GG)	No		
care appr	<i>Carex appressa</i>	Tall Sedge	Cyperaceae	1	3		Grass & grasslike (GG)	No		
holc lana	<i>Holcus lanatus</i>	Yorkshire Fog	Poaceae	50	1000	*		No		
anth odor	<i>Anthoxanthum odorat</i>	Sweet Vernal Grass	Poaceae	10	5000	*		No		
poa	<i>Poa</i> spp.		Poaceae	0.1	5	*		No		
cenc clan	<i>Cenchrus clandestinus</i>	Kikuyu Grass	Poaceae	0.5	1	*		HTE		
pasp dila	<i>Paspalum dilatatum</i>	Paspalum	Poaceae	0.1	1	*		HTE		
rume	<i>Rumex</i> spp.	Dock	Polygonaceae	0.2	10	*		No		
verb bona	<i>Verbena bonariensis</i>	Purpletop	Verbenaceae	0.2	10	*		No		
trif repe	<i>Trifolium repens</i>	White Clover	Fabaceae (F)	0.2	5	*		No		
cony suma	<i>Conyza sumatrensis</i>	Tall fleabane	Asteraceae	0.1	1	*		No		
sene mada	<i>Senecio madagascariensis</i>	Fireweed	Asteraceae	0.1	1	*		HTE		
	#N/A	#N/A	#N/A			#N/A		FALSE	#N/A	#N/A
	#N/A	#N/A	#N/A			#N/A		FALSE	#N/A	#N/A

7. BAM plot 7 PCT 3332 Exotic pasture

BAM Site Field Survey							
Project:	Wolumla Junor	Plot Identifier	7	Pic 20x20		Pic 20x50	
Survey date:	23/10/2023	Compass Orientation (head of 20x20 plot)				120	
Recorders	JM EL	PCT:	3332	exotic pasture			
GPS Easting	749953	GPS Northing	5919893	Datum	GDA	Zone	55
Landform		Soils		Drainage & Slope			
Morphology	open drainage depression		Soil Texture		Slope	1	
LandF Element		Soil Colour		Aspect	285		
LandF Pattern		Soil Depth	shallow	Drainage	moderate		
Microrelief		Geology	granite	Watercourses	50m dam in gully		
Plot Disturbance							
	Severity	Age	Observational Evidence				
Clearing	3	O					
Cultivation	3						
Soil erosion	0						
Firewood	0						
Grazing	3	R	lots of cow manure				
Fire Damage	0						
Storm Damage	0						
Weediness	3						
Other	0						
Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)							
Additional information							
Current land use							
Age class of trees (DBH range) , Condition of Vegetation, Hollows							
Disturbances (i.e. fire, grazing, ferals, clearing, logging, soil degradation, pollution, weeds, dieback)							
Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)							
Dominant Species outside Plot							

FUNCTION			
Function attributes for		7	
BAM Attribute (20x20m plot)		BAM Attributes (1 x 1m Plots)	
Count of Native Richness	Stratum	Sum	
	Tree (TG)	0	
	Shrub (SG)	0	
	Forb (FG)	0	
	Grass & grasslike (GG)	1	
	Fern (EG)	0	
	Other (OG)	0	
	TOTAL	1	
BAM Attribute (20x20m plot)			
Count of cover abundance (native vascular plants)	Stratum	Sum	
	Tree (TG)	0	
	Shrub (SG)	0	
	Forb (FG)	0	
	Grass & grasslike (GG)	0.1	
	Fern (EG)	0	
	Other (OG)	0	
	TOTAL Native	0.1	
TOTAL 'HTE'		96.1	
BAM Attribute (20 x 50m plot) Tree Stem Counts			
DBH (cm)	Euc	Non Euc	Hollows
>80	0		0
50-79	0		
30-49	0		
20-29	0		
10-19	0		
5-9	0		
<5	0		N/A
Length of logs (m)		0	

Litter Cover	Tape length	% cover	Average %	Photos
	5m	70%		
	15m	80%		
	25m	80%		
	35m	90%		
Bare ground cover	45m	80%	0%	
	5m	0%		
	15m	0%		
	25m	0%		
	35m	0%		
Cryptogam cover	45m	0%	0%	
	5m	0%		
	15m	0%		
	25m	0%		
	35m	0%		
Rock Cover	45m	0%	0%	
	5m	0%		
	15m	0%		
	25m	0%		
	35m	0%		

COMPOSITION & STRUCTURE									
Species recorded for									
Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status/BCA Status
cenc clan	<i>Cenchrus clandestinus</i>	Kikuyu Grass	Poaceae	95	1000	*		HTE	
erag curv	<i>Eragrostis curvula</i>	African Lovegrass	Poaceae	1	20	*		HTE	
anth odor	<i>Anthoxanthum odorat</i>	Sweet Vernal Grass	Poaceae	0.1	5	*		No	
junc	<i>Juncus spp.</i>	A Rush	Juncaceae	0.1	3		Grass & grasslike (GG)	No	
hypo radi	<i>Hypochaeris radicata</i>	Catsear	Asteraceae	1	150	*		No	
plan lanc	<i>Plantago lanceolata</i>	Lamb's Tongues	Plantaginaceae	0.1	5	*		No	
sene mada	<i>Senecio madagascari</i>	Fireweed	Asteraceae	0.1	1	*		HTE	
leon saxa	<i>Leontodon saxatilis</i>	Lesser Hawkbit, Ha	Asteraceae	0.1	5	*		No	
	#N/A	#N/A	#N/A			#N/A			#N/A #N/A
	#N/A	#N/A	#N/A			#N/A		FALSE	#N/A #N/A
	#N/A	#N/A	#N/A			#N/A		FALSE	#N/A #N/A
	#N/A	#N/A	#N/A			#N/A		FALSE	#N/A #N/A
	#N/A	#N/A	#N/A			#N/A		FALSE	#N/A #N/A

8. BAM Plot 8 PCT 3332 Wet exotic pasture

BAM Site Field Survey									
Project:	Wolumla Junor	Plot Identifier	8	Pic 20x20		Pic 20x50			
Survey date:	23/10/2023			Compass Orientation (head of 20x20 plot)				30	
Recorders	JM EL		PCT:	3332	Wet exotic pasture				
GPS Easting	749844	GPS Northing	5919221		Datum	GDA	Zone	55	
Landform			Soils			Drainage & Slope			
Morphology	lower slope		Soil Texture			Slope	2		
LandF Element			Soil Colour			Aspect	330		
LandF Pattern			Soil Depth	shallow		Drainage			
Microrelief			Geology	granite		Watercourses	50m ephemeral gully		
Plot Disturbance									
	Severity	Age	Observational Evidence						
Clearing	3	O							
Cultivation	2	O							
Soil erosion	0								
Firewood	0								
Grazing	2								
Fire Damage	0								
Storm Damage	0								
Weediness	3								
Other	0								
Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)									
Additional information									
Current land use									
Age class of trees (DBH range) , Condition of Vegetation, Hollows									
Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)									
Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)									
Dominant Species outside Plot									
Lower slope seepage area, much the same veg as in most of the gullies, except for the TEC area; ie, exotic pasture with high % cover of Juncus, but <50% native cover									

