Biodiversity Assessment

Planning proposal for Lot 1 DP130034 & Lot 5 DP750207, Lochiel, NSW

September 2024

Report No. 24.BA-051

Citation

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Final	12/09/2024	SS	-	Steve Sass (CEnvP)

Commercial In Confidence

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Envirokey Pty. Ltd.
PO Box 7231 Tathra NSW 2550
www.envirokey.com.au info@envirokey.com.au
ABN 35150812570

Executive Summary

EnviroKey were engaged by Annie Tyler of TA Projects on behalf of Corandrah Pty Ltd to prepare a Biodiversity Assessment (BA) for a Planning Proposal for Lot 1 DP130034 & Lot 5 DP750207, Lochiel, NSW. The study area is located within the Bega Valley local government area. The rezoning is proposed to allow the potential for a residential subdivision of the land.

The field survey identified three plant community types (PCT) within the study area. These being PCT 3181 – Bega Wet Shrub Forest, PCT 3192 - South Coast Riverflat Ribbon Gum Forest and PCT 4061 - Bega-Towamba Riparian Scrub. PCT 3181 occurs as two zones (a moderate condition zone and a poor condition zone). PCT 3192 in the study area conforms to the NSW BC Act listed threatened ecological community River-Flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions.

Field surveys did not identify any threatened flora or fauna species present, and this is not surprising given the highly degraded nature of the majority of the study area.

Overall, the study area is of little value to the biodiversity of the Lochiel area. **EnviroKey** recommend that any subdivision design should avoid the riparian area and threatened ecological community.

Shortened forms

BAM	Biodiversity Assessment Method
BAM-C	Biodiversity Assessment Method Calculator
BC Act	*Biodiversity Conservation Act 2016* (NSW)
BC Regulation	Biodiversity Conservation Regulation 2017 (NSW)
BAR	Biodiversity Assessment Report
BOAMS	Biodiversity Offsets and Agreement Management System
BOS	Biodiversity Offsets Scheme
CEEC	critically endangered ecological community
DBH	diameter at breast height over bark
EC	ecological community listed under the EPBC Act
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EEC	endangered ecological community
HTE	high threat exotic weed
IBRA	Interim Biogeographic Regionalisation for Australia
LLS Act	*Local Land Services Act 2013* (NSW)
MNES	matters of national environmental significance
NSW	New South Wales
PCT	plant community type
SAII	serious and irreversible impact
TBDC	Threatened Biodiversity Data Collection
TEC	threatened ecological community
VEC	vulnerable ecological community

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

Signature: 

Date: 12/09/2024

BAM Assessor Accreditation no: BAAS17047

ii. Details and experience of author/s and contributors

Authors and contributors

Name	BAM Assessor Accreditation no. (if relevant)	Position/Role	Tasks performed	Relevant qualifications
Steve Sass	BAAS17047	Director / Principal Ecologist	BAM-C data entry and analysis Document preparation	B.App.Sci (Env.Sci) (Hons), GradCert.CaptVertMngt (CSU) Certified Environmental Practitioner (CEnvP)
Linda Sass	-	Senior Ecologist	Internal review	Assoc.Deg. Gn.St (Science), B.A, Dip. Ed (Sec)
James Schlunke	BAAS18148	Senior Botanist	BAM/VI plots Threatened flora surveys Vegetation community survey	PhD
Zoe Sass	-	Project Officer (GIS/Ecology)	GIS mapping and analysis	B.Sc (Biology), BA
Alex Metcalfe	-	Project Officer (Ecology)	Targeted threatened fauna surveys Assist with document preparation	B.Env.Sci (On-going), Cert III Captive Animal Management

This BA was led by Mr. Steve Sass (Principal Ecologist, B.App.Sci (Env.Sci) (Hons), GradCert.CaptVertMngt (CSU)) of EnviroKey. Mr. Sass is an accredited person under the BC Act (BAAS17047). Field surveys were conducted by suitably qualified and experienced personnel.

iii. Conflict of Interest

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

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

Signature: 

Date: __12/09/2024_____

BAM Assessor Accreditation no: __BAAS17047

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Stage 1: Biodiversity Assessment

1 INTRODUCTION

1.1 BACKGROUND

EnviroKey were engaged by Annie Tyler of TA Projects on behalf of Corandrah Pty Ltd to prepare a Biodiversity Assessment Report (BA) for a Planning Proposal for Lot 1 DP130034 & Lot 5 DP750207, Lochiel, NSW. The Planning Proposal would seek the rezoning of the land, the subject of this report, to allow for potential subdivision of the land.

1.2 LOCATION

The study area is located adjacent to Mount Darragh Road, Lochiel, New South Wales. The general location of the Study Area is provided in **Figure 1-1** and **Figure 1-2**. Cadastral boundaries are identified on **Figure 1-3.**

1.3 PROPOSED ACTIVITY

While this report focusses on identifying and documenting the existing environment with regard to biodiversity, should the planning proposal be successful allowing for a rezoning, it is likely that a development application would be prepared with potential proposed activities including a residential subdivision. This BA does it assess any proposed activity. However It does describe the existing environment which could be used to prepare any environmental impact assessment should one be required.

1.4 STUDY AREA

For the purpose of this Biodiversity Assessment (BA), the study area is the land that is the subject of the rezoning proposal. The 13.11 hectare study area is also encompassed by a 1500 metre buffer that, combined with the study area forms the “assessment area”. In accordance with the BAM, a parent case (00049841) was established in the NSW Biodiversity Accredited Assessor System (BAAS) and the Biodiversity Offsets and Agreement Management System. The parent case was then split into a related case in the Biodiversity Assessment Methodology (BAM) Credit Calculator (BAM-C) (related case 00049842).

The study area is within one land use zone. This being RU2 – Rural Landscape under the Bega Valley Local Environmental Plan, 2013 (LEP). The study area has been the subject of previous disturbances due to agricultural land use. The footprint contains both native and non-native vegetation.

The study area occurs within:

- South East Corner Interim Biogeographic Regionalisation of Australia (IBRA) Bioregion
- South East Coastal Ranges Sub-region.

General photographs of the terrain and vegetation within the study area are provided in **Table 1-1**.

Table 1-1: General photos of the study area













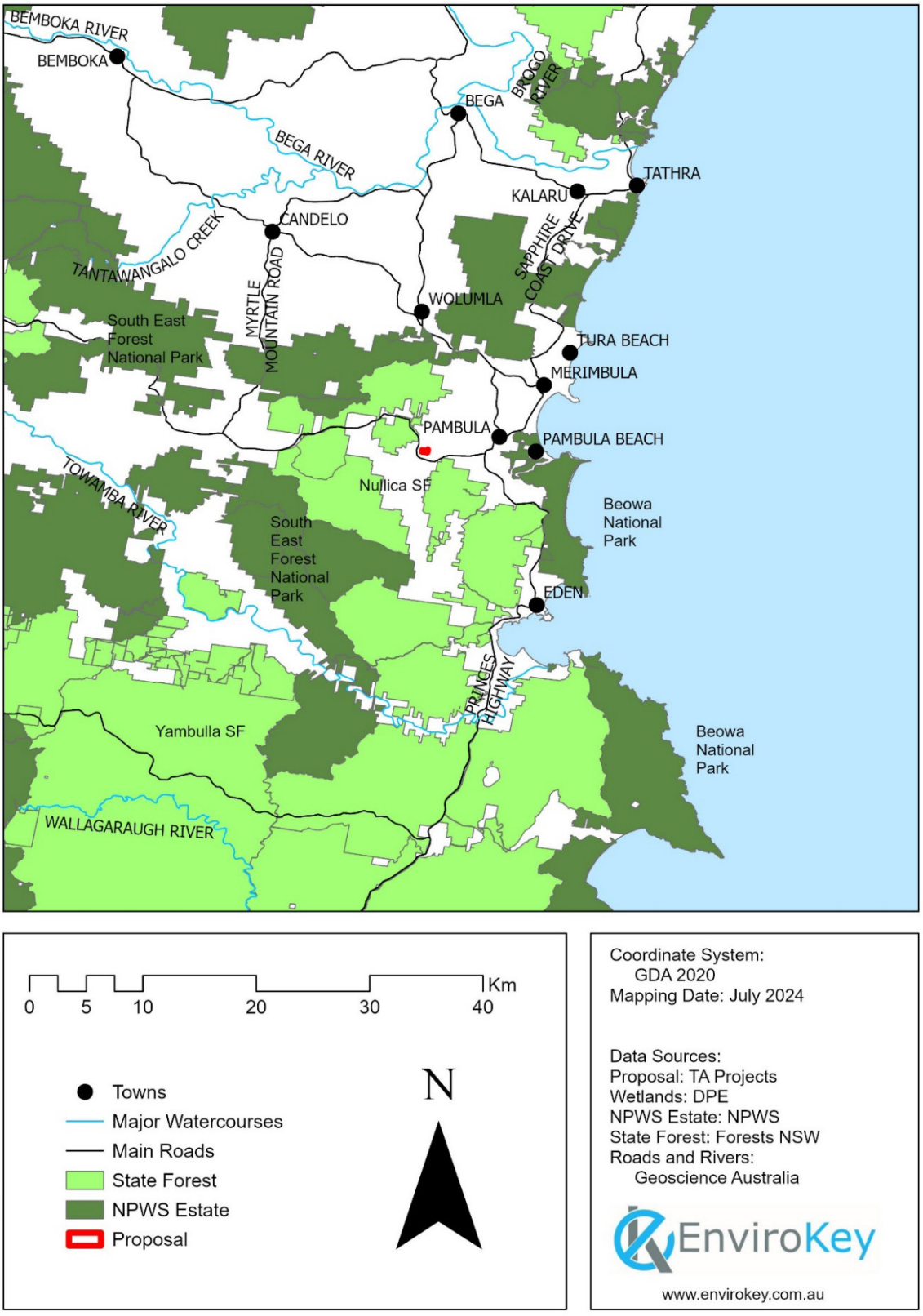
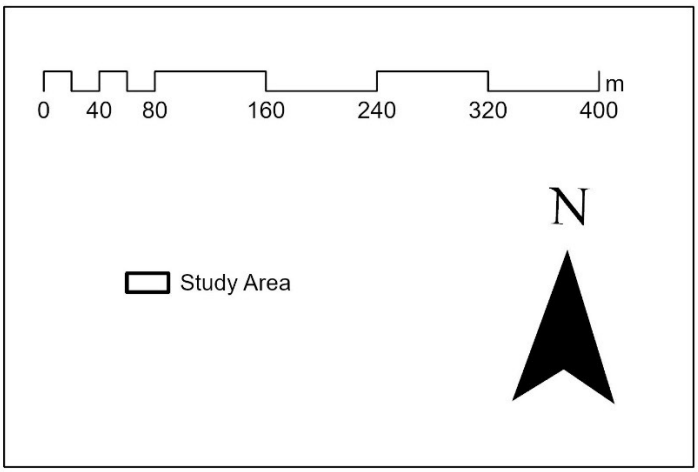


Figure 1-1: Regional location of the study area



Coordinate System:
GDA 2020, MGA Zone 55

Mapping Date: July 2024

Data Sources:
Study Area: TA Projects
Aerial Imagery: SIX Maps (NSW Govt)

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Figure 1-2: The study area

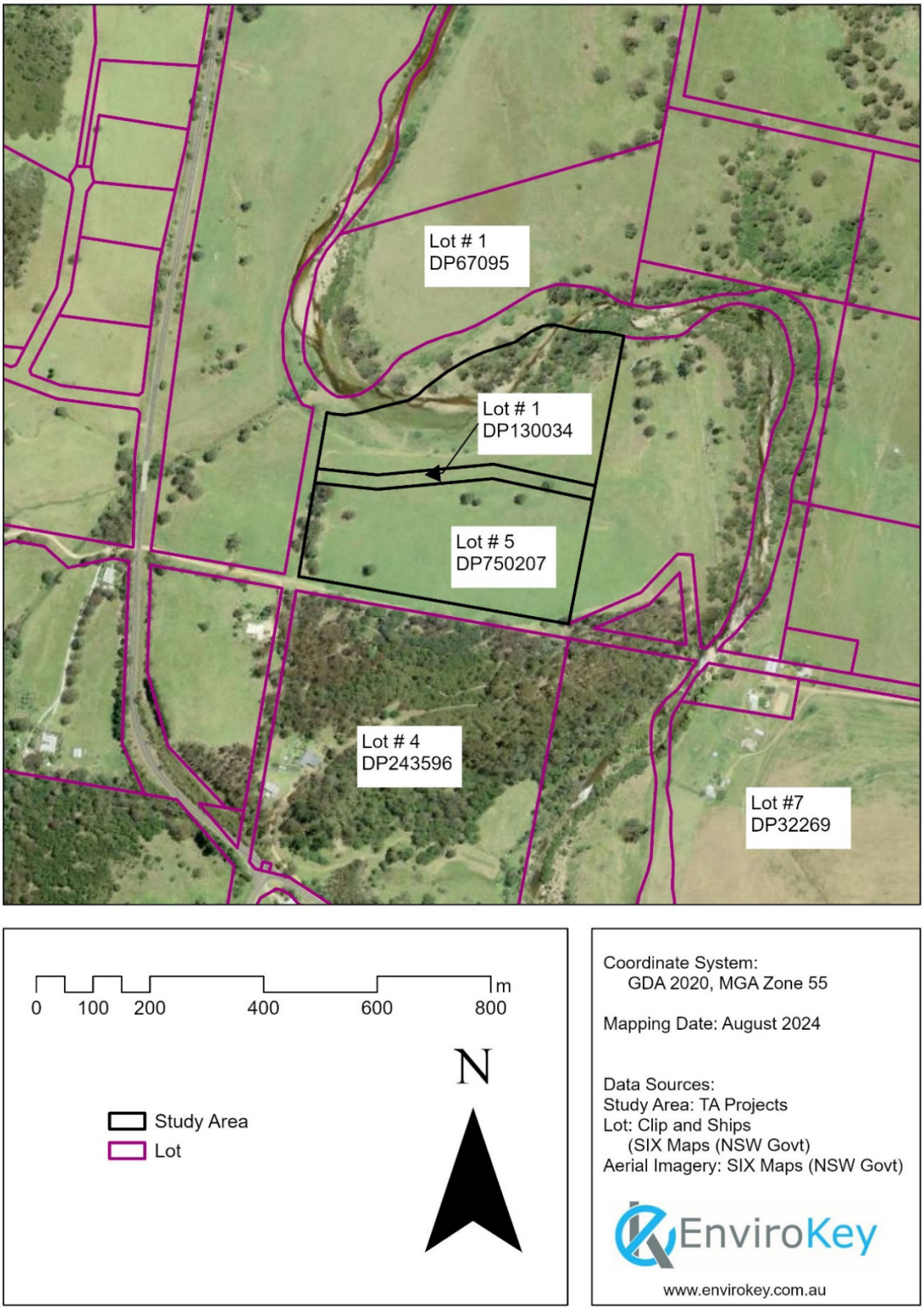


Figure 1-3: Study area showing cadastral boundaries

1.5 EXCLUDED IMPACTS

Clause 6.8(3) of the BC Act specifies that the BAM is to exclude the assessment of the impacts of any clearing of native vegetation and loss of habitat on category 1-exempt land (as defined in Part 5A of the LLS Act), other than prescribed impacts (as defined in clause 6.1 of the Biodiversity Conservation Regulation 2017 (BC Regulation)).

There is category 1 – exempt land and category 2 – regulated land mapped within the study area based on the Draft native vegetation regulatory map (accessed July 2024) (**Figure 1-4**).

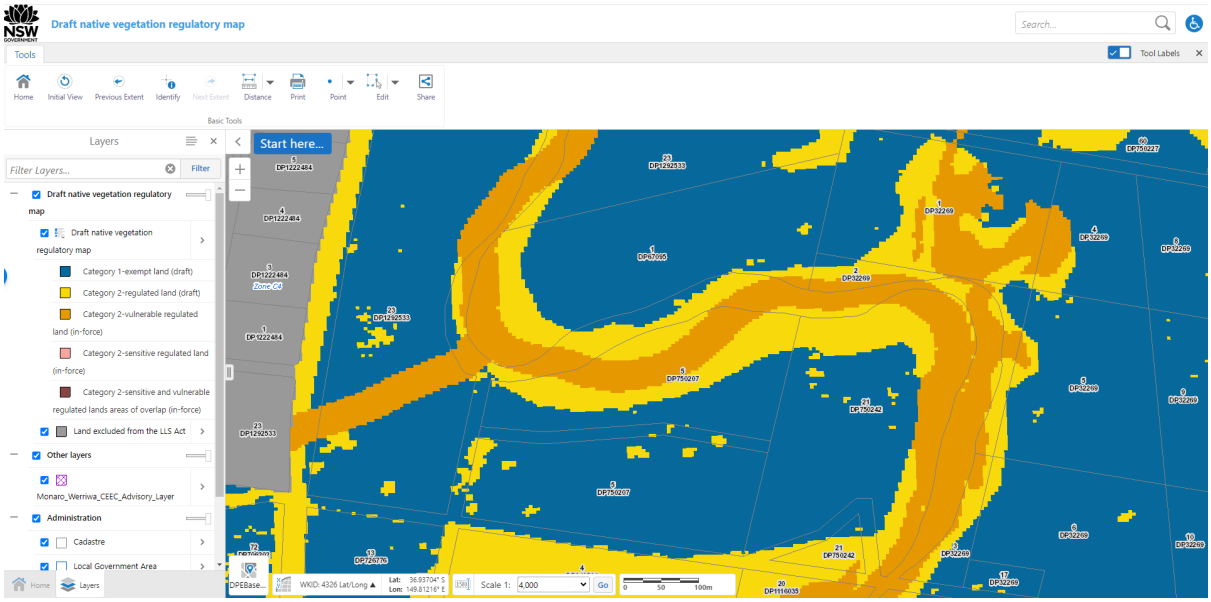


Figure 1-4: Native vegetation regulatory mapping of Lot 1 & 5

1.6 BIODIVERSITY OFFSETS SCHEME

The *Biodiversity Conservation Regulation 2017* sets out thresholds for when the Biodiversity Offset Scheme (BOS) will be triggered. The threshold has three triggers:

1. Whether the amount of native vegetation being cleared exceeds a threshold based on minimum lot size associated with the property;
2. Whether the area cleared is mapped as 'sensitive' on the Biodiversity Values Map published by the (then) NSW Office of Environment and Heritage; or
3. Whether a significant impact is likely according to a 'test of significance'.

Based on the Biodiversity Offset Scheme Entry Threshold (BOSET) Map, a small portion of the study area is mapped as having Biodiversity values (Biodiverse riparian land). This mapping relates to Pambula River that crosses a small portion of the northern end of the study area (**Figure 1-5**). This portion of the study area is however outside of the proposed

development footprint and therefore, areas mapped Biodiverse riparian land would not be impacted.

1.7 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

The EPBC Act referral is not a mandatory requirement for planning proposals. The purpose of the referral process is to determine whether or not a proposed action will need formal assessment and approval under the EPBC Act. The referral will be the principal basis for the Minister's decision as to whether approval is necessary and, if so, the type of assessment that will be taken.

More specifically, the following question must be considered:

- Is the proposed action 'likely' to have a 'significant impact' on a matter of national environmental significance?

A person or entity must not undertake an action that has, will have, or is likely to have a significant impact on any of the matters of national environmental significance (NES) or other protected matters without approval from the Australian Government Minister for the Environment and Water.

Given the poor quality of vegetation and habitats within the study area as detailed within this report, it is unlikely that any proposed action would result in a significant impact to threatened biota, including matters of NES.

1.8 INFORMATION SOURCES

The following information sources were used to guide the preparation of this BAR:

- Biodiversity Assessment Method (BAM) 2020 (DPE, 2020)
- BAM 2020 Operational Manual Stage 1
- BioNet Threatened Biodiversity Profile Data Collection (TBDC) (DPE/BCS, 2024a)
- NSW State Vegetation Map (DPE, 2024a)
- Seed database https://www.seed.nsw.gov.au/
- NSW Biodiversity Conservation Division (BCD) Threatened Biodiversity profile search
- Threatened Species Survey and Assessment: Guidelines for developments and activities (working draft) (DEC, 2004)
- Bat calls of NSW: A region based guide to echolocation calls of microchiropteran bats (Pennay et al., 2004).

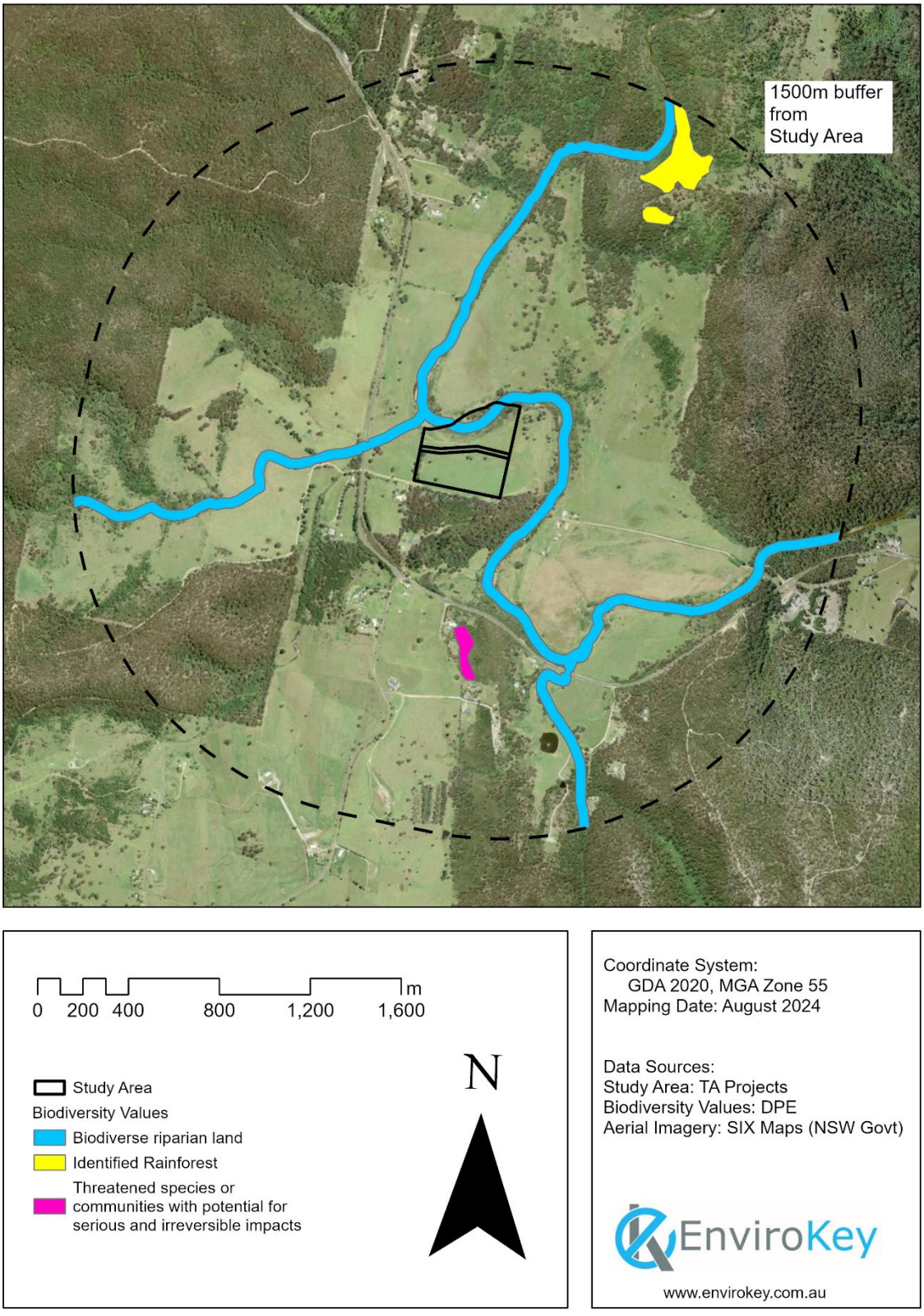


Figure 1-5: Biodiversity Values mapping within the study area and surrounds

2 METHODS

2.1 SITE CONTEXT METHODS

2.1.1 Landscape features

In accordance with the BAM, a number of features are assessed within and surrounding the study area which was conducted within ArcGIS and implemented within the BAM-C. Landscape value is an assessment of a number of factors including:

- Native vegetation cover
- Rivers, streams and estuaries
- Areas of geological significance
- Karst areas
- Areas of outstanding biodiversity value
- Habitat connectivity.

2.1.2 Native Vegetation Cover

A layer of native vegetation cover within a buffer of 1500 metres around the study area was used to determine the context of the study area. The Sharing and Enabling Environmental Data (SEED) database was searched for relevant vegetation information to determine the extent of native vegetation within the buffer. Data from the NSW State Vegetation Type Map was used to determine native vegetation cover within the buffer.

2.2 VEGETATION COMMUNITY METHODS

2.2.1 Existing information

A review of relevant databases and existing vegetation mapping was carried out to identify likely vegetation communities and threatened ecological communities with the potential to occur within the vicinity of the study area. This information was reviewed prior to field surveys commencing.

The following resources were used:

- Database searches
    - Protected Matters Search Tool (EPBC Act) for flora and ecological communities identifies as Matters of National Environmental Significance (MNES) known from or with potential habitat (Last Accessed 15/07/2024).
    - BAM-C tool to identify potential candidate species credit species and predicted ecosystem species known or predicted to occur within the IBRA subregion (Last Accessed 28/08/2024).

- Vegetation mapping
    - State Vegetation Type Mapping (SVTM) was examined prior to the field surveys commencing to understand the plant community types with the potential to occur within the study area (DPE, 2024a).

2.2.2 Mapping native vegetation

Vegetation within the study area was recorded and mapped using a combination of a vegetation quadrats and a walking meander.

2.2.3 Vegetation integrity survey

Nine vegetation integrity (VI) plots, as defined by the BAM, were carried out (at least one within each vegetation zone).

Assessment of vegetation mapping, verification of vegetation communities and the presence of threatened ecological communities, was completed from a combination of floristic surveys in accordance with the BAM. Plant community types (PCT) were assigned to published PCTs in accordance with the SVTM. The PCT assignment was done by comparing the dominant species recorded, the general description of location including landscape position, soil type and other attributes as described in the OEH online VIS classification database v2.1 (DPE, 2024b).

The location of the VI plots for the study area is provided in **Figure 2-1**.

2.3 THREATENED FLORA AND FAUNA SURVEY METHODS

2.3.1 Review of existing information

A review of relevant literature and databases was carried out to identify likely vegetation communities and threatened biota with the potential to occur within the vicinity of the study area. This information was reviewed prior to field surveys commencing.

Database searches within the locality (10 km of the study area) were conducted prior to the commencement of the field survey. The following resources were used:

- Database searches
    - NSW BioNET Atlas for spatial records of threatened flora and fauna listed under the BC Act and EPBC Act (DPE/BCS, 2024a) (Last Accessed 24/07/2024).
    - Protected Matters Search Tool (EPBC Act) for flora and ecological communities identified as Matters of National Environmental Significance (MNES) known from or with potential habitat (Last Accessed 15/07/2024).

  - BAM-C tool to identify potential candidate species credit species and predicted ecosystem species known or predicted to occur within the IBRA subregion (Accessed 8/08/2024).

- Vegetation mapping
  - State Vegetation Type Map was examined prior to the field surveys commencing to understand the plant community types with the potential to occur within the study area.

Threatened species that require assessment were initially identified based on a specific set of criteria. These being:

- The distribution of the species includes the IBRA subregion of the study area
- The study area has geographic constraints of the species distribution within the IBRA subregion
- The species is associated with the PCTs of the study area
- Native vegetation cover within a 1500 metre buffer of the study area exceeds the minimum habitat required for the species
- Patch size exceeds the minimum required for the species
- The species is identified as an ecosystem or species credit species in the Threatened Biodiversity Data Collection.

Ecosystem Credit Species are defined by BAM as species for which the likelihood of occurrence or the presence of potential habitat can be predicted based on vegetation proxies and landscape features, or species for which targeted surveys have a low probability of detection (DPE, 2020). Species Credit Species are defined by BAM as species for which the likelihood of occurrence or the presence of potential habitat cannot be predicted based on vegetation proxies or landscape features and which can be reliably detected by targeted surveys.

The process for identifying threatened species which meet the criteria is determined by the BAM-C. The PCT identified within the study area, patch size and native vegetation cover (as detailed within section 4 of this BAR) were entered into the BAM-C. This resulted in a preliminary list of threatened species.

2.3.2 Flora surveys

Nine vegetation integrity plots were completed within the study area on the 22nd and 23rd of July 2024. Plots were undertaken within each vegetation zone where the level of survey effort met the minimum number of plots per zone. Each plot measured the composition, structure and functions attributes of the vegetation present. Additionally, threatened flora transects were carried out across the study area. However, these were limited given the very low condition of the vegetation present.

2.3.3 Fauna surveys

The BAM details the process for determining the habitat suitability for threatened species (section 6 of BAM). Under the BAM, threatened species are separated into two categories; 'ecosystem' and 'species' credit species. Those threatened species where the likelihood of occurrence of a species or components of the species' habitat can be predicted by vegetation surrogates and landscape features, or for which a targeted survey has a low probability of detection, are identified as 'ecosystem' credit species. Targeted surveys are not required for ecosystem species and potential impacts to these species are assessed in conjunction with impacts to each PCT.

Field survey methods to carry out the field assessment of the terrestrial biodiversity values of the study area were completed on the 22nd July 2024.

The surveys considered the relevant survey guidelines for general impact assessment and for specific threatened species. If information was not available on whether or not threatened species occur within the study area, then a precautionary approach was adopted, and species presence was assumed. This approach is consistent with the BAM and relevant impact assessment guidelines.

Field surveys were conducted under the authority of a current Scientific License issued under Clause 22 of the *National Parks and Wildlife Regulation 2002* and section 132C of the *National Parks and Wildlife Act 1974* by OEH and an Animal Research Authority approved by, and in accordance with, the Animal Care and Ethics Committee (ACEC) of the Director-General of Department of Primary Industries.

The locations of all field surveys are provided on **Figure 2-1**.

Fauna survey effort was focused on the basis of vegetation communities and potential habitat for threatened fauna within the study area. The following provides a summary of the methodology applied to this BAR.

Diurnal bird surveys

Surveys to determine the presence and usage of the study area by diurnal birds were conducted. Five surveys were completed within the study area (**Figure 2-1**), guided by a standardised technique (Watson, 2003). Surveys were conducted in either the early morning or late afternoon to coincide with peak bird activity. The observer actively searched for diurnal birds and identified species by sight and by vocalisation during each 20-minute bird survey.

Nocturnal surveys – Call Playback

Call playback was conducted to target nocturnal fauna. The target species for this assessment were the Yellow-bellied Glider, Barking Owl, Masked Owl and Powerful Owl. Call playback was undertaken within the study area during the field survey. One survey was conducted over one night for this assessment (**Figure 2-1**).

At the location, the call playback survey commenced with an initial listening period of three minutes. The call of the target species was then transmitted intermittently over a period of two

minutes, followed by a three-minute listening period. The call playback session was 30 minutes.

Spotlighting was undertaken at the conclusion of the call playback as described below.

Nocturnal surveys – Spotlighting and Echolocation Call Recording Survey

Spotlighting was undertaken using a hand-held 50W spotlight by one person at the conclusion of each call playback (nocturnal) survey for a period of one person hour.

While spotlighting, microchiropteran bats were targeted by using a 'Titley' Anabat Walkabout Echolocation Call Recording Unit. Survey time was about 60 minutes. The use of Echolocation Call Recording Unit is consistent with state and commonwealth guidelines for surveying microchiropteran bats.

All data collected from the Anabat was then analysed into bat and non-bat origin files. These files were then analysed guided by the 'Bat Calls of New South Wales: Region based guide to echolocation calls of microchiropteran bats' (Pennay et al., 2004) and the EnviroKey reference call collection. It should be noted that members of the *Nyctophilus* genus were unable to be identified to species level due to a lack of differentiation between species and are identified to genus level only. Anabat analysis was conducted by Principal Ecologist Steve Sass, who has analysed more than 50,000 files from across southern NSW.

A call was defined as a sequence of three or more consecutive pulses of similar frequency. Due to variability in the quality of calls and the difficulty in distinguishing some species, the identification of each call was assigned a confidence rating as follows:

> D = Definite: Species identification not in doubt.
>
> PR = Probable: Call most likely to represent a particular species, but there exists a low probability of confusion with species of similar call types.
>
> PO = Possible: Call characteristics are comparable with the species, but there exists a reasonable probability of confusion with one or more bat similar species, or the quality or length of call prohibits a confident identification.

Those calls unable to be identified due to poor call quality resulting in a lack of diagnostic features were assigned 'Unidentifiable'.

Camera trapping

One Reconyx remote sensing camera was installed and activated within the study for a total of 10 days (**Figure 2-1**). This camera captures any animal movement within 18 metres of the camera during diurnal and nocturnal hours. The camera takes up to two frames per second in colour by day and black and white by night.

Baits were set up near the front of the camera to attract any threatened mammals that may be within or near the study area. A bait ball mix of peanut butter, oats and honey and a separate truffle oil bait was used as the attractants.

All data captured on the camera was then analysed with a particular focus on any photographs of threatened mammals.

2.4 WEATHER CONDITIONS

Weather conditions were considered conducive to detecting all fauna species, including threatened fauna across a range of seasonal and yearly surveys. Data from the closest weather station was sought (BOM, 2024) (Merimbula) and is presented (**Table 2-1**).

Table 2-1: Weather conditions during field survey periods

Date	Min Temp (degrees C)	Max Temp (degrees C)	Rainfall (mm)
22/07/2024	5.7	19.8	0.0
23/07/2024	6.9	20.1	0.0

2.5 LIMITATIONS

Field surveys were guided by the BAM (DPE, 2020) and the Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities (working draft) (DEC, 2004) with consideration of the size of the study area and the plant community types and fauna habitats present. The survey methods used in this study confirms that this assessment is consistent with biodiversity guidelines.