FUNCTION		
Function attributes for		8
BAM Attribute (20x20m plot)		
Count of Native Richness	Stratum	Sum
	Tree (TG)	0
	Shrub (SG)	0
	Forb (FG)	2
	Grass & grasslike (GG)	5
	Fern (EG)	0
	Other (OG)	0
	TOTAL	7
BAM Attribute (20x20m plot)		
Count of cover abundance (native vascular plants)	Stratum	Sum
	Tree (TG)	0
	Shrub (SG)	0
	Forb (FG)	0.2
	Grass & grasslike (GG)	40.8
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	41
	TOTAL 'HTE'	30.2

BAM Attributes (1 x 1m Plots)				
Litter Cover	Tape length	% cover	Average %	Photos
	5m	10%	11.00%	
	15m	10%		
	25m	5%		
35m	10%			
Bare ground cover	45m	20%	0%	
	5m	0%		
	15m	0%		
	25m	0%		
Cryptogam cover	35m	0%	0%	
	45m	0%		
	5m	0%		
	15m	0%		
Rock Cover	25m	0%	0%	
	35m	0%		
	45m	0%		
	5m	0%		

BAM Attribute (20 x 50m plot) Tree Stem Counts			
DBH (cm)	Euc	Non Euc	Hollows
>80	0		0
50-79	0		
30-49	0		
20-29	0		
10-19	0		
5-9	0		
<5	0		N/A
Length of logs (m)		0	

COMPOSITION & STRUCTURE										
Species recorded for 8										
Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
eleo acut	<i>Eleocharis acuta</i>		Cyperaceae	0.1	20		Grass & grasslike (GG)	No		
junc subs	<i>Juncus subsecundus</i>	Finger Rush	Juncaceae	40	200		Grass & grasslike (GG)	No		
junc pris	<i>Juncus prismatocarpus</i>		Juncaceae	0.1	1		Grass & grasslike (GG)	No		
care appr	<i>Carex appressa</i>	Tall Sedge	Cyperaceae	0.5	5		Grass & grasslike (GG)	No		
cenc clan	<i>Cenchrus clandestinus</i>	Kikuyu Grass	Poaceae	30	1000	*		HTE		
anth odor	<i>Anthoxanthum odorat</i>	Sweet Vernal Grass	Poaceae	10	500	*		No		
holc lana	<i>Holcus lanatus</i>	Yorkshire Fog	Poaceae	20	1000	*		No		
pasp dila	<i>Paspalum dilatatum</i>	Paspalum	Poaceae	0.1	5	*		HTE		
cyno dact	<i>Cynodon dactylon</i>	Common Couch	Poaceae	0.1	1		Grass & grasslike (GG)	No		
trif repe	<i>Trifolium repens</i>	White Clover	Fabaceae (Fa)	0.1	5	*		No		
plan lanc	<i>Plantago lanceolata</i>	Lamb's Tongues	Plantaginaceae	0.1	5	*		No		
hypo radi	<i>Hypochaeris radicata</i>	Catsear	Asteraceae	0.1	5	*		No		
verb bona	<i>Verbena bonariensis</i>	Purpletop	Verbenaceae	0.1	1	*		No		
cirs vulg	<i>Cirsium vulgare</i>	Spear Thistle	Asteraceae	0.1	1	*		No		
sene mada	<i>Senecio madagascariensis</i>	Fireweed	Asteraceae	0.1	3	*		HTE		
rume	<i>Rumex spp.</i>	Dock	Polygonaceae	0.1	1	*		No		
lotu subb	<i>Lotus subbiflorus</i>	Hairy Birds-foot Tree	Fabaceae (Fa)	0.1	1	*		No		
pers deci	<i>Persicaria decipiens</i>	Slender Knotweed	Polygonaceae	0.1	1		Forb (FG)	No		
epil	<i>Epilobium spp.</i>		Onagraceae	0.1	1		Forb (FG)	No		
	#N/A	#N/A	#N/A			#N/A		FALSE	#N/A	#N/A
	#N/A	#N/A	#N/A			#N/A		FALSE	#N/A	#N/A

9. BAM plot 9 PCT 3183 Regrowth forest

BAM Site Field Survey							
Project:	Wolumla Junor	Plot Identifier	9	Pic 20x20		Pic 20x50	
Survey date:	23/10/2023	Compass Orientation (head of 20x20 plot)				285	
Recorders	JM EL	PCT:	3183	regrowth forest			
GPS Easting	750325	GPS Northing	5919120	Datum	GDA	Zone	55
Landform		Soils		Drainage & Slope			
Morphology	mid-slope	Soil Texture		Slope	25		
LandF Element		Soil Colour		Aspect	285		
LandF Pattern		Soil Depth	skeletal	Drainage	well drained		
Microrelief		Geology	sedimentary	Watercourses	200m small dam		
Plot Disturbance							
	Severity	Age	Observational Evidence				
Clearing	3	O	trees are young, sparse				
Cultivation	0						
Soil erosion	0						
Firewood	0						
Grazing	1						
Fire Damage	0						
Storm Damage	0						
Weediness	1						
Other	0						
Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)							
Additional information							
Current land use							
Age class of trees (DBH range) , Condition of Vegetation, Hollows							
Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)							
Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)							
Dominant Species outside Plot							
FUNCTION							
Function attributes for		9					
BAM Attribute (20x20m plot)			BAM Attributes (1 x 1m Plots)				
Count of Native Richness	Stratum	Sum	Litter Cover	Tape length	% cover	Average %	Photos
	Tree (TG)	2		5m	30%		
	Shrub (SG)	3		15m	30%		
	Forb (FG)	2		25m	10%		
	Grass & grasslike (GG)	3		35m	10%		
	Fern (EG)	2		45m	10%		
	Other (OG)	0					
	TOTAL	12					
BAM Attribute (20x20m plot)			Bare ground cover				
Count of cover abundance (native vascular plants)	Stratum	Sum	Cryptogam cover	5m	5%	24%	
	Tree (TG)	2		15m	10%		
	Shrub (SG)	1.6		25m	5%		
	Forb (FG)	0.2		35m	20%		
	Grass & grasslike (GG)	98.2		45m	80%		
	Fern (EG)	0.2					
	Other (OG)	0					
	TOTAL Native	102.2					
BAM Attribute (20 x 50m plot) Tree Stem Counts			Rock Cover				
DBH (cm)	Euc	Non Euc					
>80	0		0				
50-79	0						
30-49	0						
20-29	0						
10-19	1						
5-9	2						
<5	34		N/A				
Length of logs (m)		0					

COMPOSITION & STRUCTURE										
Species recorded for										
Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
euca muel	<i>Eucalyptus muelleriana</i>	Yellow Stringybark	Myrtaceae	1	8		Tree (TG)	No		
euca sieb	<i>Eucalyptus sieberi</i>	Silvertop Ash	Myrtaceae	1	5		Tree (TG)	No		
acac mear	<i>Acacia mearnsii</i>	Black Wattle	Fabaceae (M)	1	5		Shrub (SG)	No		
kunz eric	<i>Kunzea ericoides</i>	Burgan	Myrtaceae	0.5	6		Shrub (SG)	No		
acac impl	<i>Acacia implexa</i>	Hickory Wattle	Fabaceae (M)	0.1	1		Shrub (SG)	FALSE		
them tria	<i>Themeda triandra</i>		Poaceae	98	1000		Grass & grasslike (GG)	No		
erag curv	<i>Eragrostis curvula</i>	African Lovegrass	Poaceae	0.2	10	*		HTE		
dich micr	<i>Dichelachne micrantha</i>	Shorthair Plumegrass	Poaceae	0.1	1		Grass & grasslike (GG)	No		
loma mult mult	<i>Lomandra multiflora</i>	Many-flowered Mat	Lomandraceae	0.1	4		Grass & grasslike (GG)	No		
wahl grac	<i>Wahlenbergia gracilis</i>	Annual Bluebell	Campanulaceae	0.1	1		Forb (FG)	No		
hype gram	<i>Hypericum gramineum</i>	Small St John's Wort	Clusiaceae	0.1	1		Forb (FG)	No		
chei sieb	<i>Cheilanthes sieberi</i>	Rock Fern	Pteridaceae	0.1	50		Fern (EG)	No		
pter escu	<i>Pteridium esculentum</i>	Bracken	Dennstaedtiaceae	0.1	1		Fern (EG)	No		
hypo radi	<i>Hypochaeris radicata</i>	Catsear	Asteraceae	0.1	5	*		No		
gamo coar	<i>Gamochaeta coarctata</i>		Asteraceae	0.1	1	*		No		
sene mada	<i>Senecio madagascariensis</i>	Fireweed	Asteraceae	0.1	5	*		HTE		
gamo calv	<i>Gamochaeta calviceps</i>	Cudweed	Asteraceae	0.1	1	*		No		
rume acet	<i>Rumex acetosella</i>	Sheep Sorrel	Polygonaceae	0.1	10	*		No		
	#N/A	#N/A	#N/A			#N/A		FALSE	#N/A	#N/A
	#N/A	#N/A	#N/A			#N/A		FALSE	#N/A	#N/A

10. BAM plot 10 PCT 3332 Overstorey only

BAM Site Field Survey									
Project:	wolimla junor	Plot Identifier	10	Pic 20x20	10.31	Pic 20x50	11.32		
Survey date:	3.11.23	Compass Orientation (head of 20x20 plot)					335 nnw		
Recorders	T Hastings J Shields	PCT:	3332	Overstorey only					
GPS Easting	749862	GPS Northing	5919030	Datum	gda94	Zone	55		
Landform		Soils							
Morphology		Soil Texture	loam	Slope	2				
LandF Element	alluvial flat	Soil Colour	brown	Aspect	undulating N				
LandF Pattern		Soil Depth	unknown	Drainage	yes				
Microrelief		Geology	granite	Watercourses	depressions in plot				
Plot Disturbance									
	Severity	Age	Observational Evidence						
Clearing	2%								
Cultivation	1								
Soil erosion	0								
Firewood	0								
Grazing	3	R							
Fire Damage	0								
Storm Damage	1	R	Broken branches on ground						
Weediness	1								
Other	0								
Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)									
Additional information									
Current land use									
Age class of trees (DBH range) , Condition of Vegetation, Hollows									
Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)									
Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)									
Dominant Species outside Plot									

FUNCTION								
Function attributes for		10						
BAM Attribute (20x20m plot)			BAM Attributes (1 x 1m Plots)					
Count of Native Richness	Stratum	Sum		Litter Cover	Tape length	% cover	Average %	Photos
	Tree (TG)	1			5m	15%	9.00%	11.26
	Shrub (SG)	0			15m	10%		11.27
	Forb (FG)	0			25m	10%		11.29
	Grass & grasslike (GG)	0			35m	5%		11.3
	Fern (EG)	1			45m	5%	11.32	
	Other (OG)	0						
	TOTAL	2						
BAM Attribute (20x20m plot)								
Count of cover abundance (native vascular plants)	Stratum	Sum		Bare ground cover	5m	0%	1%	
	Tree (TG)	25			15m	0%		
	Shrub (SG)	0			25m	5%		
	Forb (FG)	0			35m	0%		
	Grass & grasslike (GG)	0		45m	0%			
	Fern (EG)	0.1		Cryptogam cover	5m	0%	0%	
	Other (OG)	0			15m	0%		
	TOTAL Native	25.1			25m	0%		
	TOTAL 'HTE'	99.1			35m	0%		
			45m	0%				
			Rock Cover	5m	0%	0%		
				15m	0%			
				25m	0%			
				35m	0%			
			45m	1%				

BAM Attribute (20 x 50m plot) Tree Stem Counts			
DBH (cm)	Euc	Non Euc	Hollows
>80	3		3
50-79	1		
30-49			
20-29			
10-19			
5-9			
<5			N/A
Length of logs (m)		10	

COMPOSITION & STRUCTURE										
Species recorded for			10							
Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
euca muel	<i>Eucalyptus muelleriana</i>	Yellow Stringybark	Myrtaceae	25	1		Tree (TG)	No		
rume	<i>Rumex spp.</i>	Dock	Polygonaceae	0.1	5	*		No		
cirs vulg	<i>Cirsium vulgare</i>	Spear Thistle	Asteraceae	0.1	3	*		No		
cenc clan	<i>Cenchrus clandestinus</i>	Kikuyu Grass	Poaceae	98	1000	*		HTE		
hypo radi	<i>Hypochaeris radicata</i>	Catsear	Asteraceae	0.1	10	*		No		
sida rhom	<i>Sida rhombifolia</i>	Paddy's Lucerne	Malvaceae	0.1	1	*		No		
sene mada	<i>Senecio madagascariensis</i>	Fireweed	Asteraceae	0.1	1	*		HTE		
erag curv	<i>Eragrostis curvula</i>	African Lovegrass	Poaceae	1	50	*		HTE		
gera moll moll	<i>Geranium molle</i> subsp.	Cranesbill Geranium	Geraniaceae	0.1	1	*		No		
trif repe	<i>Trifolium repens</i>	White Clover	Fabaceae (Fa)	0.1	20	*		No		
	#N/A	#N/A	#N/A			#N/A		FALSE	#N/A	#N/A
	#N/A	#N/A	#N/A			#N/A		FALSE	#N/A	#N/A

COMPOSITION & STRUCTURE

Species recorded for 11										
Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
pter escu	<i>Pteridium esculentum</i>	Bracken	Dennstaedti	5	100		Fern (EG)	No		
them tria	<i>Themeda triandra</i>	Kangaroo Grass	Poaceae	50	500		Grass & grasslike (GG)	No		
euca sieb	<i>Eucalyptus sieberi</i>	Silvertop Ash	Myrtaceae	20	4		Tree (TG)	No		
ozot dios	<i>Ozothamnus diosmifol</i>	White Dogwood	Asteraceae	1	2		Shrub (SG)	No		
acac mear	<i>Acacia mearnsii</i>	Black Wattle	Fabaceae (M	5	2		Shrub (SG)	No		
chei aust	<i>Cheilanthes austrotent</i>	Rock Fern	Pteridaceae	0.1	1		Fern (EG)	No		
kunz eric	<i>Kunzea ericoides</i>	Burgan	Myrtaceae	5	4		Shrub (SG)	No		
loma long	<i>Lomandra longifolia</i>	Spiny-headed Mat	Lomandrace	0.1	5		Grass & grasslike (GG)	No		
erag curv	<i>Eragrostis curvula</i>	African Lovegrass	Poaceae	10	1	*		HTE		
indi aust	<i>Indigofera australis</i>	Australian Indigo	Fabaceae (F	0.1	2		Shrub (SG)	No		
wahl grac	<i>Wahlenbergia gracilen</i>	Annual Bluebell	Campanulac	0.1	2		Forb (FG)	No		
	#N/A	#N/A	#N/A			#N/A		FALSE	#N/A	#N/A
	#N/A	#N/A	#N/A			#N/A		FALSE	#N/A	#N/A