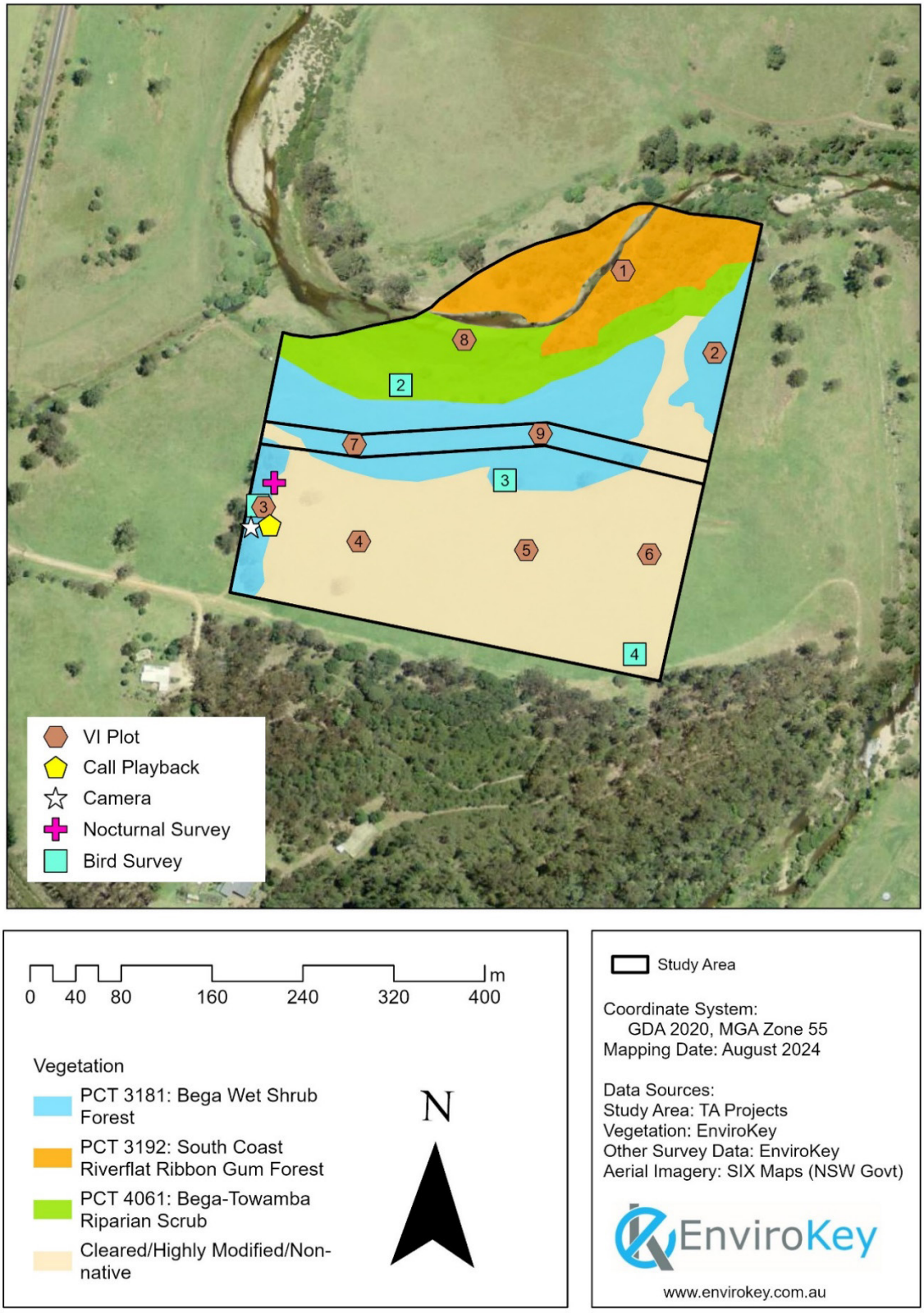


Figure 2-1: VI plot and fauna survey locations within the study area

3 LANDSCAPE CONTEXT

3.1 IDENTIFY LANDSCAPE FEATURES

In accordance with the BAM, a number of features are assessed within and surrounding the study area. This section provides details relating to the IBRA region and subregion and NSW landscape region (Mitchell Landscapes). Other landscape features such as rivers, streams, estuaries and wetlands, habitat connectivity, karst areas or areas of outstanding biodiversity value are considered where appropriate.

Landscape features are detailed in **Figure 3-1** to **Figure 3-8.** Landscape features were identified by desktop image analysis, SEED map layers and site walkovers. A discussion of relevant landscape features is provided below.

3.1.1 IBRA bioregions and IBRA subregions

IBRA bioregions represent a landscape-based approach to the classification of land including geomorphology, landform, climate, lithology and characteristic flora and fauna (Thackway & Creswell, 1995). The study area is located entirely within the South East Corner IBRA bioregion and the South East Coastal Ranges IBRA subregion (NPWS, 2003). IBRA regions and subregions are detailed in **Figure 3-1.**

3.1.2 NSW (Mitchell) landscape

One Mitchell landscape is mapped within the study area (**Figure 3-2**). Bodalla – Nadgee Coastal Sands landscape is characterised by beach, dune and lagoon complex of Quaternary quartz sands. General elevation 0 to 20m. Moderate carbonate content in frontal dune transitions to simple podsols with organic pan and diffuse iron pans on the most inland dunes. Organic silty sand in lagoons and estuary (Mitchell, 2002).

3.1.3 Rivers, streams, estuaries and wetlands

There is one river crossing the northern portion of the study area, this being Pambula River (**Figure 3-3**). There are no streams, estuaries or wetlands within or adjacent to the study area. Pambula river is mapped as Key Fish Habitat by the NSW Department of Primary Industries (Fisheries) (**Figure 3-4**). The portion of Pambula River crossing the study area is mapped as having a 'fair' Freshwater Fish Community Status (**Figure 3-4**). Additionally, one Threatened Fish Habitat occurs within the portion of river crossing the study area, this being Australian Grayling (**Figure 3-5**).

No important local wetlands, national wetlands (i.e. as listed in The Directory of Important Wetlands of Australia or international wetlands (e.g. Ramsar listed)) are located within the study area.

3.1.4 Habitat connectivity

The study area is located within a highly modified landscape (i.e. agricultural land), consisting of exotic grassland and scattered trees. Pambula River crosses the northern portion of the study area, which would provide habitat connectivity upstream and downstream of the river. In the wider landscape, the river connects to larger areas of habitat in the form of Yurammie State Forest, providing connectivity opportunities given the extent of mapped vegetation (**Figure 3-6**).

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

There are no geological features of significance within the study area. Additionally, no specific soil hazards such as acid sulfate soils, have been identified within the study area.

3.1.6 Areas of outstanding biodiversity value

There are no areas of outstanding biodiversity value, as identified under the BC Act, within the study area or within the Bega Valley local government area.

3.2 NATIVE VEGETATION COVER

A layer of native vegetation cover is required for a 1500 metre buffer around the study area to determine the context of the site within the assessment area. The extent of native vegetation within the assessment area was considered using the SVTM as the vegetation layer.

Table 3-1 summarises the extent of native vegetation cover within the 1500 metre buffer, while **Figure 3-7** shows the native vegetation extent and **Figure 3-8** shows native vegetation extent using the SVTM using an air photo.

Table 3-1: Native vegetation cover in the assessment area (1500 metre buffer of study area)

Study area (ha)	4.15
Total area of native vegetation cover (ha)	560.52
Percentage of native vegetation cover (%)	0.74%
Class (0-10, >10-30, >30-70 or >70%)	0-10%

3.3 PATCH SIZE

Patch size as defined by the BAM as '*an area of native vegetation that:*

- *Occurs on the development site or biodiversity stewardship site, and*
- *Includes native vegetation that has a gap of less than 100 metres from the next area of moderate to good condition native vegetation (or <30 metres for non-woody*

ecosystems). Patch size can extend onto adjoining land that is not part of the development site or biodiversity stewardship site'.

Patch size was calculated using the field validated vegetation types and consideration of the SVTM. Patch size is required to be assessed as one of four classes per vegetation zone mapped. These being <5 hectares, 5-24 hectares, 25-100 hectares or >100 hectares.

Based upon vegetation mapping and air photo interpretation beyond the study area, patches were assigned to the <5 hectares class and 5-24 hectares class which was applied to the BAM-C.

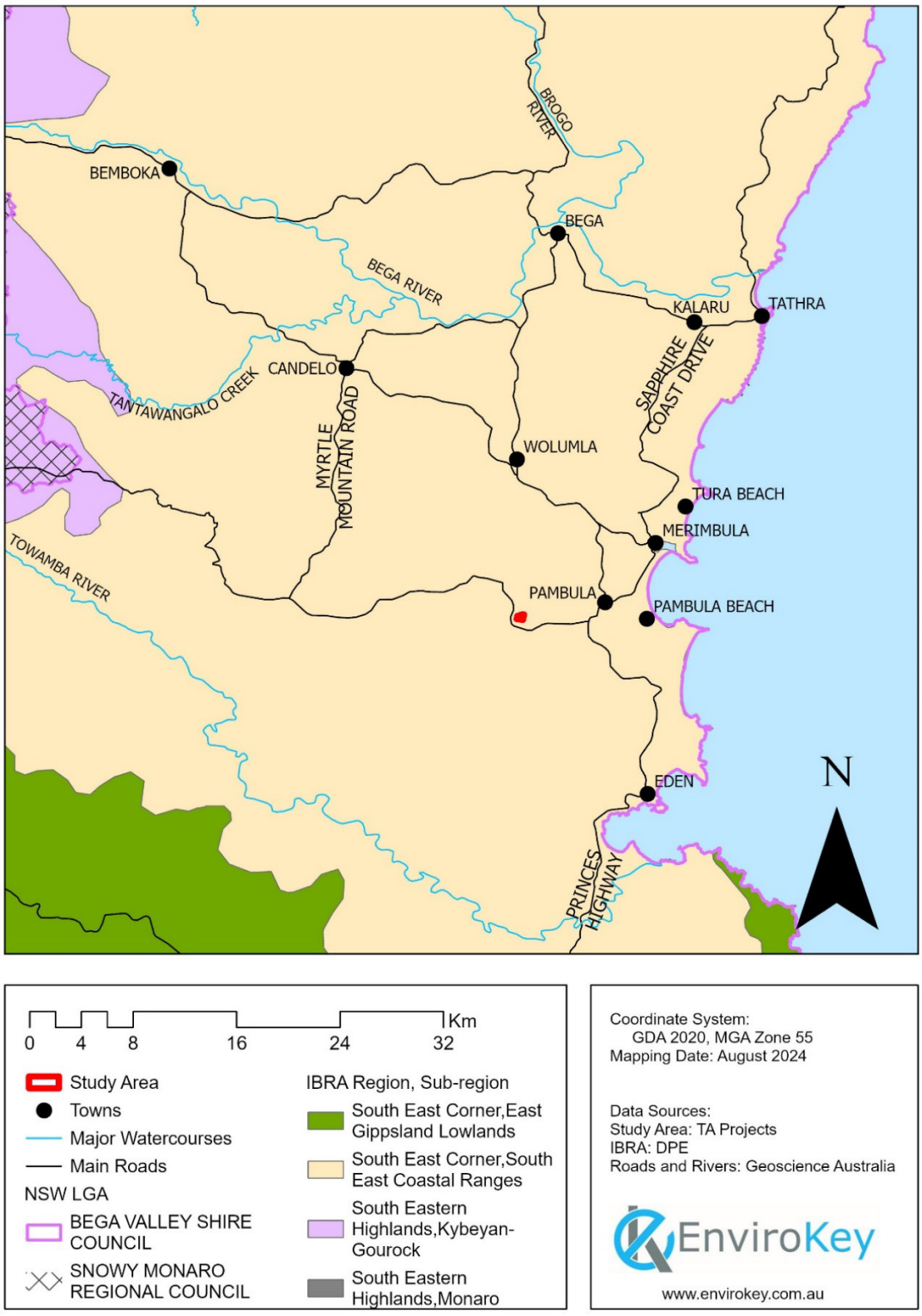


Figure 3-1: Location Map with NSW LGA Boundaries and IBRA regions/subregions for the study area