12. BAM plot 12 PCT 3332 Wet exotic pasture

BAM Site Field Survey							
Project:	Wolumla Junior	Plot Identifier	12	Pic 20x20		Pic 20x50	
Survey date:	23/11/2023	Compass Orientation (head of 20x20 plot)				165	
Recorders	EL AP	PCT:	3332	wet exotic pasture			
GPS Easting	749861	GPS Northing	5919376	Datum	GDA	Zone	55
Landform		Soils		Drainage & Slope			
Morphology	lower slope	Soil Texture		Slope	2		
LandF Element		Soil Colour		Aspect	330		
LandF Pattern		Soil Depth	shallow	Drainage			
Microrelief		Geology	granite	Watercourses	30m ephemeral gully		
Plot Disturbance							
	Severity	Age	Observational Evidence				
Clearing	3	O					
Cultivation	3	O					
Soil erosion	1						
Firewood	0						
Grazing	3		Cattle, deer, Grey Kangaroos				
Fire Damage	0						
Storm Damage	0						
Weediness	2						
Other	0						
Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)							
Additional information							
Current land use							
Age class of trees (DBH range) , Condition of Vegetation, Hollows							
Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)							
Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)							
Dominant Species outside Plot							
Lower slope seepage area, much the same veg as in most of the gullies, except for the TEC area; ie, exotic pasture with high % cover of Juncus, but <50%							
Elevation 170m							

FUNCTION

Function attributes for		12						
BAM Attribute (20x20m plot)			BAM Attributes (1 x 1m Plots)					
Count of Native Richness	Stratum	Sum	Litter Cover	Tape length	% cover	Average %	Photos	
	Tree (TG)	0		5m	50%			
	Shrub (SG)	0		15m	10%			
	Forb (FG)	0		25m	20%			
	Grass & grasslike (GG)	4		35m	10%			
	Fern (EG)	0		45m	20%			
	Other (OG)	0						
	TOTAL	4						
BAM Attribute (20x20m plot)			Bare ground cover	5m	0%	0%		
Count of cover abundance (native vascular plants)	Stratum	Sum		15m	0%			
	Tree (TG)	0		25m	0%			
	Shrub (SG)	0		35m	0%			
	Forb (FG)	0		45m	0%			
	Grass & grasslike (GG)	43.1		5m	0%		0%	
	Fern (EG)	0		15m	0%			
	Other (OG)	0		25m	0%			
	TOTAL Native	43.1	35m	0%				
TOTAL 'HTE'	5.1	45m	0%					
BAM Attribute (20 x 50m plot) Tree Stem Counts			Rock Cover	5m	0%	0%		
DBH (cm)	Euc	Non Euc		Hollows	15m		0%	
>80	0			0	25m		0%	
50-79	0				35m		0%	
30-49	0				45m		0%	
20-29	0							
10-19	0							
5-9	0							
<5	0		N/A					
Length of logs (m)		0						

COMPOSITION & STRUCTURE

Species recorded for			12							
Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
junc subs	<i>Juncus subsecundus</i>	Finger Rush	Juncaceae	40	200		Grass & grasslike (GG)	No		
junc prism	<i>Juncus prismatocarpus</i>	Branching Rush	Juncaceae	2	100		Grass & grasslike (GG)	No		
cenc clan	<i>Cenchrus clandestinus</i>	Kikuyu Grass	Poaceae	5	200	*		HTE		
anth odor	<i>Anthoxanthum odorat</i>	Sweet Vernal Grass	Poaceae	10	500	*		No		
holc lana	<i>Holcus lanatus</i>	Yorkshire Fog	Poaceae	40	2000	*		No		
cyno dact	<i>Cynodon dactylon</i>	Common Couch	Poaceae	1	10		Grass & grasslike (GG)	No		
poa meio	<i>Poa meionectes</i>	Fine-leaved Snow G	Poaceae	0.1	2		Grass & grasslike (GG)	No		
trif repe	<i>Trifolium repens</i>	White Clover	Fabaceae (Fa)	0.1	5	*		No		
trif sp	<i>Trifolium sp</i>	Clover	Fabaceae (Fa)	0.1	5	*		No		
plan lanc	<i>Plantago lanceolata</i>	Lamb's Tongues	Plantaginaceae	0.1	10	*		No		
hypo radi	<i>Hypochaeris radicata</i>	Catsear	Asteraceae	0.1	20	*		No		
rume	<i>Rumex spp.</i>	Dock	Polygonaceae	0.2	10	*		No		
lotu subb	<i>Lotus subbiflorus</i>	Hairy Birds-foot Tre	Fabaceae (Fa)	0.1	1	*		No		
rubu fruti	<i>Rubus fruticosus agg.</i>	European Blackberry	Rosaceae	0.1	1	*	Shrub	HTE	#N/A	#N/A
	#N/A	#N/A	#N/A			#N/A		FALSE	#N/A	#N/A
	#N/A	#N/A	#N/A			#N/A		FALSE	#N/A	#N/A
	#N/A	#N/A	#N/A			#N/A		FALSE	#N/A	#N/A

APPENDIX G BAM PLOT PHOTOS

1. BAM plot 1 PCT 3332 Exotic pasture



2. BAM plot 2 PCT 4050 Wetland



3. BAM plot 3 PCT 3183 Native pasture



4. BAM plot 4 PCT 3183 Forest



5. BAM plot 5 PCT 4050 Wetland shrubby



6. BAM plot 6 PCT 4050 Wetland



7. BAM plot 7 Exotic pasture



8. BAM plot 8 PCT 3332 Wet exotic pasture



9. BAM plot 9 PCT 3183 Regrowth forest



10. BAM plot 10 PCT 3332 Overstorey only



11. BAM plot 11 PCT 3183 Regrowth forest



12. BAM plot 12 PCT 3332 Wet exotic pasture



APPENDIX H MATTERS OF NATIONAL SIGNIFICANCE



Australian Government
Department of Climate Change, Energy,
the Environment and Water

EPBC Act Protected Matters Report

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

Report created: 07-Apr-2025

[Summary](#)

[Details](#)

[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)

Summary

Matters of National Environment Significance

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

World Heritage Properties:	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:	86
Listed Migratory Species:	38

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:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	54
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:	4
Regional Forest Agreements:	1
Nationally Important Wetlands:	1
EPBC Act Referrals:	4
Key Ecological Features (Marine):	None
Biologically Important Areas:	1
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
Brogo Vine Forest of the South East Corner Bioregion	Endangered	Community likely to occur within area	In feature area
Lowland Grassy Woodland in the South East Corner Bioregion	Critically Endangered	Community likely to occur within area	In feature area
Natural Temperate Grassland of the South Eastern Highlands	Critically Endangered	Community may occurIn buffer area only within area	
River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria	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

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
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Botaerus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	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 known to occur within area	In feature area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat known to occur within area	In feature area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat may occur within area	In buffer area only
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat 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]	Endangered	Species or species habitat known 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

Scientific Name	Threatened Category	Presence Text	Buffer Status
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 likely to occur within area	In feature area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	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
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Pycnoptilus floccosus Pilotbird [525]	Vulnerable	Species or species habitat known to occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area	In feature area
Sternula albifrons Little Tern [82849]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat may occur within area	In feature area

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 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	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour 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 melanophrys 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	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Thinornis cucullatus cucullatus Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area	In buffer area only
FISH			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Epinephelus daemeli Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat known to occur within area	In feature area
FROG			
Heleioporus australiacus flavopunctatus Southern Owl Frog, Southern Giant Burrowing Frog [92014]	Endangered	Species or species habitat known to occur within area	In feature area
Litoria aurea Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Litoria raniformis Southern Bell Frog, Growling Grass Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Litoria watsoni Southern Heath Frog, Watson's Tree Frog [91509]	Endangered	Species or species habitat may occur within area	In feature area
Mixophyes balbus Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	Vulnerable	Species or species habitat may occur within area	In feature area
MAMMAL			
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area	In feature area
Isopodon obesulus obesulus Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern) [68050]	Endangered	Species or species habitat known to 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

Scientific Name	Threatened Category	Presence Text	Buffer Status
Phascogale cinerea (combined populations of Qld, NSW and the ACT)			
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat likely to occur within area	In feature area
Potorous tridactylus trisulcatus			
Long-nosed Potoroo (southern mainland) [86367]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pseudomys fumeus			
Smoky Mouse, Konoom [88]	Endangered	Species or species habitat likely to occur within area	In feature area
Pseudomys novaehollandiae			
New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat may occur within area	In feature area
Pteropus poliocephalus			
Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area	In feature area
PLANT			
Acacia georgensis			
Bega Wattle [9848]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Amphibromus fluitans			
River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Astrotricha crassifolia			
Thick-leaf Star-hair [10352]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Caladenia tessellata			
Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Calochilus pulchellus			
Pretty Beard Orchid, Pretty Beard-orchid [84677]	Endangered	Species or species habitat may occur within area	In buffer area only
Correa baeuerlenii			
Chefs Cap [17007]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Corunastylis rhyolitica listed as Genoplesium rhyoliticum			
Pambula Midge-orchid, Rhyolite Midge Orchid [78697]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Cryptostylis hunteriana			
Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area	In feature area
Glycine latrobeana			
Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Leionema ralstonii			
[64926]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Leucochrysum albicans subsp. tricolor			
Hoary Sunray, Grassland Paper-daisy [89104]	Endangered	Species or species habitat may occur within area	In buffer area only
Persicaria elatior			
Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Pomaderris cotoneaster			
Cotoneaster Pomaderris [2043]	Endangered	Species or species habitat likely to occur within area	In feature area
Pomaderris parrisiae			
Parris' Pomaderris [22119]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thesium australe			
Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Westringia davidii			
[19079]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Xerochrysum palustre			
Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Zieria buxijugum Box Range Zieria [56757]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only
Zieria parrisiae Parris's Zieria [56735]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only
REPTILE			
Aprasia parapulchella Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Natator depressus Flatback Turtle [59257]	Vulnerable	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			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour 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
Sternula albifrons Little Tern [82849]	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 cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status	Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only	Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat known to occur within area	In feature area
Thalassarche melanophrys Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only	Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only	Migratory Wetlands Species			
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only	Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Migratory Marine Species				Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area	In buffer area only	Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour 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
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area	In buffer area only	Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only	Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area	In buffer area only	Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only	Gallinago megala Swinhoe's Snipe [864]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Migratory Terrestrial Species				Gallinago stenura Pin-tailed Snipe [841]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In buffer area only
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

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
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Ardena grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	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]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	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 may occur within area overfly marine area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In feature area
Gallinago megala Swinhoe's Snipe [864]		Foraging, feeding or related behaviour likely to occur within area overfly marine area	In buffer area only
Gallinago stenura Pin-tailed Snipe [841]		Foraging, feeding or related behaviour likely to occur within area overfly marine area	In buffer area only
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
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known 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

Scientific Name	Threatened Category	Presence Text	Buffer Status
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
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In buffer area only
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat likely to 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
Numenius minutus Little Curlew, Little Whimbrel [848]		Foraging, feeding or related behaviour likely to occur within area overfly marine area	In buffer area only
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area	In buffer area only
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area	In buffer area only
Pterodroma cervicalis White-necked Petrel [59642]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
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
Sternula albifrons as Sterna albifrons Little Tern [82849]	Vulnerable	Species or species habitat may occur within area	In buffer area only
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
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	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour 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

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche melanophrys 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	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Thinornis cucullatus as Thinornis rubricollis Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Thinornis cucullatus cucullatus as Thinornis rubricollis rubricollis Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area overfly marine area	In buffer area only
Reptile			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Bournda	Nature Reserve	NSW	In buffer area only
Bournda	National Park	NSW	In buffer area only
South East Forest	National Park	NSW	In buffer area only
Yurammie	State Conservation Area	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
Eden RFA	New South Wales	In feature area

Nationally Important Wetlands		[Resource Information]
Wetland Name	State	Buffer Status
Merimbula Lake	NSW	In buffer area only

EPBC Act Referrals			[Resource Information]	
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Re-starting Bournda Quarry and extractive activities	2024/09785		Referral Decision	In buffer area only
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthm two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area
Not controlled action (particular manner)				

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action (particular manner)				
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area

Biologically Important Areas			[Resource Information]
Scientific Name	Behaviour	Presence	Buffer Status
Seabirds			
Thalassarche cauta cauta			
Shy Albatross [82345]	Foraging likely	Likely to occur	In buffer area only

Caveat

1 PURPOSE

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

The report contains the mapped locations of:

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

2 DISCLAIMER

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

Where data 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.

APPENDIX I HABITAT ASSESSMENT FOR EPBC ACT LISTED SPECIES

Candidate species for habitat assessment: EPBC Act Protected Matters Search Tool, 7 April 2025. Search buffer: 10 km. Aquatic, shoreline and marine species not included.

The likelihood of a species' occurrence is based on a consideration of presence of habitat, proximity of nearest records and mobility of the species. The evaluation considers the ecology and sensitivity of the species and all the available ecological information gathered on the Subject Land including the results of targeted flora and fauna surveys and threatened species habitat searches conducted over a period of eighteen months (June 2022 to December 2023).