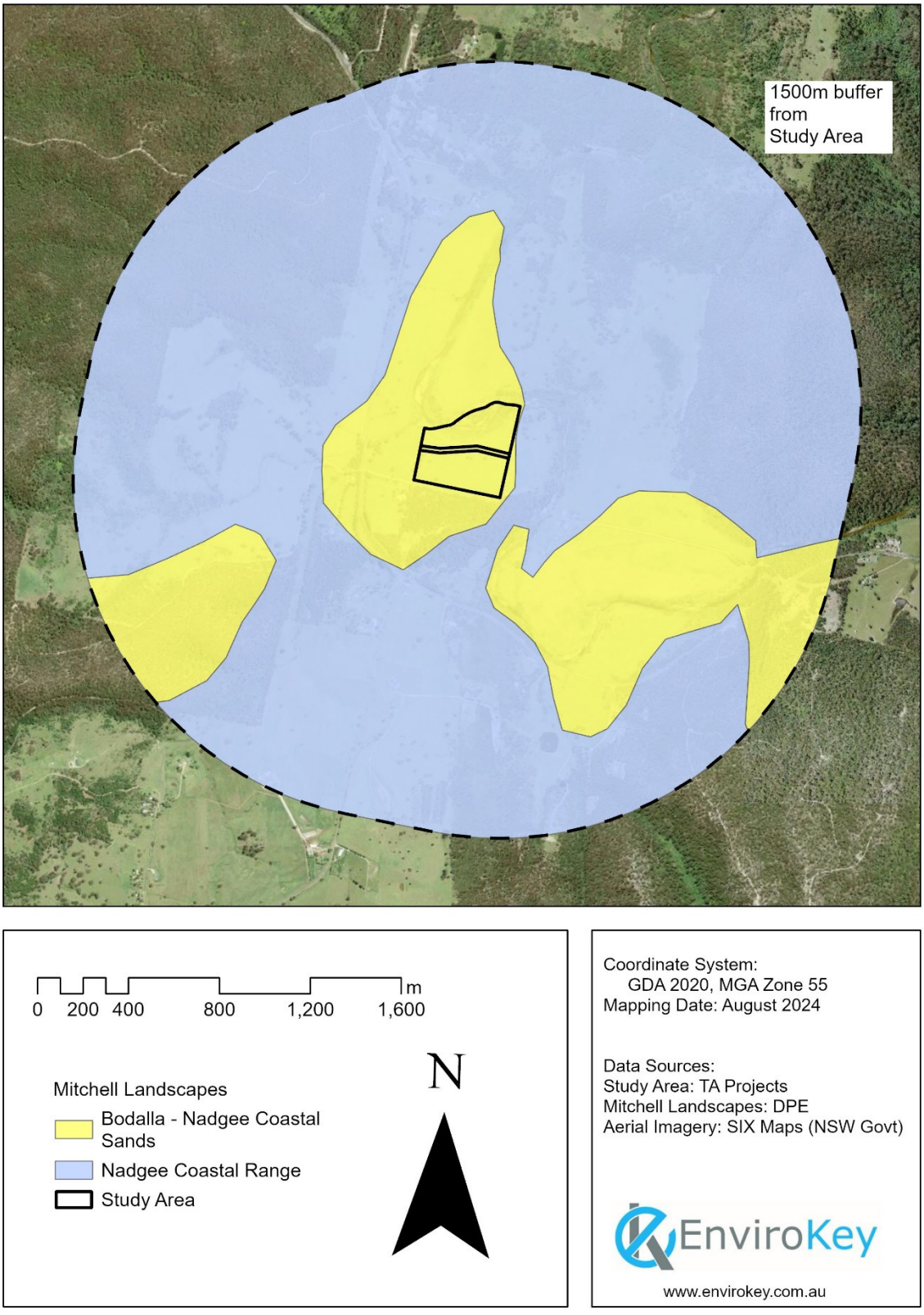


Figure 3-2: Mitchell landscapes within the study area

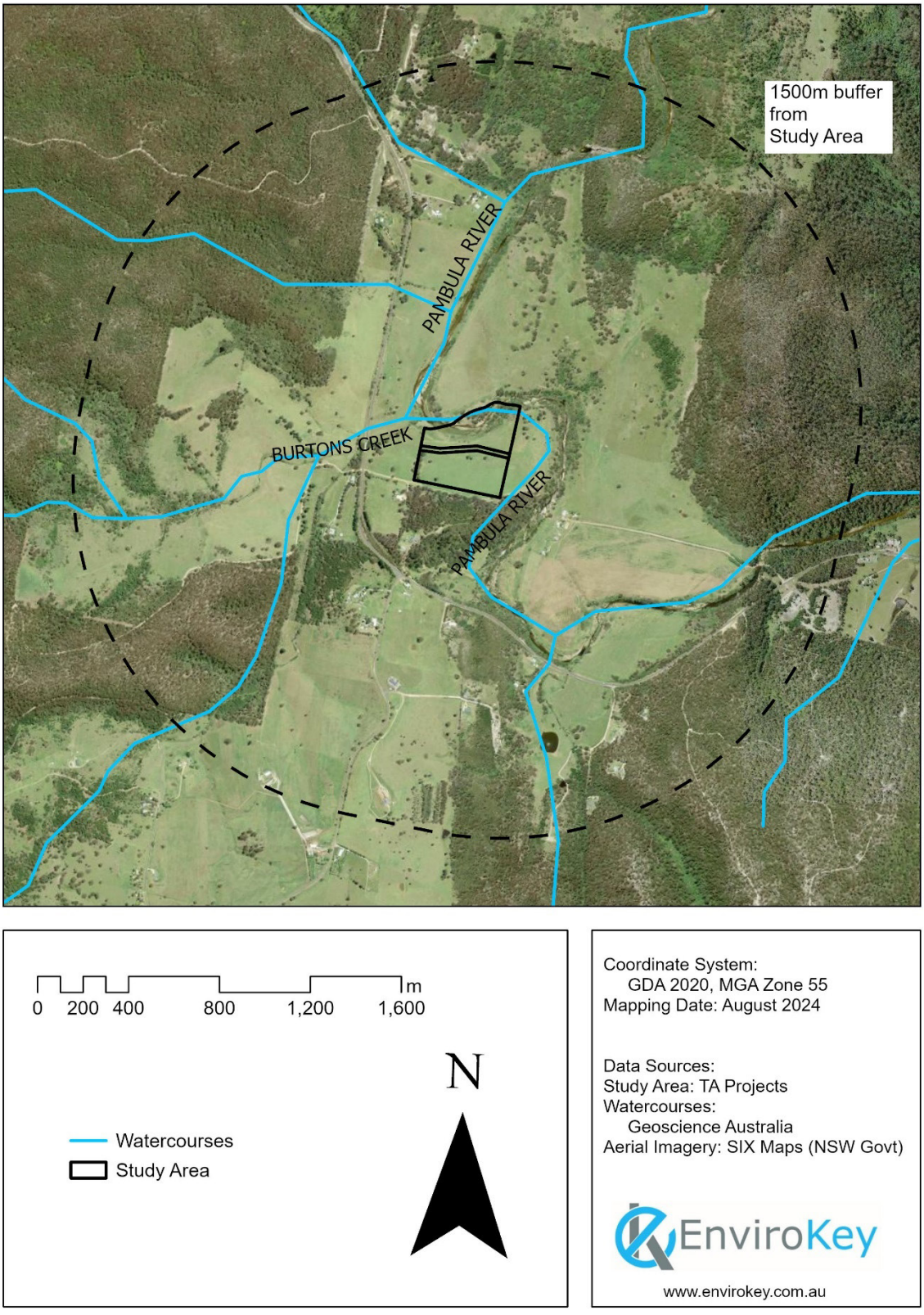


Figure 3-3: Waterways within the study area

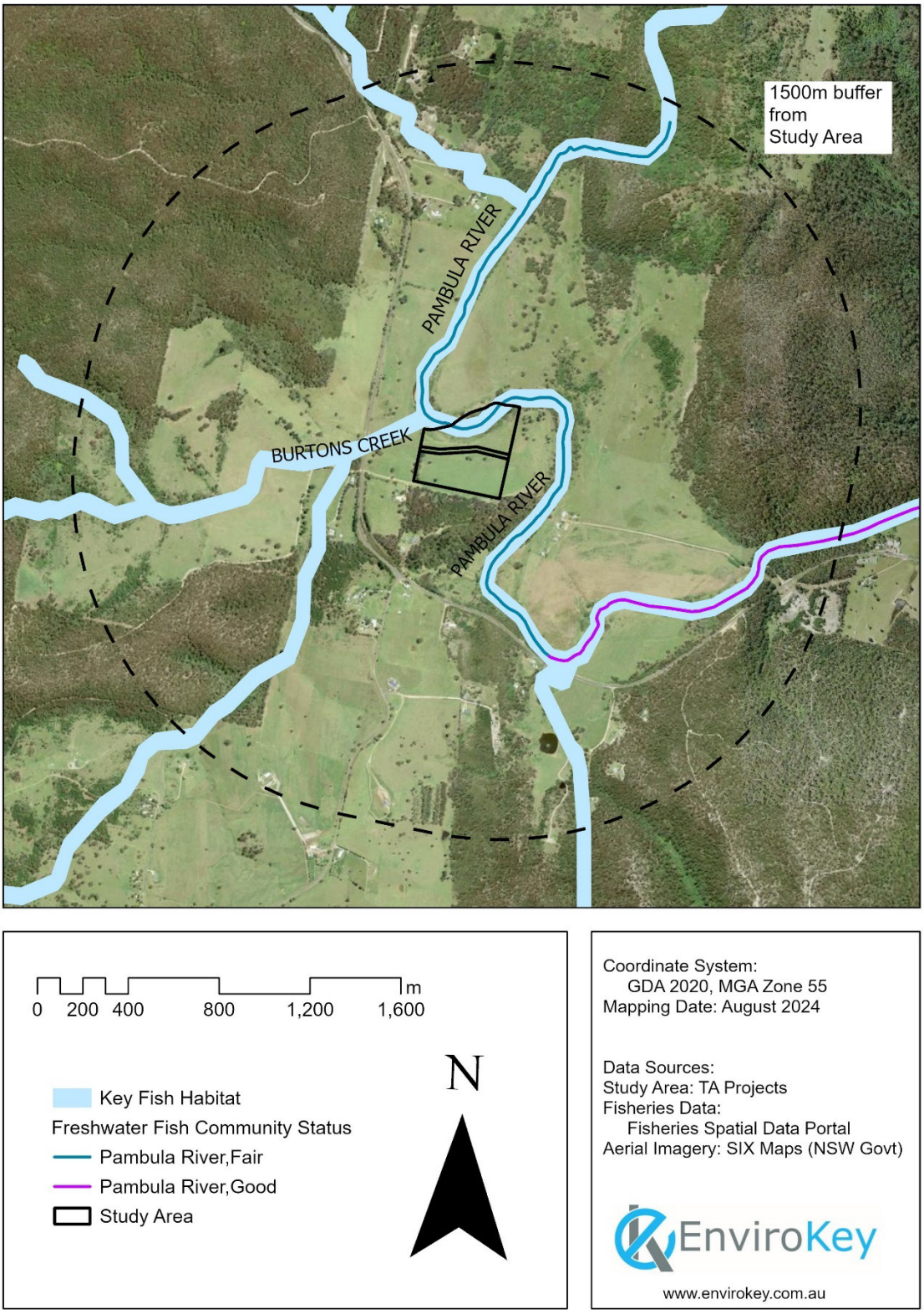


Figure 3-4: Key Fish Habitat and Freshwater Fish Community Status within a 1500-metre buffer of the study area

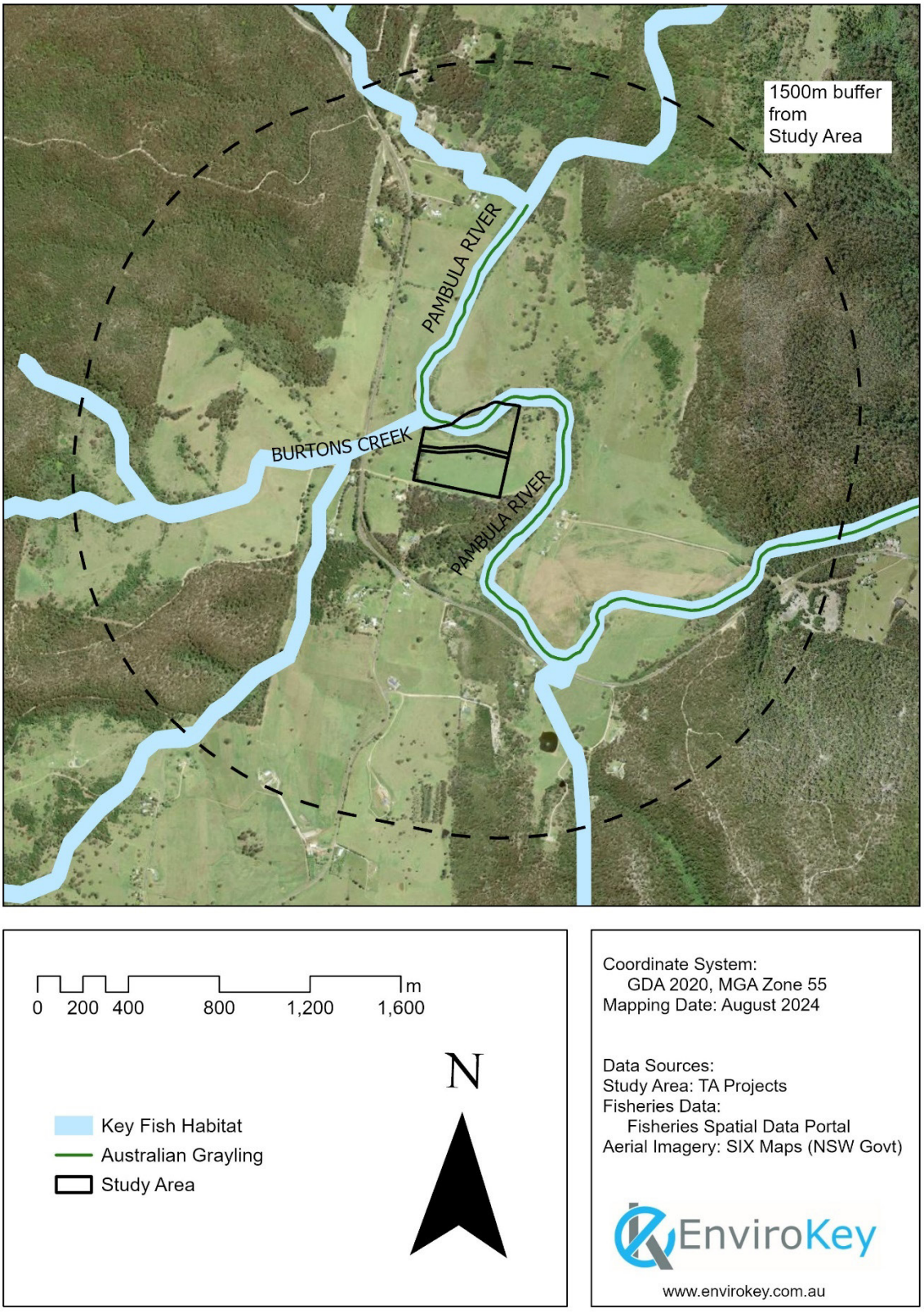


Figure 3-5: Fish Freshwater Threatened Species within a 1500-metre buffer of the study area

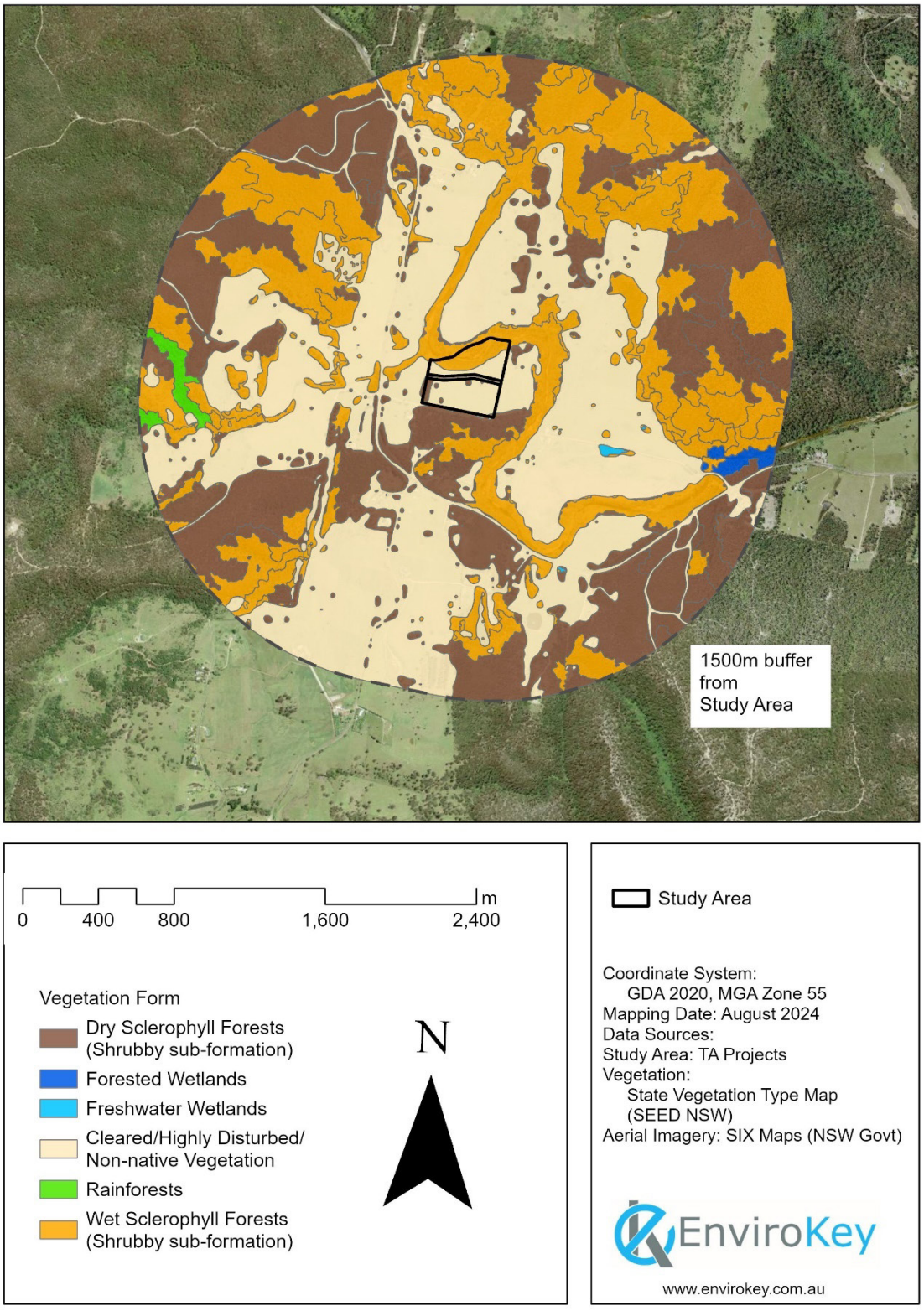


Figure 3-6: Vegetation formation highlighting habitat connectivity within a 1500-metre buffer of the study area

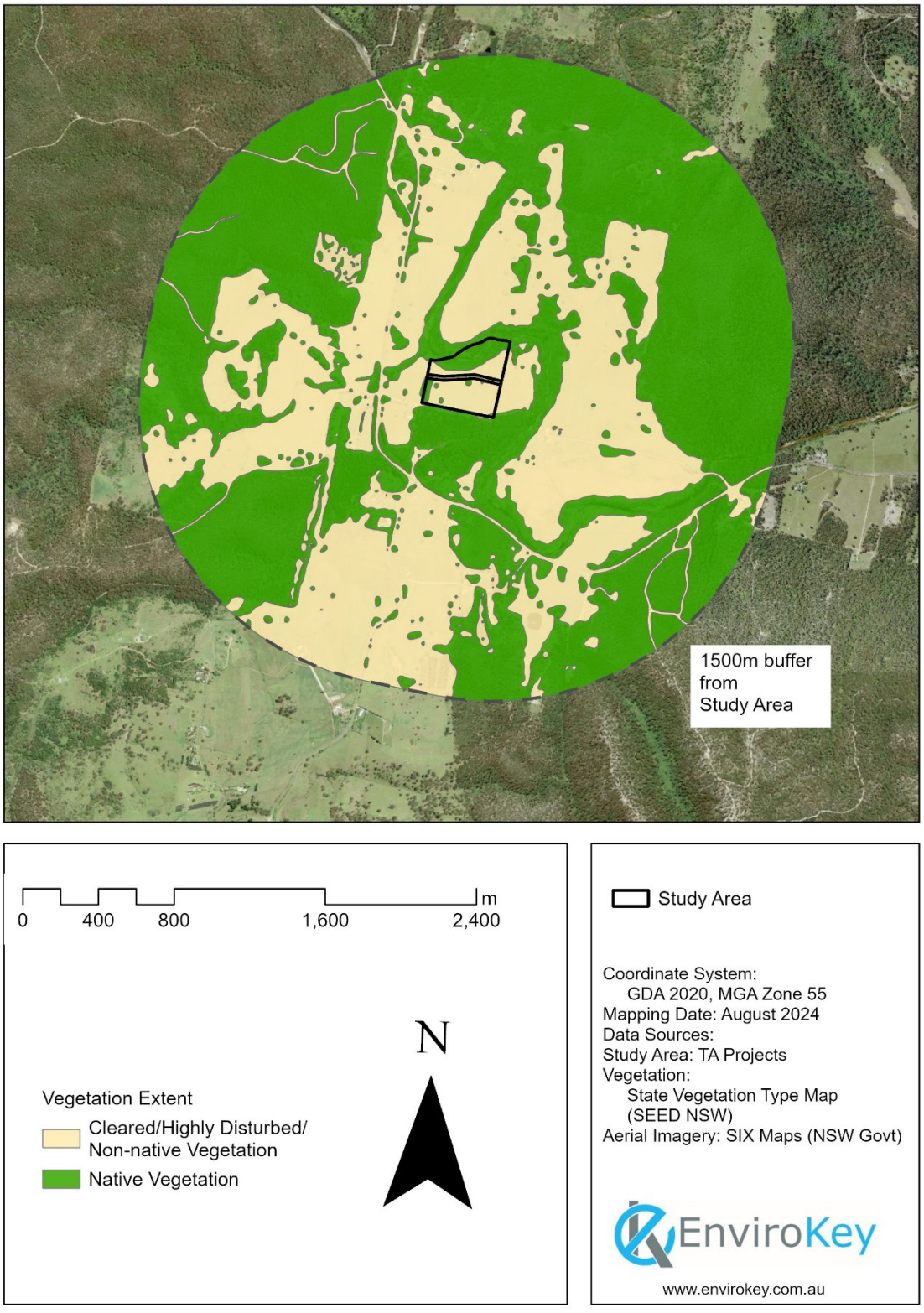
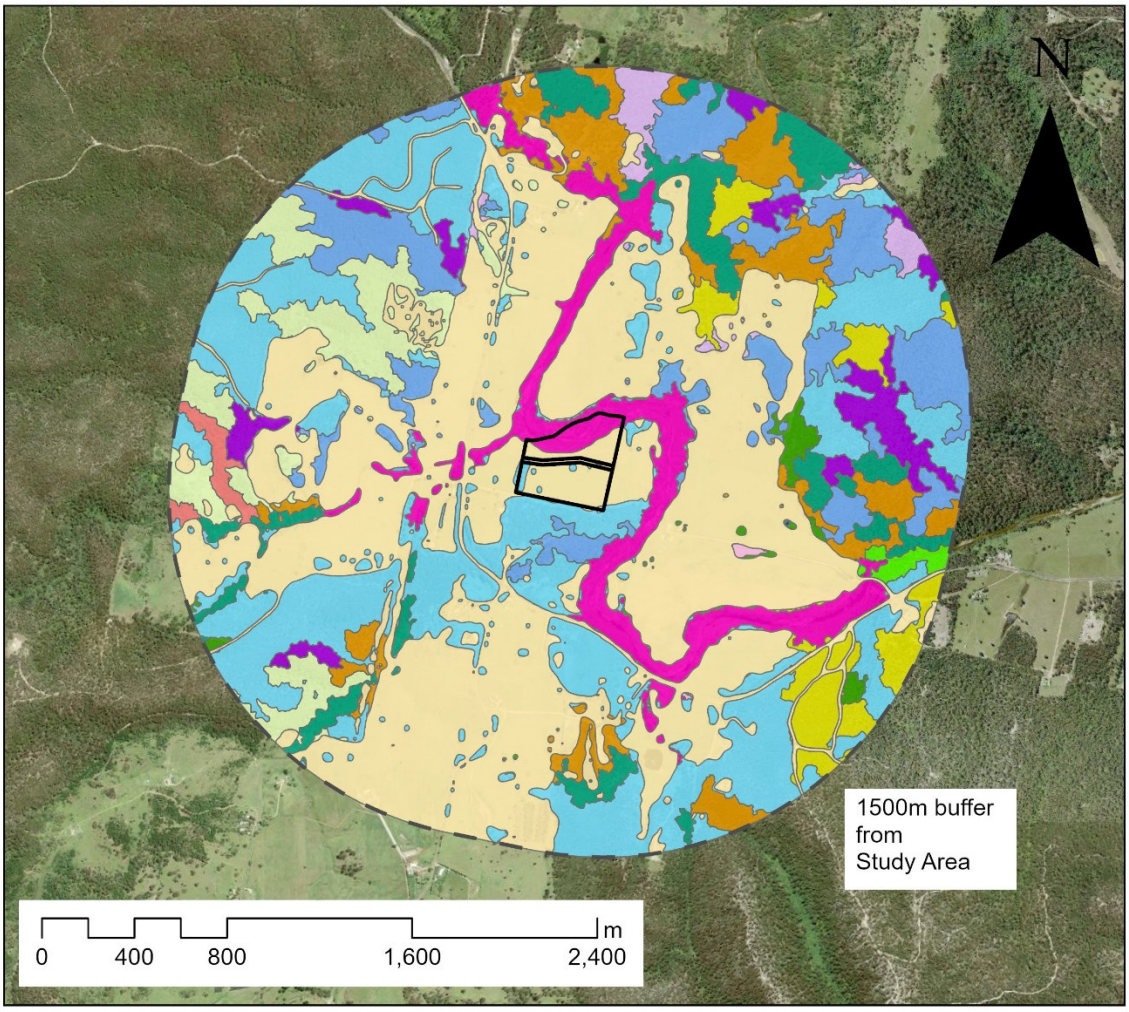