The main references used for this habitat assessment were:

- Conservation Advice issued by the Threatened Species Committee established under the EPBC Act. Accessed at the Species Profiles and Threat Database (SPRAT), www.environment.gov.au/cgi-bin/sprat/public/sprat.pl
- National Recovery Plans, accessed online through SPRAT
- NSW Scientific Committee Determinations, www.environment.nsw.gov.au/topics/animals-and-plants/threatened-species/nsw-threatened-species-scientific-committee

Species, conservation status	Ecology, distribution, description of habitat	Habitat present	Likelihood of occurrence	Potential for impact?
Flora				
Austral Toadflax <i>Thesium australe</i> BC Act: V EPBC Act: V	Occurs in grassland and grassy woodland from Queensland to Victoria, mostly on the tablelands and slopes but with a few near-coastal occurrences in rainshadow valleys of the coast and on grassy headlands. There are only two records of this species in Bega Valley, and it is possible that neither currently exists due to habitat deterioration over the last 20 years or so (J. Miles, pers. obs.). It is a partial root parasite, principally on Kangaroo Grass. As Kangaroo Grass is very sparsely distributed on the subject land, and due to the history of grazing on site, Austral Toadflax is extremely unlikely to be present.	Possible Veg Zone 4	Unlikely Not detected during surveys	No – unlikely to occur on site
Tall Knotweed <i>Persicaria elatior</i> BC Act: V EPBC Act: V	Species of relatively undisturbed freshwater wetlands. Has been recorded in south-eastern NSW (Mt Dromedary (an old record), Moruya State Forest near Turlinjah, the Upper Avon River catchment north of Robertson, Cuttagee Creek (Bega Valley LGA), and Picton Lakes. Normally grows in damp places, especially beside streams and lakes.	Possible Veg Zones 1, 2	Unlikely Not detected during surveys	No – unlikely to occur on site

Species, conservation status	Ecology, distribution, description of habitat	Habitat present	Likelihood of occurrence	Potential for impact?
Flora				
Hoary Sunray <i>Leucochrysum albicans subsp. tricolor</i> BC Act: E EPBC Act: E	Hoary Sunray occurs outside the Bega Valley LGA on the Monaro, where it is patchily common on road verges, having preference for shallow soils with little competition with other vegetation. It was not detected in the Bega Valley in an extensive targeted survey held in 2002 of road verges in areas carrying suitable grassy woodland habitat (J. Miles, pers. obs.). Only the yellow flowered <i>L. albicans subsp. albicans</i> was recorded, in a single location near Candelo. <i>L. albicans subsp. tricolor</i> is unlikely to occur in areas with a history of regular grazing such as the Subject Land.	Possible Veg Zones 1-6	Unlikely Not detected during surveys	No – unlikely to occur on site
Cotoneaster Pomaderris <i>Pomaderris cotoneaster</i> BC Act: E EPBC Act: E	Locally this species is associated with rocky river beds and lower banks on Tantawangalo Creek. In other areas it may occur in elevated rocky areas which are not close to water, for example at Bungonia Gorge (J. Miles, pers. obs.). There is no such habitat on the Subject Land.	Absent	Unlikely Not detected during surveys	No – unlikely to occur on site
Parris Pomaderris <i>Pomaderris parrisiae</i> BC Act: V EPBC Act: V	Associated with skeletal soils in rocky shrubland or tall open forest chiefly on escarpment ranges. Has been recorded in Egan Peaks Nature Reserve, Wadbilliga National Park (near Wadbilliga Trig) and South East Forests National Park (Brown Mountain / Cochrane Dam area), with a questionable record in Ben Boyd National Park.	Absent	Unlikely Not detected during surveys	No – unlikely to occur on site
Parris Zieria <i>Zieria parrisiae</i> BC Act: CE EPBC Act: CE	Associated with skeletal soils overlying rhyolite rock. Known from only one population, which is split between two main patches located about 200 m apart in a gully about 15 km west of Pambula.	Absent	Unlikely	No - unlikely to occur on site
Box Range Zieria <i>Zieria buxijugum</i> BC Act: CE EPBC Act: CE	Associated with rhyolite rocky outcrops. Known from only one population which was about 125 plants in June 2015. The population occupies an area of about 0.25 hectares on private property about 15 km west of Pambula.	Absent	Unlikely	No - unlikely to occur on site
Shapely Zieria <i>Zieria formosa</i> BC Act: CE EPBC Act: E	Associated with skeletal, grey sandy loam with exposed surface rock. Known from only one population which occupies an area of about 1 ha located about 5 km west of Pambula.	Absent	Unlikely	No - unlikely to occur on site
Pretty Beard Orchid <i>Calochilus pulchellus</i> BC Act: CE EPBC Act: E	Associated with heathy habitat. All currently known sites are within the Shoalhaven Local Government Area. At Vincentia found in low Scribbly Gum dominated woodland with a low wet heath understorey, with sandy loamy soil overlying sandstone. In Booderee National Park it grows in a tall heathy association. In Morton National Park on the Little Forest Plateau it occurs in low heath among scattered clumps of emergent eucalypts and Banksia in shallow coarse white sand over sandstone.	Absent	Unlikely Not detected during surveys	No – unlikely to occur on site

Species, conservation status	Ecology, distribution, description of habitat	Habitat present	Likelihood of occurrence	Potential for impact?
Flora				
Leafless Tongue Orchid <i>Cryptostylis hunteriana</i> BC Act: V EPBC Act: V	Several sources were consulted for details of earlier records of this species on the far south coast and adjoining regions. Because of the threatened status of this species and the possibility of it being targeted by orchid collectors, precise locations of records have generally been concealed in the various databases in which it appears, which makes it difficult to predict the type of habitat in which it might occur. However, three regional records (south of Eden) were recently reported to the NPWS, in dry eucalypt forest with sparse understorey, all on rocky and infertile soils on three different rock types, Devonian sandstone, granite/adamellite and rhyolite (J Miles pers. obs. 2022).	Absent	Unlikely Not detected during surveys	No – unlikely to occur on site
Pambula Midge Orchid <i>Genoplesium rhyoliticum</i> BC Act: E EPBC Act: E	All of the documented sites where this species occurs have very shallow soil overlying rhyolite rock.	Absent	Unlikely Not detected during surveys	No – unlikely to occur on site
Thick-lipped Spider Orchid <i>Caladenia tessellata</i> BC Act: E EPBC Act: V	Associated with heathland on sandy soil, heathy or grassy woodland or open forest with a heathy or sedgy understorey on well-drained sandy or clay loam. Known from subpopulations at Morton National Park and near Braidwood. Recently (2022) discovered in Nadgee Nature Reserve and a few plants found near Ulladulla.	Absent	Unlikely Not detected during surveys	No – unlikely to occur on site
Clover Glycine <i>Glycine latrobeana</i> BC Act: CE EPBC Act: V	Associated with grassland and grassy woodland habitats, less often in dry forests, and only rarely in heathland. Threatened from grazing by native and introduced herbivores, with populations on private land probably at particular risk from high grazing pressure (Carter and Sutter 2018).	Absent High levels of grazing pressure on site	Unlikely Not detected during surveys	No – unlikely to occur on site
Chef's Cap Correa <i>Correa baeuerlenii</i> BC Act: V EPBC Act: V	Geographic limitations: known distribution north of Bega River. Associated with riparian vegetation within forests of various eucalypts, including Silvertop Ash, Yellow Stringybark, Blue-leafed Stringybark and Spotted Gum, or she-oak woodland. May also be found in near-coastal rocky sites.	Subject Land outside mapped distribution area	Unlikely Not detected during surveys	No – unlikely to occur on site
River Swamp Wallaby Grass <i>Amphibromus fluitans</i> BC Act: V EPBC Act: V	Associated with permanent swamps and wetlands which are at least moderately fertile and have some bare ground, conditions which are produced by seasonally fluctuating water levels.	Absent	Unlikely Not detected during surveys	No – unlikely to occur on site
Swamp Everlasting <i>Xerochrysum palustre</i> BC Act: Not listed EPBC Act: V	Associated with swampy habitats such as sedgy-heathy wetlands, heathlands and woodlands.	Absent	Unlikely Not detected during surveys	No – unlikely to occur on site

Species, conservation status	Ecology, distribution, description of habitat	Habitat present	Likelihood of occurrence	Potential for impact?
Flora				
Thick-leaf Starhair <i>Astrotricha crassifolia</i> BC Act: V EPBC Act: V	Associated with dry sclerophyll woodland on sandstone. Known sites near Patonga (Gosford LGA), and in Royal NP and on the Woronora Plateau (Sutherland and Campbelltown LGAs) and Glen Davis (Lithgow LGA).	Subject Land outside mapped distribution area	Unlikely Not detected during surveys	No – unlikely to occur on site
Bega Wattle <i>Acacia georgensis</i> BC Act: V EPBC Act: V	Associated with well-drained, shallow soils at sites with considerable exposed rock. Known sites at Kianinny Bay in Bournda NP, Dr George Mountain, Wadbilliga NP and in Bemboka and Coolangubra area (on cliffs above the Towamba River) of the South East Forests NP. Typically occurs on well-drained, shallow soils at sites with considerable exposed rock.	Absent	Unlikely Not detected during surveys	No – unlikely to occur on site

Species, conservation status	Ecology, distribution, description of habitat	Habitat present	Likelihood of occurrence	Potential for impact?
Mammals				
Koala <i>Phascolarctos cinereus</i> BC Act: E EPBC Act: E	Inhabits a wide range of eucalypt woodland and forest types. Known Koala use tree species occur on the Subject Land and in the adjoining forest: Forest Red Gum, Angophora Floribunda, Monkey Gum, Coastal Grey Box and Blue-leaved Stringybark. Historically common in the Bega Valley, but now very rare.	Koala use trees present as scattered paddock trees and in regrowth forest	Unlikely Surveyed for and signs of presence not detected	No – unlikely to occur on site
Long-nosed Potoroo <i>Potorous tridactylus</i> BC Act: V EPBC Act: V	Sparsely distributed along the NSW coast where it can be found in wet eucalypt forests to coastal heaths and scrubs. Associated with dense vegetation for shelter and an abundant supply of fungi for food. Forages on the ground, digging up fungi and plant material, making distinctive cup-shaped holes.	Absent Dense and wet understorey habitat absent	Unlikely Not detected in surveys	No – unlikely to occur on site
Southern Brown Bandicoot <i>Isodon obesulus</i> BC Act: E EPBC Act: E	Associated with heath or open forest with a heathy understorey on sandy or friable soils. Feeds on a variety of ground-dwelling invertebrates and fungi. Nests during the day in a shallow depression in the ground covered by leaf litter, grass or other plant material.	Absent Heathy understorey habitat absent	Unlikely Not detected in surveys	No – unlikely to occur on site
Spotted-tailed Quoll <i>Dasyurus maculatus gracilis</i> BC Act: V EPBC Act: E	Requires structurally diverse habitat such as logs with cryptic entrances, rock outcrops, windrows and burrows for use as maternal den sites, an abundance of food (birds and small mammals) and large areas of relatively intact vegetation to forage in. Large home ranges.	Absent	Unlikely	No – unlikely to occur on site
Yellow-bellied Glider <i>Petaurus australis australis</i> BC Act: V	Inhabits mature forests, preferring productive tall open sclerophyll forests with a mosaic of tree species including some that flower in winter. Large hollows within mature trees are required for shelter and breeding. On the South Coast, the tree	Breeding habitat (hollows) present but limited resource	Unlikely Not detected during surveys	No – unlikely to occur on site

Species, conservation status	Ecology, distribution, description of habitat	Habitat present	Likelihood of occurrence	Potential for impact?
Mammals				
EPBC Act: V	species utilised as sap trees are mostly eucalypts (<i>Eucalyptus</i> and <i>Corymbia</i> species). Large home ranges.	No feed/sap-trees with distinctive feeding marks identified		
Greater Glider <i>Petauroides volans</i> BC Act: E EPBC Act: E	Typically found in in taller, montane, moist eucalypt forests on fertile soils, with relatively old trees, and abundant hollows. It shelters in tree hollows and favours large hollows in large old trees.	Absent	Unlikely	No – unlikely to occur on site
Smoky Mouse <i>Pseudomys fumeus</i> BC Act: CE EPBC Act: E	Associated with heathy habitat and dense ground cover. Found a range of vegetation communities including coastal and subalpine heath, subalpine Snow Gum woodland, and dry forest dominated by eucalypts. Surveys indicate that the species' preferred habitat is ridge-top sclerophyll forest (Cockburn 1995) with a diverse understorey of heathy shrubs. Ground cover is likely to be important and can be dense low vegetation or grass tussocks, rocks and logs which provide potential shelter sites.	Absent	Unlikely	No – unlikely to occur on site
New holland Mouse <i>Pseudomys novaehollandiae</i> BC Act: Not listed EPBC Act: V	Associated with heathy habitat and dense ground cover. Found in open heathlands, open woodlands with a heathland understorey, and vegetated sand dunes.	Absent	Unlikely	No – unlikely to occur on site
Grey-headed Flying-fox <i>Pteropus poliocephalus</i> BC Act: V EPBC Act: V	Forage in a range of vegetation communities including rainforest, open forest, and closed and open woodland. Roost sites usually near water, including lakes, rivers, and coastlines.	Scattered feed trees present No camp on site	Unlikely Very limited foraging resource	No – unlikely to occur on site

Species, conservation status	Ecology, distribution, description of habitat	Habitat present	Likelihood of occurrence	Potential for impact?
Birds				
Diamond Firetail <i>Stagonopleura guttata</i> BC Act: V EPBC Act: V	Associated with grassy eucalypt-dominated woodland, feeding on native grass seeds. A potential threat is loss of native food plants as a result of invasion by exotic grasses.	Absent	Unlikely	No – unlikely to occur on site