Figure 3-7: The study area showing the 1500-metre buffer using an air photo to show native vegetation extent



Vegetation

- Cleared/Highly Disturbed/ Non-native Vegetation
- PCT : 3108 South Coast Scarp Wet Vine Forest
- PCT : 3181 Bega Wet Shrub Forest
- PCT : 3185 Far South Riverflat Wet Forest
- PCT : 3189 South Coast Gully Shrub Forest
- PCT : 3193 South Coast Stringybark-Monkey Gum Wet Forest
- PCT : 3196 Southeast Hinterland Intermediate Shrub Forest
- PCT : 3659 South Coast Hinterland Silvertop Ash Forest
- PCT : 3660 South Coast Hinterland Yellow Stringybark Forest
- PCT : 3662 South Coast Lowland Blackbutt Forest
- PCT : 3663 Southeast Foothills Stringybark Shrub Forest
- PCT : 3962 Coastal Floodplain Phragmites Reedland
- PCT : 3975 Southern Lower Floodplain Freshwater Wetland
- PCT : 4026 Estuarine Sea Rush Swamp Oak Forest
- PCT : 4112 Southeast Dry Rainforest

Study Area

Coordinate System:
GDA 2020, MGA Zone 55
Mapping Date: August 2024
Data Sources:
Study Area: TA Projects
Vegetation:
State Vegetation Type Map (SEED NSW)
Aerial Imagery: SIX Maps (NSW Govt)

EnviroKey
www.envirokey.com.au

Figure 3-8: NSW State Vegetation Type mapping within a 1500-metre buffer of the study area

4 NATIVE VEGETATION, THREATENED ECOLOGICAL COMMUNITIES, FAUNA AND VEGETATION INTEGRITY

4.1 NATIVE VEGETATION EXTENT

A review of the NSW State Vegetation Map confirms the presence of native vegetation within the assessment area. Two PCTs are mapped within the study area (**Figure 3-8**). Based on the SVTM, the two PCTs and their extent within the study area are detailed in **Table 4-1**.

Table 4-1: The extent of the Plant Community Type within the Study Area based on the NSW State Vegetation Type Map

PCT Name	Area (ha)	% of the study area
Non-native vegetation	3.87	51.53
PCT 3185 – Far South Riverflat Wet Forest	3.44	45.81
PCT 3659 – South Coast Hinterland Silvertop Ash Forest	0.2	2.66
TOTAL	7.51	

4.1.1 Changes to the mapped native vegetation extent

Based on our review of the SVTM, the study area comprises PCT 3185 – Far South Riverflat Wet Forest and PCT 3659 – South Coast hinterland Silvertop Ash (**Figure 3-8**). However, our field surveys found no PCT 3185 or PCT 3659 within the study area. Our data confirms that the existing SVTM is incorrect, and that the vegetation present is more closely aligned with PCT 3181 - Bega Wet Shrub Forest, PCT 3192 - South Coast Riverflat Ribbon Gum Forest and PCT 4061 - Bega-Towamba Riparian Scrub (**Figure 4-1**).

4.1.2 Areas that are not native vegetation

A large portion of the study area comprises of heavily cultivated exotic grasslands. This is detailed on **Figure 4-1**. To confirm this, three VI plots were completed in this zone and were dominated by non-native species. For the purpose of the BAM-C and calculation of vegetation integrity scores, this area of vegetation was assigned as PCT 3181 - exotic grasslands.

4.2 PLANT COMMUNITY TYPES

4.2.1 Overview

Vegetation within the study area has been assessed as aligning with the BioNet Vegetation Classification PCTs identified within **Table 4-2** and their extent is shown in **Figure 4-1**. A detailed description of the PCTs and each zone is provided.

Table 4-2: PCTs identified within the study area

PCT no.	PCT name	Condition Class	Vegetation Zone	VI plot no.	Area (ha)
3181	Bega Wet Shrub Forest	Exotic grassland	Veg Zone 1	4, 5, 6	5.92
3181	Bega Wet Shrub Forest	Scattered trees - exotic ground	Veg Zone 3	3	0.66
3181	Bega Wet Shrub Forest	DNG - poor	Veg Zone 4	7, 9	2.31
3181	Bega Wet Shrub Forest	DNG - moderate	Veg Zone 5	2	0.43
4061	Bega-Towamba Riparian Scrub	Poor-moderate	Veg Zone 2	8	1.85
3192	South Coast Riverflat Ribbon Gum Forest	Moderate	Veg Zone 6	1	1.75
Total					12.92

4.2.2 PCT 3181 - Bega Wet Shrub Forest

4.2.2.1 PCT overview

This PCT exists in the study area as both remnant trees with absent mid-storey and an almost exclusively exotic ground layer, and as a derived native grassland (DNG) form. The canopy within PCT 3181 consists of mostly Blue Box (*Eucalyptus baueriana*), with occasional Rough-barked Apple (*Angophora floribunda*) and River Peppermint (*Eucalyptus elata*). No areas of PCT 3181 contain an intact mid-storey, however scattered individual shrubs occur in places, including Tree Violet (*Melicytus dentatus*) and Mountain Kangaroo Apple (*Solanum linearifolium*). The ground layer is dominated by exotic species in areas containing a canopy, with grasses Kikuyu (*Cenchrus clandestinus*), Cocksfoot (*Dactylis glomeratus*), Yorkshire Fog (*Holcus lanatus*), Paspalum (*Paspalum dilatatum*) and Parramatta Grass (*Sporobolus africanus*) most common. Exotic forbs present include Chickweed (*Stellaria media*), Sowthistles (*Sonchus oleraceus and Sonchus asper*), *Plantago lanceolata*, Cudweed (*Gamochaeta americana*), and Catsear (*Hypochaeris radicata*).

Two condition classes of derived native grasslands (DNG) occur within the study area. A small section in the north-east edge of the study area is in a poor to moderate condition and includes a higher diversity of native grass species, including primarily Weeping Grass (*Microlaena stipoides var. stipoides*), Paddock Lovegrass (*Eragrostis leptostachya*) and occasional

Kangaroo Grass (*Themeda triandra*), with native forbs including Swamp Dock (*Rumex brownii*), Oxalis perenans, Geranium solanderi var. solanderi, Climbing Saltbush (*Einadia nutans subsp. nutans*), Sprawling Bluebell (*Wahlenbergia gracilis*) and Common Cotula (*Cotula australis*), and native sedges Knob Sedge (*Carex inversa*) and *Carex longebrachiata*. Exotic species here include grasses Kikuyu (*Cenchrus clandestinus*), Yorkshire Fog (*Holcus lanatus*), Paspalum (*Paspalum dilatatum*) and Parramatta Grass (*Sporobolus africanus*), and exotic forbs Lesser Hawkbit (*Leontodon saxatilis*), Dandelion (*Taraxacum officionale*), *Plantago lanceolata*, Cudweed (*Gamochaeta americana*), and Catsear (*Hypochaeris radicata*). Poorer condition areas of DNG derived from PCT 3181 consist of mostly Weeping Grass (*Microlaena stipoides var. stipoides*) along with exotic grasses and only occasional native forbs.

A complete list of flora species recorded is provided in **Appendix D**.

Table 4-3: PCT 3181 - Bega Wet Shrub Forest

PCT ID	3181
PCT name	Bega Wet Shrub Forest
Vegetation formation	Wet Sclerophyll Forests (Shrubby sub-formation)
Vegetation class	South Coast Wet Sclerophyll Forests
Per cent cleared value (%)	18.09
Extent within study area (hectares)	3.4
Plots completed	4

4.2.2.2 Condition

Two condition classes of derived native grasslands (DNG) occur within the study area. A small section in the north-east edge of the study area is in a poor to moderate condition and includes a higher diversity of native grass species. Poorer condition areas of DNG derived from PCT 3181 consist of mostly Weeping Grass (*Microlaena stipoides* var. *stipoides*) along with exotic grasses and only occasional native forbs.

4.2.2.3 Justification of PCT selection

The vegetation present, including Blue Box, occasional Rough-barked Apple, and River Peppermint canopy species, combined with landscape position and our professional opinion, was the justification for the PCT selection.

4.2.2.4 Alignment with TECs

Vegetation identified as PCT 3181 is not associated with a TEC.

4.2.2.5 Alignment with EPBC Act listed ECs

This PCT is not associated with an EC under the EPBC Act.

Photo 4-1: Corridor of mostly Bluebox (*Eucalyptus baueriana*) canopy along the western boundary of the study area forming PCT 3181

Photo 4-2: Derived native grasslands (DNG) from PCT 3181 in the north-western section of the study area

4.2.3 PCT 3192 – South Coast Riverflat Ribbon Gum Forest

PCT 3192 occurs along the Pambula River along the northern boundary of the study area, mostly as an island between two branches of the river. This PCT occurs as a variably dense canopy of mostly Ribbon Gum (*Eucalyptus viminalis*) and occasional River Peppermint (*Eucalyptus elata*), with a tall upper mid-storey of Black Wattle (*Acacia mearnsii*) and White Sally (*Acacia floribunda*). A lower mid-storey includes a diversity of shrubs including *Cassinia trinervia*, *Beyeria lasiocarpa*, Brush Currajong (*Androcalva fraseri*), Bracelet Honey-myrtle (*Melaleuca armillaris*), Burgan (*Kunzea ericoides*), Twin-flower Tea Tree (*Leptospermum emarginatum*), Hazel Pomaderris (*Pomaderris aspera*), Pomaderris cinerea and Native Peach (*Trema tomentosa var. aspera*). The ground layer is complex in this PCT as it includes periodically inundated sections adjacent to the main stream, with aquatic and semi-aquatic species including sedge *Schoenoplectus validus*, *Carex longebrachiata* and *Isolepis sp*, rush *Juncus continuus*, forbs *Callitriche muelleri*, *Persicaria praetermissa*, Australian Brooklime (*Gratiola peruviana*) and Swamp Stonecrop (*Crassula helmsii*), and grass Swamp Millet (*Isachne globosa*) present. More elevated sections include forbs *Hydrocotyle tripartita*, *Hackelia latifolia*, Fireweed Groundsel (*Senecio linearifolius*), *Plectranthus parviflorus*, Whiteroot (*Lobelia purpurescens*) and Forest Nightshade (*Solanum prinophyllum*), grasses Weeping Grass (*Microlaena stipoides*), *Poa labillardierei* and Bordered Panic (*Entolasia marginata*), ferns Bracken (*Pteridium esculentum*), Fishbone Water Fern (*Blechnum nudum*), Harsh Ground Fern (*Hypolepis muelleri*) and Sickle Fern (*Pellaea falcata*), and climbers *Sicyos australis*, *Calystegia marginata*, Snake Vine (*Stephania japonica*) and Wombat Berry (*Eustrephus latifolius*). Exotic species present in this PCT include scattered Willow trees (*Salix spp.*), Blackberry (*Rubus fruticosus sp. agg.*), and grasses including Kikuyu (*Cenchrus clandestinus*), *Setaria parviflora* and Paspalum (*Paspalum dilatatum*), and forbs *Tradescantia fluminensis*, Arum Lily (*Zantedechia aethiopica*) and Inkweed (*Phytolacca octandra*), and climbers Turkey Rhubarb (*Acetosa sagittata*) and Cape Ivy (*Delairea odorata*). Exotic aquatic species include Parrots Feather (*Myriophyllum aquaticum*), Watercress (*Rorippa nasturtium-aquaticum*), Blue Water-speedwell (*Veronica anagallis-aquatica*). This PCT intergrades with PCT 4061 to the west, where the canopy trees drop out.

A complete list of flora species recorded is provided in **Appendix D**.

Table 4-4: PCT 3192 - South Coast Riverflat Ribbon Gum Forest

PCT ID	3192
PCT name	South Coast Riverflat Ribbon Gum Forest
Vegetation formation	Wet Sclerophyll Forests (Shrubby sub-formation)
Vegetation class	South Coast Wet Sclerophyll Forests
Per cent cleared value (%)	8.26
Extent within study area (hectares)	1.75
Plots completed	1

4.2.3.1 Condition

This vegetation zone is considered to be in moderate condition.

4.2.3.2 Justification of PCT selection

The vegetation present, including Ribbon Gum, occasional River Peppermint, Black Wattle and White Sally canopy and tall upper mid-storey species, combined with landscape position and our professional opinion, was the justification for the PCT selection.

4.2.3.3 Alignment with TECs

PCT 3192 in the study area conforms to the NSW BC Act listed threatened ecological community River-Flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions.

4.2.3.4 Alignment with EPBC Act listed ECs

This PCT is not associated with an EC under the EPBC Act.

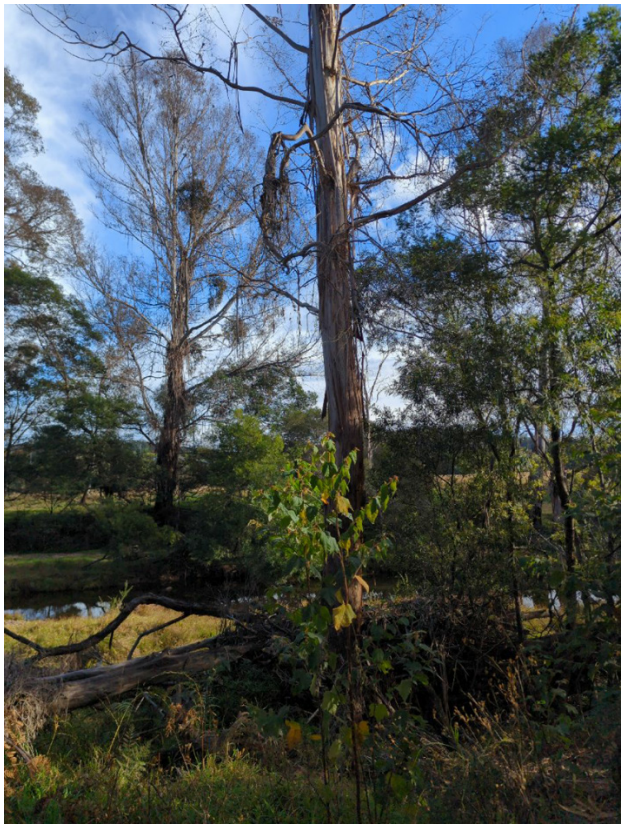


Photo 4-3: PCT 3192 in the north-east of the study area adjacent to the Pambula River main channel

4.2.4 PCT 4061 - Bega-Towamba Riparian Scrub

4.2.4.1 PCT overview

PCT 4061 occurs along the western section of the northern boundary of the study area along Pambula River. This PCT exists on the study area as a patchy shrubland with shrubs becoming sparser as the zone becomes dominated by sedges and rushes towards the west. No canopy is present in this zone. The mid-storey includes shrubs Bracelet Honey-myrtle (*Melaleuca armillaris*), *Melaleuca parvistaminea*, *Callistemon subulatus* and occasional White Sally (*Acacia floribunda*). The ground-storey includes a matrix of sedgeland and grassland, including sedges *Carex longebrachiata* and *Schoenopectus validus*, rushes *Typha orientalis* and *Juncus continuus*, and grasses Swamp Millet (*Isachne globosa*) and Couch (*Cynodon dactylon*). Forbs present include River Buttercup (*Ranunculus inundatus*), Slender Knotweed (*Persicaria decipiens*), *Lomandra longifolia* and *Hydrocotyle acutiloba*, and fern *Pteridium esculentum*. Weeds are more common further away from the main stream and include grasses Kikuyu (*Cenchrus clandestinus*), Paspalum (*Paspalum dilatatum*) and *Setaria parviflora*, forbs Clustered Dock (*Rumex conglomeratus*), Goosegrass (*Galium aparine*) and Spear Thistle (*Cirsium vulgare*), and rush *Juncus bulbosus*.

A complete list of flora species recorded is provided in **Appendix D**.

Table 4-5: PCT 4061 - Bega-Towamba Riparian Scrub

PCT ID	4061
PCT name	Bega-Towamba Riparian Scrub
Vegetation formation	Forested Wetlands
Vegetation class	Eastern Riverine Forests
Per cent cleared value (%)	69.09
Extent within study area (hectares)	1.85
Plots completed	1

4.2.4.2 Condition

This vegetation zone is considered to be in poor-moderate condition.

4.2.4.3 Justification of PCT selection

The vegetation present, including Bracelet Honey-myrtle, *Melaleuca parvistaminea*, *Callistemon subulatus* and occasional White Sally mid-storey species, combined with landscape position and our professional opinion, was the justification for the PCT selection.

4.2.4.4 Alignment with TECs

Vegetation identified as PCT 4061 is not associated with a TEC.

4.2.4.5 Alignment with EPBC Act listed ECs

This PCT is not associated with an EC under the EPBC Act.

Photo 4-4: Bega-Towamba Riparian Scrub within the study area

Photo 4-5: Bega-Towamba Riparian Scrub within the study area

4.2.5 Exotic Grasslands

The large southern portion of the study area comprises heavily cultivated exotic grasslands. These areas are dominated by the exotic grass Kikuyu (*Cenchrus clandestinus*), with other exotic grasses Yorkshire Fog (*Holcus lanatus*), Cocksfoot (*Dactylis glomeratus*), Paspalum (*Paspalum dilatatum*), Browntop Bent (*Agrostis capillaris*), Phalaris (*Phalaris aquatica*) and Parramatta Grass (*Sporobolus africanus*) also commonly occurring. Exotic forbs are typically present but are low in cover, including Catsear (*Hypochaeris radicata*), Fireweed (*Senecio madagascariensis*), White Clover (*Trifolium repens*) and Hemlock (*Conium maculatum*). Native species are rare in this zone, however occasional patches of Weeping Grass (*Microlaena stipoides var. stipoides*) are present, along with scattered Swamp Dock (*Rumex brownii*) and *Geranium solanderi*. Very occasional scattered Blue Box (*Eucalyptus baueriana*) occur within the exotic grassland, indicating that the historical PCT in this area would likely have been PCT 3181. These areas are within vegetation zone 1, and given the low VI score of these area (0.2/100), they are best described as exotic grasslands.

Photo 4-6: Exotic grasslands in the south of the study area

4.3 FAUNA

4.3.1 Species Richness

A total of 44 fauna species were recorded during the survey period within or adjacent to the study area. These comprised of:

- 36 bird species
- five mammal species
- three frog species

Appendix E provides a species list detailing these.

4.3.2 Fauna Assemblages

Fauna assemblages were determined by pooling all data from each survey method within each habitat type. These can be summarised as follows:

Birds

The assemblage of birds recorded during this study is considered somewhat diverse and typical of agricultural environments with adjoining forests of south eastern NSW. Birds commonly recorded included the Australian Magpie, Australian Raven and Jacky Winter.

Mammals

Mammal assemblages of the study area comprised of five species, including one introduced species. The Eastern Grey Kangaroo were common within the study area due to abundant exotic grass cover. No microbats were recorded, which was surprising given the nearby riparian area and large area of forest to the south.

Frogs

The study area supports frog fauna both in the grassy areas and along Pambula River. The most common frog was the Clicking Froglet, closely followed by the Southern Brown Tree Frog. The Southern Leaf-green Tree Frog was only recorded in grass patches adjacent to the river and the Southern Brown Tree Frog was only recorded during the nocturnal survey.

Reptiles

No reptile species were recorded due to the winter season of survey. Reptiles are generally inactive during the colder months of winter. However, given that Pambula River crosses the study area, reptile species that could potentially inhabit the study area include the Gippsland Water Dragon and Yellow-bellied Water Skink.

4.3.3 Fauna Habitats

Three broad habitat types were identified within the study area. These comprise of:

Existing Clearings

This habitat type corresponds with the vegetation mapped as exotic grassland. Of little value to threatened fauna species, existing clearings do provide an ecotone to adjoining habitats. This can be advantageous to some species that forage along the interface, while having a negative influence through edge effects such as predation and wind throw.

No threatened fauna were detected within existing clearings of the study area.


Photo 5-7 & Photo 5-8: Cleared land within the study area

Scattered trees

This habitat type consists of Blue Box (*Eucalyptus baueriana*), with occasional Rough-barked Apple (*Angophora floribunda*) and River Peppermint (*Eucalyptus elata*). One hollow-bearing tree containing one small hollow was recorded within the study area (**Figure 4-2**).

No threatened fauna were recorded within this habitat type and is considered of little value to threatened fauna species.


Photo 5-9 & Photo 5-10: Scattered trees within the study area

Water Bodies

One water body was identified within the study area. This being Pambula River crossing the northern section of the study area.

This water body is likely to provide some contribution to the fauna assemblages present and within adjoining habitats. Numerous avifauna were detected that are generally associated with this habitat type including Superb Fairy-wren, Grey Fantail and White-faced Heron.


Photo 5-11 & Photo 5-12: Pambula River within the study area

4.4 THREATENED ECOLOGICAL COMMUNITIES

PCT 3192 in the study area conforms to the NSW BC Act listed threatened ecological community River-Flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions (**Figure 4-3**).

4.5 VEGETATION INTEGRITY (VEGETATION CONDITION)

4.5.1 Vegetation integrity survey plots

The minimum number of VI plots in accordance with BAM has been completed for this BAR. This level of survey effort was deemed appropriate given the relatively small area and high level of previous disturbance within the study area. BAM data sheets for the BAM-C is provided in **Appendix B**.

4.5.2 Scores

The Vegetation Integrity scores (VIS) of each vegetation zone within the study area was calculated using the BAM-C. The results of these are provided in **Table 4-4.** The areas mapped as PCT 3192 have a moderate VIS (43.2), while other vegetated areas of the study area (PCT 3183 - exotic grasslands etc) have an extremely low to low VIS (0.2 to 14.9) confirming they are of virtually no value to biodiversity. The vegetation zones are shown on **Figure 4-4**.

Table 4-6: Vegetation integrity scores for the study area

Vegetation zone ID	Composition condition score	Structure condition score	Function condition score (where relevant)	Vegetation integrity score	Hollow bearing trees present?
1 (PCT 3181 - exotic grassland)	0.6	0	15	0.2	No

Vegetation zone ID	Composition condition score	Structure condition score	Function condition score (where relevant)	Vegetation integrity score	Hollow bearing trees present?
2 (PCT 4061 - poor-moderate)	33.8	47.5	15	28.9	No
3 (PCT 3181 - scattered trees)	2.4	31	44	14.9	Yes (1)
4 (PCT 3181 - poor)	4.4	15.2	15	10	No
5 (PCT 3181 - moderate)	17.9	15.2	15	16	No
6 (PCT 3192 - moderate)	62.7	31.3	41	43.2	No

4.5.3 Use of benchmark data

During the preparation of this BAR, BAM-C calculations have not used any benchmark data but have relied upon data collected during field surveys.

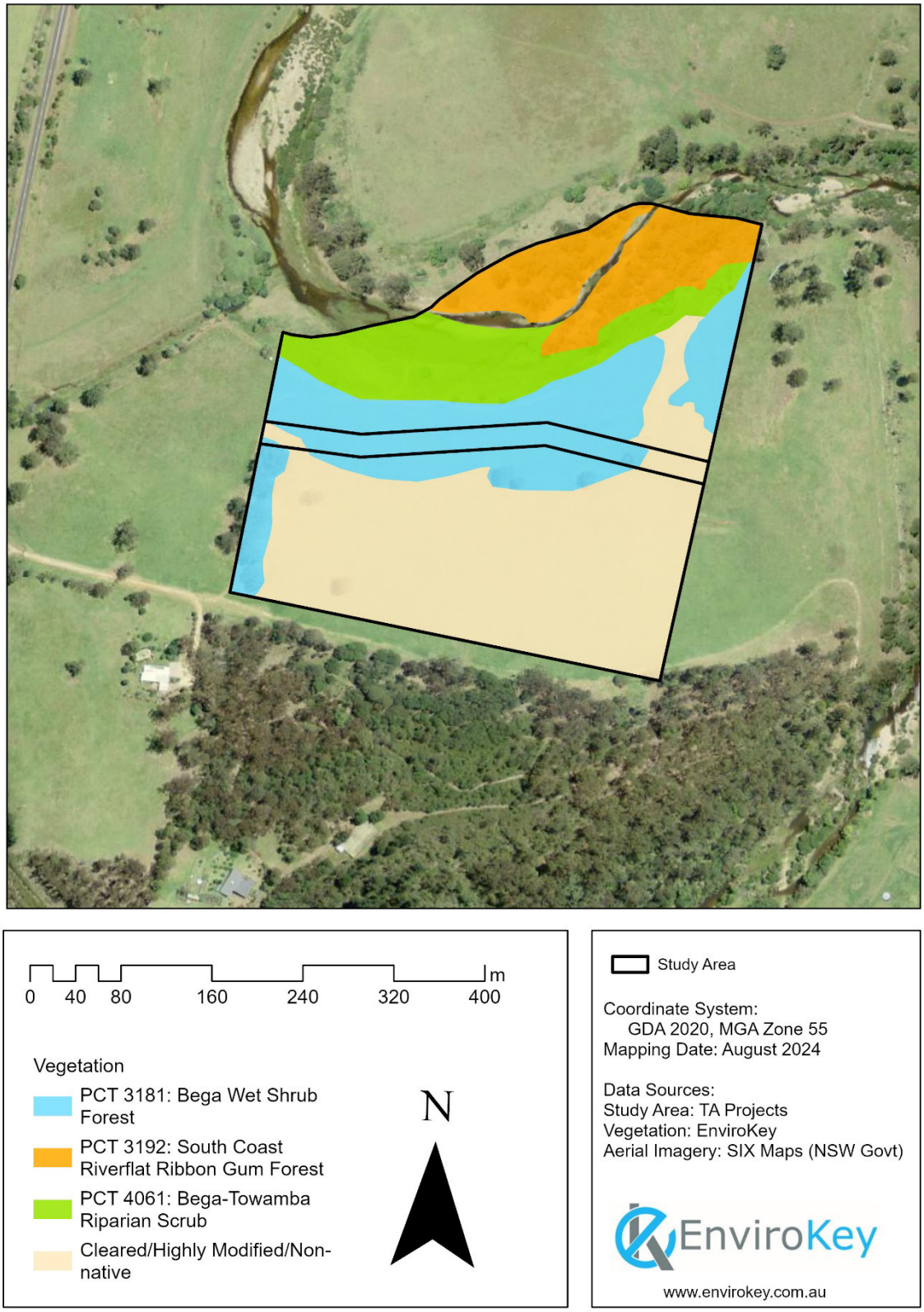


Figure 4-1: Plant communities within the study area

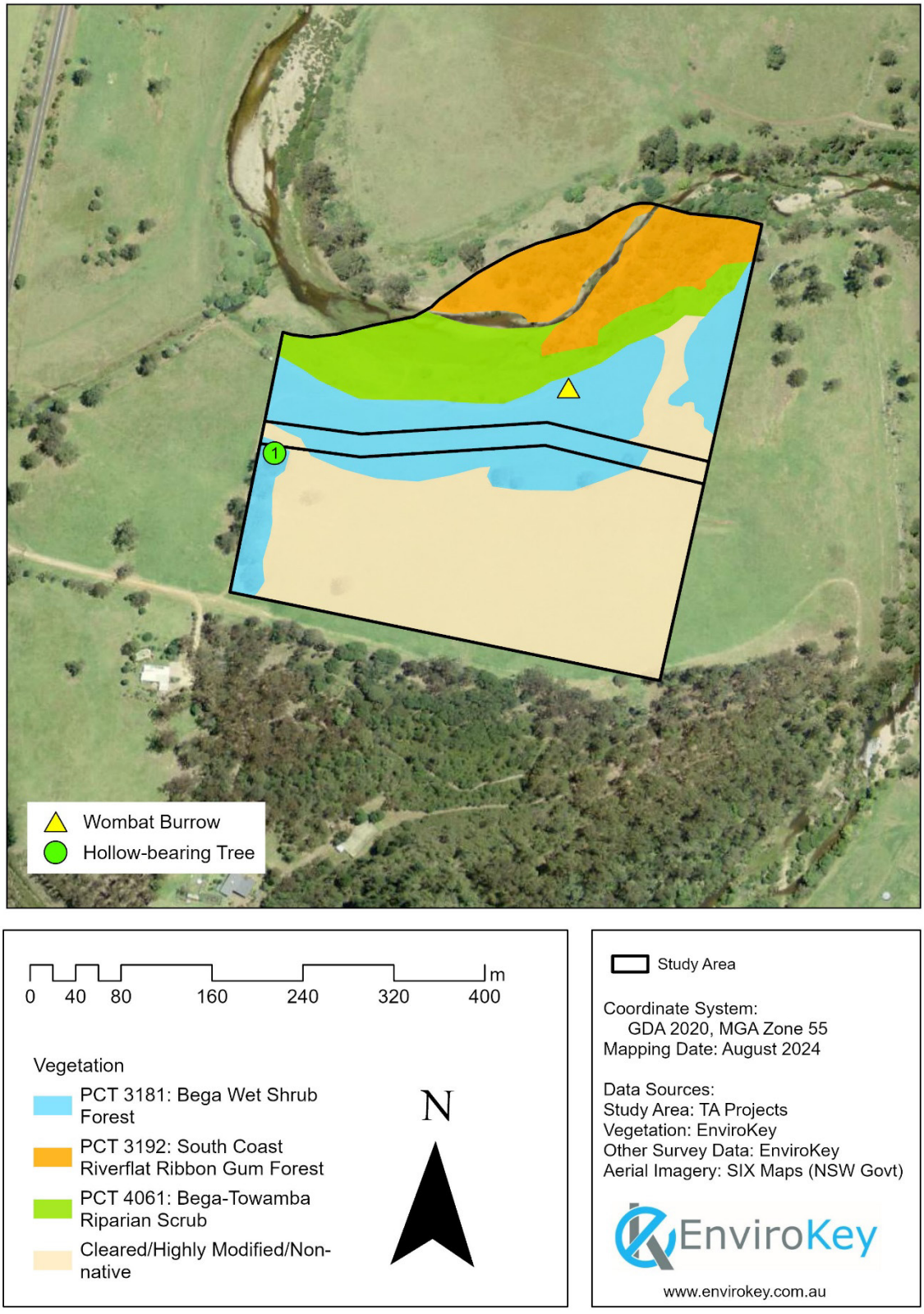


Figure 4-2: Fauna habitat within the study area

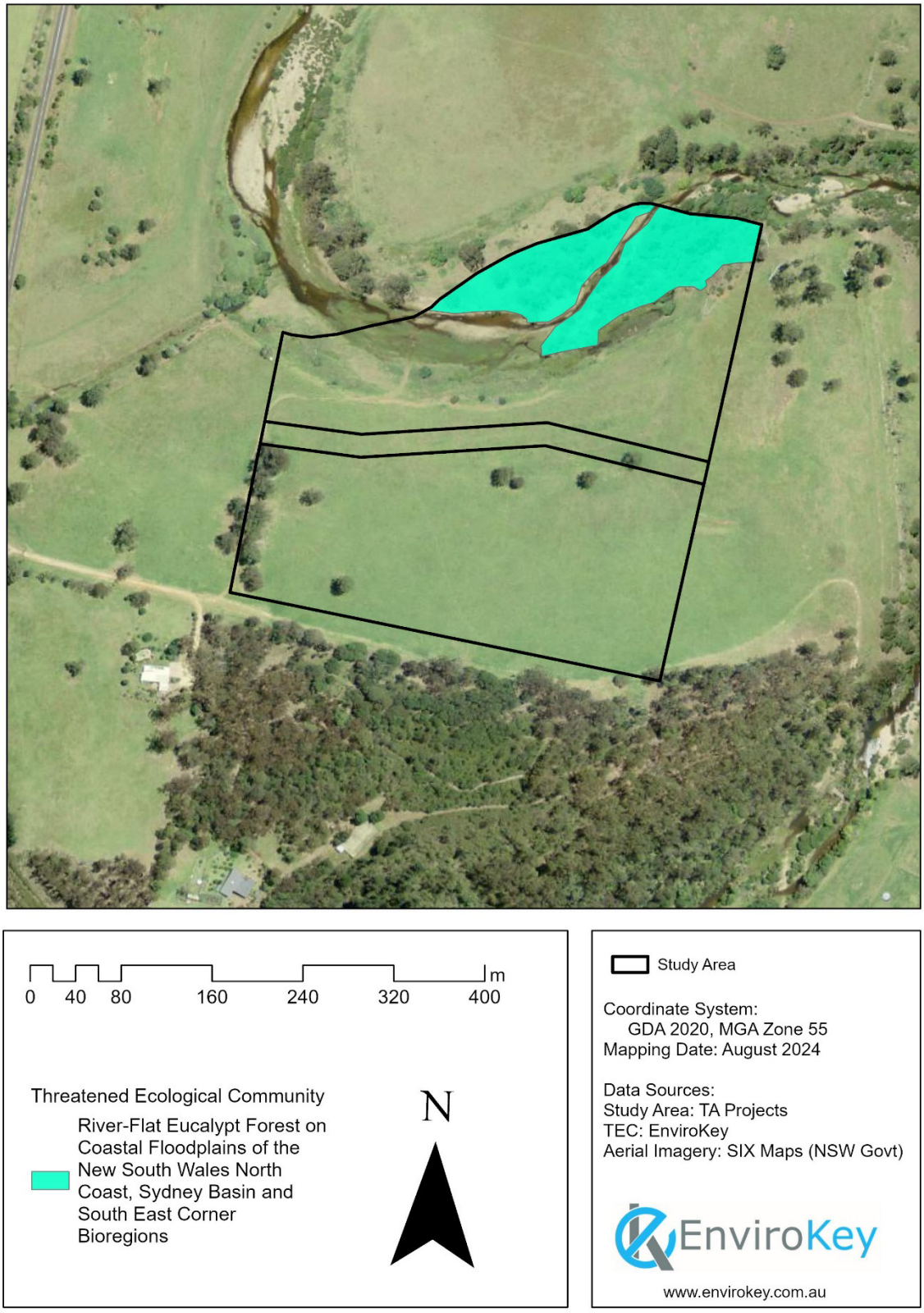


Figure 4-3: Threatened Ecological Community within the study area

Figure 4-4: Vegetation zones within the study area

5 HABITAT SUITABILITY FOR THREATENED SPECIES

5.1 IDENTIFICATION OF THREATENED SPECIES FOR ASSESSMENT

Section 5 of the BAM details the process for determining the habitat suitability for threatened species. Under the BAM, threatened species are separated into two categories; 'ecosystem' or 'species' credit species. Those threatened species where the likelihood of occurrence of a species or components of the species' habitat can be predicted by vegetation surrogates and landscape features, or for which a targeted survey has a low probability of detection, are identified as 'ecosystem' credit species. Targeted surveys are not required for ecosystem species and potential impacts to these species are assessed in conjunction with impacts to each PCT. Existing threatened species records within the locality were also reviewed (**Figure 5-1** to **Figure 5-3**). The BAM-C generates a list of ecosystem and species credit species.