Species, conservation status	Ecology, distribution, description of habitat	Habitat present	Likelihood of occurrence	Potential for impact?
Birds				
Gang-gang Cockatoo <i>Callocephalon fimbriatum</i> BC Act: V EPBC Act: E	In summer, generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. May occur at lower altitudes in winter, in drier more open eucalypt forests and woodlands, and often found in rural-suburban areas. Require large hollows for breeding.	No feed trees identified on the Subject Land	Unlikely	No – unlikely to occur on site
Glossy Black-Cockatoo <i>Calyptrorhynchus lathamii</i> BC Act: V EPBC Act: V	The species is uncommon although widespread throughout suitable forest and woodland habitats. Feeds almost exclusively on the seeds of several species of she-oak (<i>Casuarina</i> and <i>Allocasuarina</i>) species. Dependent on large hollow-bearing eucalypts for nest sites.	No feed trees identified on the Subject Land	Unlikely	No – unlikely to occur on site
Regent Honeyeater <i>Anthochaera Phrygia</i> BC Act: CE EPBC Act: CE	Migratory, nectar-feeding bird reliant on forest habitat and winter-flowering eucalypts. Associated with woodlands that support a significantly high abundance and species richness of bird species. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes. In NSW, the distribution is very patchy and mainly confined to the two main breeding areas in Chiltern-Albury (Victoria) and Capertee Valley (NSW) and surrounding fragmented woodlands. In some years, small flocks converge on flowering coastal woodlands and forests.	Subject Land outside mapped important areas (map accessed on 12 April 2025)	Unlikely	No – unlikely to occur on site
Swift Parrot <i>Lathamus discolor</i> BC Act: E EPBC Act: CE	Migratory, nectar-feeding bird reliant on forest habitat and winter-flowering eucalypts. Breeds in Tasmania during spring and summer, migrating in the autumn and winter months to south-eastern Australia. On the mainland they occur in areas where eucalypts are flowering profusely or where there is abundant lerp (from sap-sucking bugs) infestations. On the subject land, winter-flowering eucalypts include Forest Red Gum and Swamp Gum (<i>E ovata</i>).	Subject Land outside mapped important areas (map accessed on 12 April 2025)	Unlikely	No – unlikely to occur on site
Blue-winged Parrot <i>Neophema chrysostom</i> BC Act: V EPBC Act: V	Associated with grasslands, grassy woodlands and semi-arid chenopod shrubland with native and introduced grasses, herbs and shrubs.	Absent	Unlikely	No – unlikely to occur on site
Hooded Robin <i>Melanodryas cucullata</i> BC Act: E EPBC Act: E	Inland species associated with lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee. Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses,	Absent	Unlikely	No – unlikely to occur on site
Brown Treecreeper <i>Climacteris picumnus victoriae</i> BC Act: V	Associated with eucalypt woodlands and dry open forest predominantly of the slopes and plains inland of the Great Dividing Range. Mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open	Absent	Unlikely	No – unlikely to occur on site

Species, conservation status	Ecology, distribution, description of habitat	Habitat present	Likelihood of occurrence	Potential for impact?
Birds				
EPBC Act: V	grassy understorey and structurally diverse ground habitat with coarse woody debris.			
Pilotbird <i>Pycnoptilus floccosus</i> BC Act: V EPBC Act: Not listed	Strictly terrestrial, living on the ground in dense forests with heavy undergrowth. Largely sedentary, they are typically seen hopping briskly over the forest floor and foraging on damp ground or among leaf-litter. They are typically seen in pairs or occasionally in family parties, occupying small territories all year round.	Absent	Unlikely	No – unlikely to occur on site
Painted Honeyeater <i>Grantiella picta</i> BC Act: V EPBC Act: V	Associated with Boree/Weeping Myall, Brigalow, and Box-Gum Woodlands and Box- Ironbark Forests. Nomadic and occurs at low densities throughout its range. Sparsely distributed with the greatest concentrations of the bird and almost all breeding occurs on the inland slopes of the Great Dividing Range in NSW, Victoria and southern Queensland. Exhibits seasonal north-south movements governed principally by the fruiting of mistletoe, with which its breeding season is closely matched.	Absent	Unlikely	No – unlikely to occur on site
Grey Falcon <i>Falco hypoleucos</i> BC Act: V EPBC Act: V	Occurs at very low densities across inland semi-arid and arid Australia, including the Murray-Darling Basin, Eyre Basin, central Australia and Western Australia, where it frequents timbered lowland plains. The occasional vagrant east of the Great Dividing Range.	Absent	Unlikely	No – unlikely to occur on site
White-throated Needletail <i>Hirundapus caudacutus</i> BC Act: Not listed EPBC Act: V	Almost exclusively aerial, up to more than 1000 m above ground. Occurs over most types of habitat, however recorded most often above wooded areas, including open forest and rainforest, and may also fly below the canopy between trees or in clearings. Roosts in trees amongst dense foliage in the canopy or in hollows. Recorded in all coastal regions of QL and NSW, extending inland to the western slopes of the Great Dividing Range and occasionally onto the adjacent inland plains.	Possible (aerial)	Possible (aerial)	No – almost exclusively aerial and impacts are considered unlikely

Species, conservation status	Ecology, distribution, description of habitat	Habitat present	Likelihood of occurrence	Potential for impact
Amphibians and reptiles				
Giant Burrowing Frog <i>Heleioporus australiacus</i> BC Act: V EPBC Act: V	Occurs in areas of native vegetation and can be found in heath, woodland and open dry sclerophyll forest on a variety of soil types except those that are clay based (OEH 2022). Has not been recorded from cleared land. It burrows below the soil surface or in the leaf litter in non-breeding periods and therefore typically associated with forest or woodland vegetation with suitable ground cover habitat.	Absent	Unlikely – not detected during frog surveys	No – unlikely to occur on site
Green and Golden Bell Frog <i>Litoria aurea</i> BC Act: E EPBC Act: V	Inhabits marshes, dams and stream-sides, particularly those containing bullrushes (<i>Typha</i> spp.) or spikerushes (<i>Eleocharis</i> spp.). Optimum habitat includes water bodies that are unshaded, free of predatory fish such as Plague Minnow (<i>Gambusia holbrooki</i>), have a grassy area nearby and diurnal sheltering sites available. All the GBF records in the south-east region are from areas with sandy soils and heathy forest (pers. comm. J. Miles).	Possible	Unlikely – not detected during frog surveys	No – unlikely to occur on site
Watson's Tree Frog <i>Litoria watsoni</i> BC Act: E EPBC Act: E	Forest-dependent species, recorded from wet and dry forest, woodland, bushland, and heathland at low to high elevations. Prefers moister areas, with most records from wet forest, followed by damp forest, and warm temperate rainforest.	Absent	Unlikely – not detected during frog surveys	No – unlikely to occur on site
Stuttering Frog <i>Mixophyes balbus</i> BC Act: E EPBC Act: V	Associated with flowing creeks and streams in temperate and sub-tropical rainforest, wet sclerophyll forest and Antarctic Beech forests. Has also been recorded in dry open tableland riparian vegetation and moist gullies in dry forests.	Absent	Unlikely – not detected during frog surveys	No – unlikely to occur on site
Growling Grass Frog (Southern Bell Frog) <i>Litoria raniformis</i> BC Act: E EPBC Act: V	Breeding habitat is permanent water such as slow-flowing streams, swamps, lagoons, lakes or artificial dams for breeding. In the southern parts of the taxon's range, frogs overwinter beneath thick vegetation, logs, rocks and other ground debris, sometimes at considerable distances from waterbodies. It has disappeared from the ACT and much of its former range in NSW, where the current distribution is restricted to isolated populations around Coleambally, the Lowbidgee district and Lake Victoria, and possibly around Moulamein / Wakool.	Absent	Unlikely – not detected during surveys	No – unlikely to occur on site
Pink-tailed Legless Lizard <i>Aprasia parapulchella</i> BC Act: EPBC Act: V	Primarily an inland species known from the Central and Southern Tablelands and the South Western Slopes, with a confirmed outlier record on the Hay Plains north of Hay. Inhabits sloping, open woodland areas with predominantly native grassy ground layers, particularly those dominated by Kangaroo Grass.	Subject Land outside mapped distribution area	Unlikely	No – unlikely to occur on site

APPENDIX J SUBDIVISION CONCEPT PLAN

Figure J-1 Subdivision proposal, overall concept plan (Ocre Engineering 9 April 2025).