Threatened species where the likelihood of occurrence of a species or elements of suitable habitat for the species cannot be confidently predicted by landscape features or vegetation surrogates and can be reliably detected by survey, are identified as 'species' credit species. A targeted survey or an expert report is required to confirm the presence or absence of these species in the study area.

For some threatened species, they are identified as both ecosystem and species credit species, with different aspects of the habitat and life cycle representing different credit types. Commonly, threatened fauna species may have foraging habitat as an ecosystem credit, while their breeding habitat represents a species credit.

The following sections outline the process for determining the habitat suitability for threatened species within the study area, and the results of targeted surveys for candidate threatened species.

5.1.1 Ecosystem credit species

Threatened species that require assessment are initially identified based on a specific set of criteria. These being:

- The distribution of the species includes the IBRA subregion of the study area (assessment area)
- The study area (assessment area) has geographic constraints of the species distribution within the IBRA subregion
- The species is associated with the PCTs of the study area (assessment area)
- Native vegetation cover within a 1500 metre buffer of the study area (assessment area) exceeds the minimum habitat required for the species
- Patch size exceeds the minimum required for the species

- The species is identified as an ecosystem or species credit species in the Threatened Biodiversity Data Collection.

Ecosystem Credit Species are defined by BAM as species for which the likelihood of occurrence or the presence of potential habitat can be predicted based on vegetation proxies and landscape features, or species for which targeted surveys have a low probability of detection (DPE, 2020). No ecosystem species were removed from the list generated by the BAM-C for the study area.

5.1.2 Species credit species

As with ecosystem credit species, species credit species are predicted in the BAM-C following an assessment of geographic and habitat features which include the IBRA subregion, PCT, patch size and native vegetation cover in the landscape context.

This section includes further assessment of species credit species to confirm if they will become candidate species for this BA. Section 5.2 of the BAM provides the opportunity to consider whether a predicted candidate species is unlikely to occur within the study area where habitat is substantially degraded to a point that they would be unlikely to utilise, or where an expert report identifies that the species is unlikely to be present. A predicted candidate species credit species that is not considered to have suitable habitat present does not require further assessment. However, the reasons for making these determinations must be documented.

To inform this assessment of how habitat degradation has impacted candidate threatened species, a search of the Atlas of NSW Wildlife (DPE/BCS, 2024a) was carried out for a 10 kilometre radius around the assessment area. Using these existing records, the likelihood of occurrence was assessed using the following methods:

- Species occurrence within the study area and locality
- Condition and extent of available habitats
- Application of the knowledge and experience of the EnviroKey Principal Ecologist.

Table 5-2 outlines the predicted candidate species (from the BAM-C) and provides a justification for the decision by **EnviroKey** to either maintain or discard each species as a candidate species based on the presence of suitable habitat within the study area.

Table 5-1: Predicted ecosystem credit species

Common name	Scientific name	Listing status		Dual credit species	Sources	Retain for further assessment (Y/N)	Reason for exclusion from further assessment	PCT ID
		BC Act	EPBC Act					
Australasian Bittern	*Botaurus poiciloptilus*	E	E	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	-	PCT 4061
Black Bittern	*Ixobrychus flavicollis*	V	-	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	-	PCT 3181, 4061, 3192
Brown Treecreeper (eastern subspecies)	*Climacteris picumnus victoriae*	V	V	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	-	PCT 3181, 4061, 3192
Dusky Woodswallow	*Artamus cyanopterus cyanopterus*	V	-	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	-	PCT 3181, 4061, 3192

Common name	Scientific name	Listing status		Dual credit species	Sources	Retain for further assessment (Y/N)	Reason for exclusion from further assessment	PCT ID
		BC Act	EPBC Act					
Eastern False Pipistrelle	*Falsistrellus tasmaniensis*	V	-	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	-	PCT 3181
Flame Robin	*Petroica phoenicea*	V	-	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	-	PCT 3181, 4061, 3192
Gang-gang Cockatoo	*Callocephalon fimbriatum*	E	E	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	-	PCT 3181, 4061, 3192
Greater Broad-nosed Bat	*Scoteanax rueppellii*	V	-	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	-	PCT 3181
Grey-headed Flying fox	*Pteropus poliocephalus*	V	V	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey	Yes	-	PCT 3181, 4061, 3192

Common name	Scientific name	Listing status		Dual credit species	Sources	Retain for further assessment (Y/N)	Reason for exclusion from further assessment	PCT ID
		BC Act	EPBC Act					
					☐ Current survey			
Large Bent-winged Bat	*Miniopterus orianae oceanensis*	V	-	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	-	PCT 3181
Little Eagle	*Hieraaetus morphnoides*	V	-	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	-	PCT 3181, 4061, 3192
Little Lorikeet	*Glossopsitta pusilla*	V	-	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	-	PCT 3181, 4061, 3192
Purple-crowned Lorikeet	*Glossopsitta porphyrocephala*	V	-	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	-	PCT 3181, 3192

Common name	Scientific name	Listing status		Dual credit species	Sources	Retain for further assessment (Y/N)	Reason for exclusion from further assessment	PCT ID
		BC Act	EPBC Act					
Regent Honeyeater	*Anthochaera phrygia*	CE	CE	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	No suitable foraging or breeding habitat present	PCT 3181, 4061
Scarlet Robin	*Petroica boodang*	V	-	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	-	PCT 3181, 4061, 3192
South-eastern Glossy Black-Cockatoo	*Calyptorhynchus lathami lathami*	V	V	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	-	PCT 3181, 4061, 3192
South-eastern Hooded Robin	*Melanodryas cucullata cucullata*	E	E	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	-	PCT 3181, 4061, 3192
Speckled Warbler	*Chthonicola sagittata*	V	-	No	☒ BAM-C ☐ TBDC ☐ Previous survey	Yes	-	PCT 4061

Common name	Scientific name	Listing status		Dual credit species	Sources	Retain for further assessment (Y/N)	Reason for exclusion from further assessment	PCT ID
		BC Act	EPBC Act					
					☐ Current survey			
Spotted Harrier	*Circus assimilis*	V	-	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	-	PCT 4061
Spotted-tailed Quoll	*Dasyurus maculatus*	V	E	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	-	PCT 3181, 4061, 3192
Square-tailed Kite	*Lophoictinia isura*	V	-	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	-	PCT 3181, 4061, 3192
Swift Parrot	*Lathamus discolor*	E	CE	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	-	PCT 3181, 4061, 3192

Common name	Scientific name	Listing status		Dual credit species	Sources	Retain for further assessment (Y/N)	Reason for exclusion from further assessment	PCT ID
		BC Act	EPBC Act					
Turquoise Parrot	*Neophema pulchella*	V	-	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	-	PCT 4061
Varied Sittella	*Daphoenositta chrysoptera*	V	-	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	-	PCT 3181, 4061, 3192
White-bellied Sea Eagle	*Haliaeetus leucogaster*	V	MA	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	-	PCT 3181, 4061, 3192
White-throated Needletail	*Hirundapus caudacutus*	-	V MA MI	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	-	PCT 3181, 4061, 3192
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*	V	-	No	☒ BAM-C ☐ TBDC ☐ Previous survey	Yes	-	PCT 3181

Common name	Scientific name	Listing status		Dual credit species	Sources	Retain for further assessment (Y/N)	Reason for exclusion from further assessment	PCT ID
		BC Act	EPBC Act					
					☐ Current survey			

Table 5-2: Predicted candidate species credit species

Common name	Scientific name	Listing status		Sources	Potential for further assessment in BDAR (Y/N)
		BC Act	EPBC Act		
Araluen Gum	*Eucalyptus kartzoffiana*	V	V	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No
Bega Wattle	*Acacia georgensis*	V	V	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No
Black Gum	*Eucalyptus aggregata*	V	V	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No

Common name	Scientific name	Listing status		Sources	Potential for further assessment in BDAR (Y/N)
		BC Act	EPBC Act		
Bush Stone-curlew	*Burhinus grallarius*	E	-	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No
Cotoneaster Pomaderris	*Pomaderris cotoneaster*	E	E	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No
Gang-gang Cockatoo	*Callocephalon fimbriatum*	E	E	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No
South-eastern Glossy Black Cockatoo	*Calyptorhynchus lathami lathami*	V	V	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No
Eastern Pygmy-possum	*Cercartetus nanus*	V	-	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No

Common name	Scientific name	Listing status		Sources	Potential for further assessment in BDAR (Y/N)
		BC Act	EPBC Act		
Large-eared Pied Bat	*Chalinolobus dwyeri*	V	E	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No
Chef's Cap Correa	*Correa baeuerlenii*	V	V	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	V	MA	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No
Giant Burrowing Frog	*Heleioporus australiacus*	V	V	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No
Little Eagle	*Hieraaetus morphnoides*	V	-	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No

Common name	Scientific name	Listing status		Sources	Potential for further assessment in BDAR (Y/N)
		BC Act	EPBC Act		
Southern Brown Bandicoot (eastern)	*Isoodon obesulus obesulus*	E	E	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No
Ralston's Leionema	*Leionema ralstonii*	V	V	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No
Regent Honeyeater	*Anthochaera phrygia*	CE	CE	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No
Swift Parrot	*Lathamus discolor*	E	CE	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No
Green and Golden Bell Frog	*Litoria aurea*	E	V	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No

Common name	Scientific name	Listing status		Sources	Potential for further assessment in BDAR (Y/N)
		BC Act	EPBC Act		
Square-tailed Kite	*Lophoictinia isura*	V	-	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No
Large Bent-winged Bat	*Miniopterus orianae oceanensis*	V	-	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No
Stuttering Frog	*Mixophyes balbus*	E	V	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No
Southern Myotis	*Myotis macropus*	V	-	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No
Barking Owl	*Ninox connivens*	V	-	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No

Common name	Scientific name	Listing status		Sources	Potential for further assessment in BDAR (Y/N)
		BC Act	EPBC Act		
Powerful Owl	*Ninox strenua*	V	-	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No
Southern Greater Glider	*Petauroides volans*	E	E	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No
Squirrel Glider	*Petaurus norfolcensis*	V	-	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No
Pink Robin	*Petroica rodinogaster*	V	-	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No
Brush-tailed Phascogale	*Phascogale tapoatafa*	V	-	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No

Common name	Scientific name	Listing status		Sources	Potential for further assessment in BDAR (Y/N)
		BC Act	EPBC Act		
Koala	*Phascolarctos cinereus*	E	E	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No
Long-nosed Potoroo	*Potorous tridactylus*	V	V	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No
Grey-headed Flying-fox	*Pteropus poliocephalus*	V	V	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No
Scrub Turpentine	*Rhodamnia rubescens*	CE	CE	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No
Masked Owl	*Tyto novaehollandiae*	V	-	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No

No predicted ecosystem credit species were removed from the BAM-C.

All 33 species credit species would not require further assessment if a biodiversity impact assessment was required to support a development application. The justification for these being removed is as follows:

- Araluen Gum – site is well south of the Araluen, Bendethera and Majors Creek areas – species does not occur in the region (DPE/BCS, 2024b)
- Barking Owl – site does not contain woodland or forest vegetation, Pambula River that intersects the study area is not continuously timbered, with agricultural land use adjacent – no suitable breeding habitat present (Kavanagh et al., 1995)
- Bega Wattle – the site does not contain exposed rock – no suitable habitat present (DPE/BCS, 2024b)
- Black Gum – site is not within the South Eastern Highlands Bioregion – species does not occur in the region (DPE/BCS, 2024b)
- Brush-tailed Phascogale – site does not contain forest vegetation, nor does it contain abundant tree hollows – no suitable habitat present (van der Ree et al., 2001)
- Bush Stone-curlew – site is within the far south-east corner – species does not occur in this region (DPE/BCS, 2024b)
- Chef's Cap Correa – site does not contain forest vegetation or rocky areas – no suitable habitat present (DPE/BCS, 2024b)
- Contoneaster Pomaderris – site does not contain forest vegetation – no suitable habitat present (DPE/BCS, 2024b)
- Eastern Pygmy-possum – site does not contain forest or woodland vegetation, one small hollow-bearing tree was recorded, however this tree is isolated within agricultural land with no habitat connectivity – no suitable habitat present (Ward, 1990)
- Gang-gang Cockatoo – site does not contain box-gum or box-ironbark species, nor does it contain suitable hollows for nesting– no suitable habitat present (DPE/BCS, 2024b)
- Green and Golden Bell Frog – site does not contain a marsh, dam, or stream – no suitable breeding habitat present (Pyke & White, 1996)
- Giant Burrowing Frog – site is degraded, does not contain heath, woodland, or forest vegetation, nor does it contain first or second order streams – no suitable habitat present (Penman et al., 2006)
- Grey-headed Flying-fox – site is within agricultural land absent of woodland or forest vegetation – no suitable habitat present (DPE/BCS, 2024b)
- Koala – site is within agricultural land absent of woodland or forest vegetation – no suitable habitat present (DPE/BCS, 2024b)
- Large Bent-winged Bat – site does not contain any caves, tunnels, mines, culverts, or other breeding structures – no breeding habitat present (Baudinette et al., 1994; van Harten, 2020; White, 2011; Wilson, 2003)
- Large-eared Pied Bat – site does not contain forest vegetation, caves, cliffs or mine shafts – no breeding habitat present (Williams & Thomson, 2018)

- Little Eagle – site does not contain forest or woodland vegetation – no suitable habitat present (Debus et al., 2007)
- Long-nosed Potoroo – site is within agricultural land absent of woodland or forest vegetation – no suitable habitat present (DPE/BCS, 2024b)
- Masked Owl – site does not contain forest or woodland vegetation, nor does it contain any large hollow-bearing trees – no suitable breeding habitat present (Kavanagh, 1996)
- Pink Robin – site does not contain forest vegetation or gullies – no suitable habitat present (DPE/BCS, 2024b)
- Powerful Owl – site does not contain forest or woodland vegetation, nor does it contain any large hollow-bearing trees – no suitable breeding habitat present (Webster et al., 1999)
- Ralston's Leionema – site does not contain rocky areas or forest vegetation – no suitable habitat present (DPE/BCS, 2024b)
- Regent Honeyeater – site does not contain forest or woodland vegetation and is well south of the NSW breeding region – no suitable habitat present (DoE, 2016)
- Scrub Turpentine – site is well south of its southern extent of Batemans Bay – species does not occur in the region (DPE/BCS, 2024b)
- Southern Brown Bandicoot – site does not contain forest or heath vegetation – no suitable habitat present (NPWS, 2001)
- South-eastern Glossy Black Cockatoo – site does not contain *Allocasuarina* species, nor does it contain nesting hollows – no suitable habitat present (Clout, 1989)
- Southern Greater Glider – site does not contain woodland or forest vegetation, nor does it contain any suitable hollow-bearing trees – no denning habitat present (DPE/BCS, 2024b)
- Southern Myotis – site does not contain any caves, mine shafts, bridges or culverts – site does not contain suitable roosting or breeding habitat (DPE/BCS, 2024b)
- Square-tailed Kite – site does not contain woodland or forest vegetation, Pambula River that intersects the study area is not continuously timbered, with agricultural land use adjacent – no suitable breeding habitat present (NPWS, 1999)
- Squirrel Glider – site does not contain woodland vegetation, nor does it contain abundant tree hollows – no suitable breeding habitat (Ball, 2007)
- Stuttering Frog – site is highly degraded with agricultural land use adjacent to the river section of the study area – no suitable habitat present (Daly, 1998; Daly et al., 2002)
- Swift Parrot - species breeds only in Tasmania, not the mainland – no breeding habitat present (BirdsAustralia, 2011; Garnett & Baker, 2020)
- White-bellied Sea-Eagle – site does not contain a large river or tall forest trees – no suitable habitat present (PALEI et al.).

5.2 PRESENCE OF CANDIDATE SPECIES CREDIT SPECIES

This section outlines the determination of candidate species credit species occurrence within the study area. For all species, presence of candidate species was determined by field survey.

Table 5-3: Determining the presence of candidate flora species credit species within the study area

Common name	Scientific name	Listing status		Method used to determine presence	Present (Y/N)
		BC Act	EPBC Act		
Araluen Gum	*Eucalyptus kartzoffiana*	V	V	Targeted threatened species survey	No
Bega Wattle	*Acacia georgensis*	V	V	Targeted threatened species survey	No
Black Gum	*Eucalyptus aggregata*	V	V	Targeted threatened species survey	No
Chef's Cap Correa	*Correa baeuerlenii*	V	V	Targeted threatened species survey	No
Cotoneaster Pomaderris	*Pomaderris cotoneaster*	E	E	Targeted threatened species survey	No
Ralston's Leionema	*Leionema ralstonii*	V	V	Targeted threatened species survey	No
Scrub Turpentine	*Rhodamnia rubescens*	CE	CE	Targeted threatened species survey	No

5.3 THREATENED SPECIES SURVEYS

Targeted threatened species survey efforts for flora and fauna were conducted over the following periods:

- 22 & 23 July 2024 (threatened fauna search) – 1 person for 6 hours
- 22 & 23 July 2024 (BAM plots and threatened flora transects) – 1 person for 10 hours

5.3.1 Flora

Targeted threatened species surveys for flora were carried out using one method, a targeted threatened flora transect across the study area. Threatened flora species searches were carried out in accordance with the TDBC and while surveys were conducted out of season, the Senior Botanist is highly experienced with threatened flora species of the locality and can accurately identify these species outside of their flowering period given their extensive experience within the Bega Valley.

5.3.2 Fauna

Targeted threatened species surveys were carried out during diurnal and nocturnal surveys. Bird surveys were carried out across the study area, and one nocturnal survey was carried out within the study area. No candidate fauna species credit species were confirmed due to no presence of breeding, foraging, or general habitat within the study area which is consistent with our analysis in section 5.1 of this BAR.

5.4 EXPERT REPORTS

No export reports were used for this BAR.

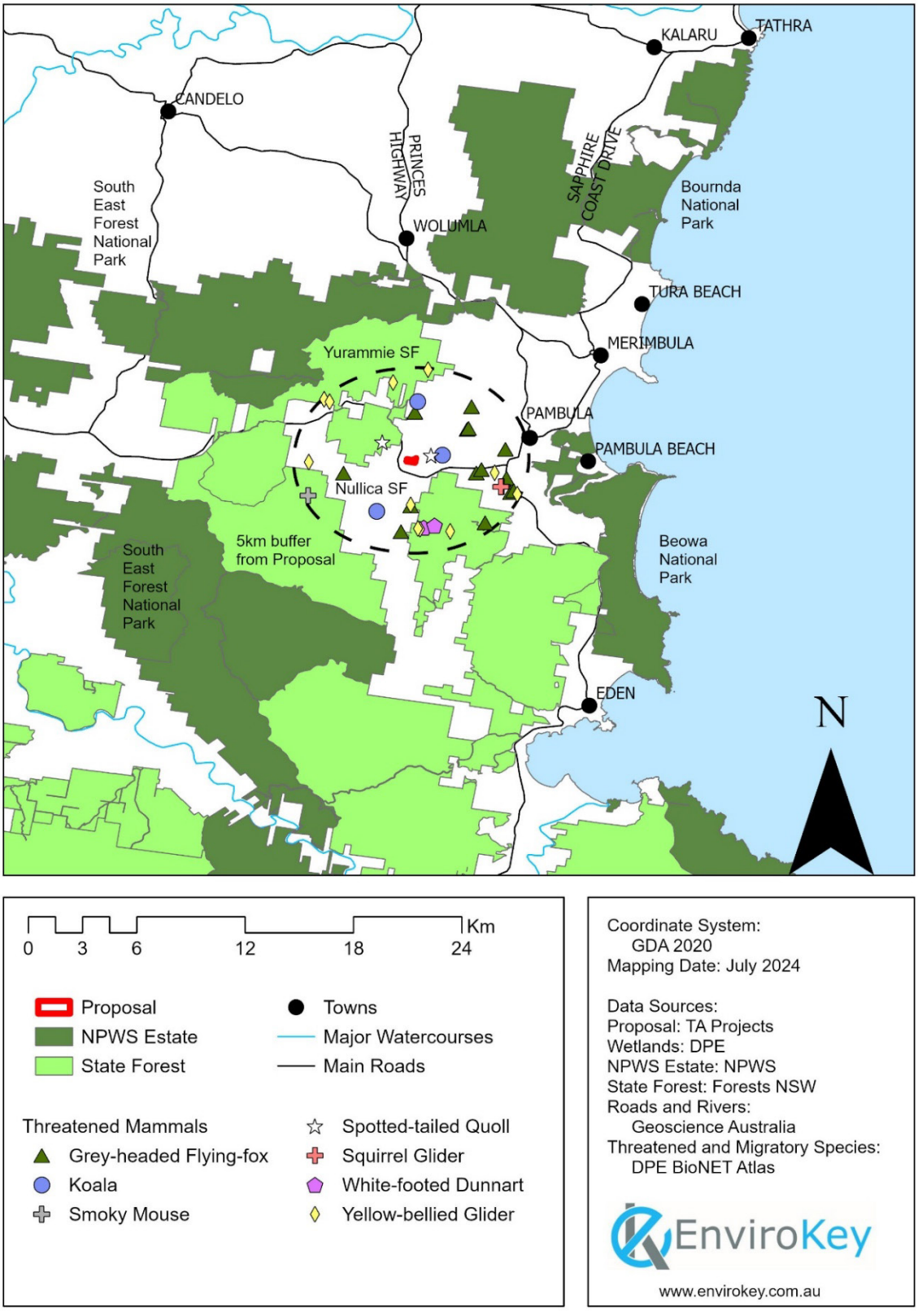


Figure 5-1: Existing threatened mammal records in the locality surrounding the study area

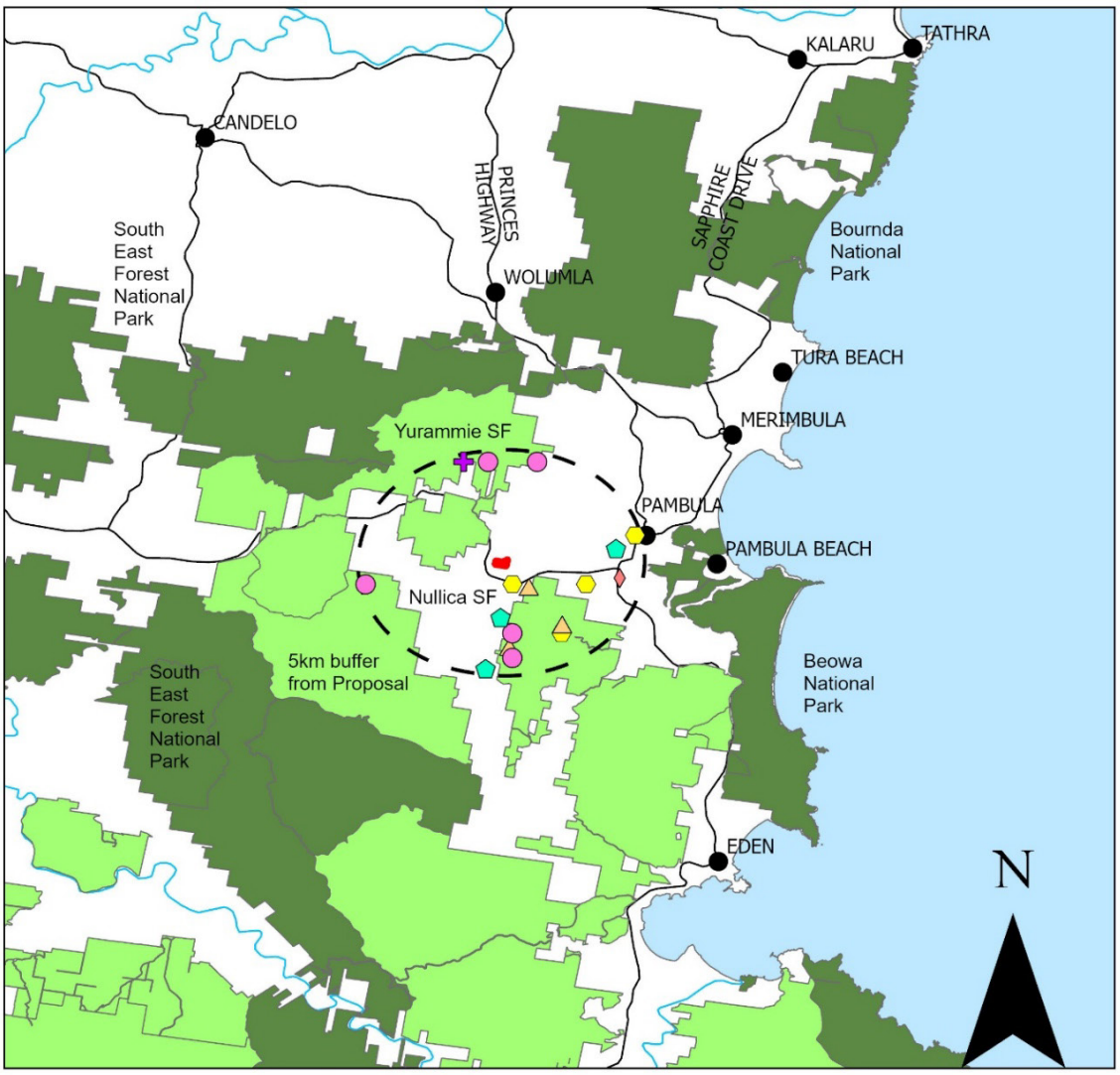

KALARU
TATHRA
CANDELO
PRINCES HIGHWAY
SAPPHIRE COAST DRIVE
South East Forest National Park
WOLUMLA
Bournda National Park
TURA BEACH
MERIMBULA
Yurammie SF
PAMBULA
PAMBULA BEACH
Nullica SF
5km buffer from Proposal
South East Forest National Park
Beowa National Park
EDEN
N
0 3 6 12 18 24 Km
Proposal
NPWS Estate
State Forest
Towns
Major Watercourses
Main Roads
Threatened Birds
Dusky Woodswallow
Gang-gang Cockatoo
Scarlet Robin
Sooty Owl
South-eastern Glossy Black-Cockatoo
White-bellied Sea-Eagle
Coordinate System:
GDA 2020
Mapping Date: July 2024
Data Sources:
Proposal: TA Projects
Wetlands: DPE
NPWS Estate: NPWS
State Forest: Forests NSW
Roads and Rivers:
Geoscience Australia
Threatened and Migratory Species:
DPE BioNET Atlas
EnviroKey
www.envirokey.com.au

Figure 5-2: Existing threatened bird records in the locality surrounding the study area

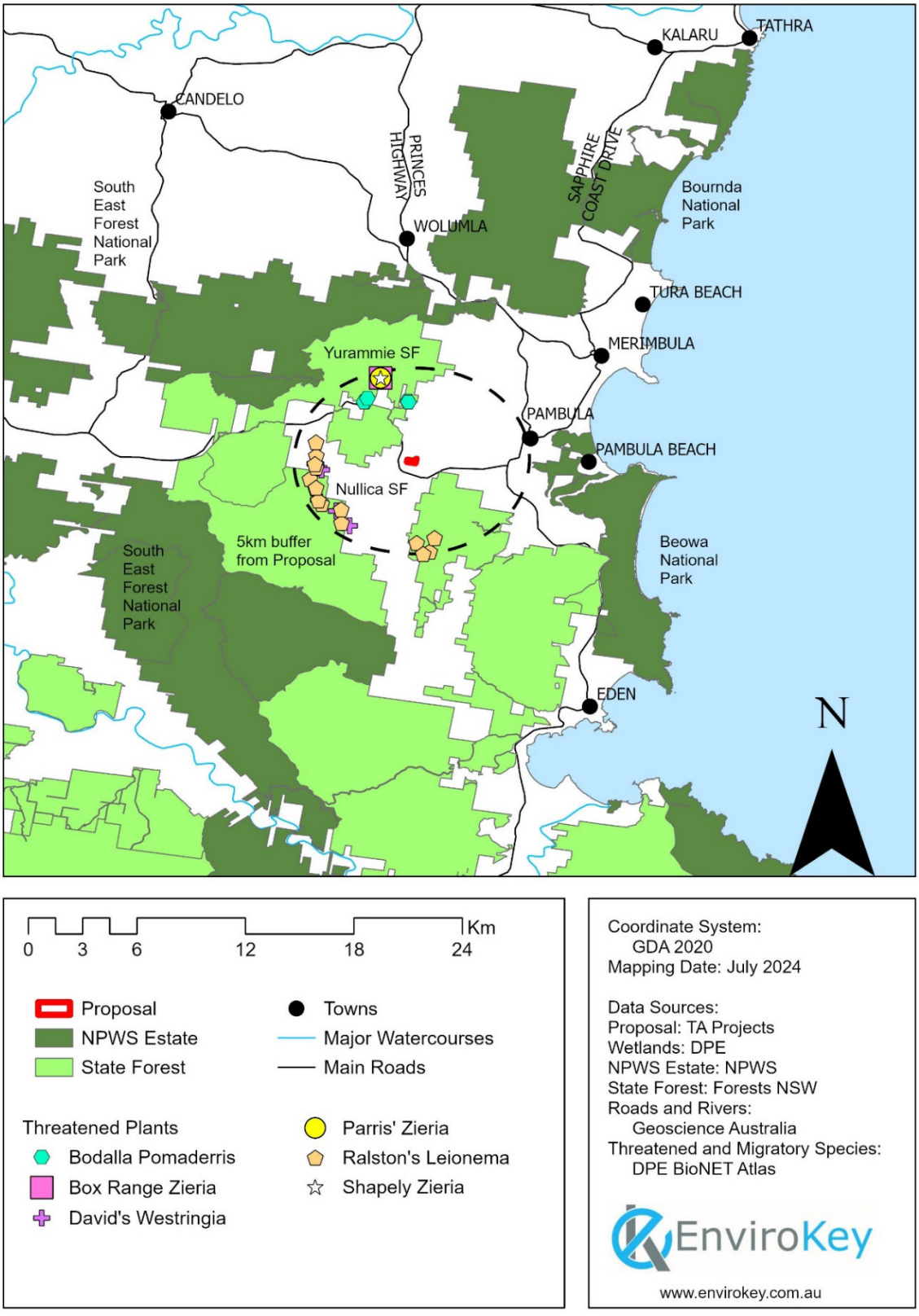


Figure 5-3: Existing threatened plant records in the locality surrounding the study area

6 IDENTIFYING PRESCRIBED IMPACTS

Section 6 of the BAM identifies the prescribed impacts that must be assessed per clause 6.1 of the BC Regulations. **Table 6-1** identifies these prescribed impacts and where they are relevant.

Table 6-1: Prescribed impacts identified

Feature	Present	Description of feature characteristics and location	Threatened entities that use, are likely to use, or are part of the habitat feature. Where relevant, threatened species or fauna that are part of a TEC or EC, that are at risk of vehicle strike
Karst, caves, crevices, cliffs, rocks or other geological features of significance	☐Yes / ☒No	-	n/a
Human-made structures	☐Yes / ☒No	While some human made structures are located within the study area (fences), none are of relevance to threatened biota.	n/a
Non-native vegetation	☒Yes / ☐No	Those portions of the study area mapped as exotic are of virtually no value to threatened species given the VI score of 0.2.	n/a
Habitat connectivity	☒Yes / ☐No	Pambula River crosses the northern portion of the study area, the vegetation corridor along the river provides connectivity to the wider landscape.	No threatened species were recorded during the field survey. However threatened species that may use the habitat within the study area include the Greater Broad-nosed Bat, Spotted Harrier, Square-tailed Kite, Varied Sittella, White-throated Needletail and Yellow-bellied Sheathtail-bat.
Waterbodies, water quality and hydrological processes	☒Yes / ☐No	Pambula River crosses the northern portion of the study area. The study area section of the river is	Australian Grayling adults (including pre spawning and spawning adults) inhabit cool, clear, freshwater streams with gravel substrate and areas alternating

Feature	Present	Description of feature characteristics and location	Threatened entities that use, are likely to use, or are part of the habitat feature. Where relevant, threatened species or fauna that are part of a TEC or EC, that are at risk of vehicle strike
		mapped as containing one Threatened Fish Habitat (Australian Grayling).	between pools and riffle zones. The section of Pambula River within and adjacent to the study area may contain habitat for this threatened species.
Wind turbine strikes (wind farm development only)	☐Yes / ☒No	n/a	n/a
Vehicle strikes	☐Yes / ☒No	n/a	n/a

7 CONCLUSION

This Biodiversity Assessment prepared by **EnviroKey** provides an overview of the study area, the vegetation communities present and threatened species recorded, and will be used to support a Planning Proposal for rezoning of the land to allow the potential for a residential subdivision of the land. This report is not a Biodiversity Development Assessment Report (BDAR) suitable for a development application. It follows Stage 1 of the BAM to allow decision makers to have a detailed understanding of the existing environment within the study area from a biodiversity perspective.

The southern portion of the study area is dominated by exotic grassland, very occasional scattered Blue Box (*Eucalyptus baueriana*) occur within the exotic grassland, indicating that the historical PCT in this area would likely have been PCT 3181 – Bega Wet Shrub Forest. The exotic grassland area is likely to have been derived from the past clearing of this PCT and for the purpose of calculating vegetation integrity scores (VIS), these areas were considered part of that PCT. Other portions of the study area comprise of PCT 3181 in poor-moderate condition, PCT 3192 – South Coast Riverflat Ribbon Gum Forest in moderate condition and PCT 4061 – Bega-Towamba Riparian Scrub in poor-moderate condition. The areas mapped as PCT 3192 have a moderate VIS (43.2), while the other vegetated areas of the study area (exotic grassland) have an extremely low VIS (0.2), confirming they are of virtually no value to biodiversity.

Targeted threatened flora and fauna species surveys were carried out during July 2024, where no threatened species were recorded. The absence of threatened species is not surprising given the highly degraded nature of the majority of the study area

Overall, the study area is of little value to the biodiversity of the Lochiel area. **EnviroKey** recommend that any subdivision design should avoid the riparian area and threatened ecological community which would support the “avoid and minimise” hierarchy as defined by the Biodiversity Offset Scheme.

8 REFERENCES

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9 APPENDICES

Appendix A: Biodiversity Values map and Threshold tool report

Department of Planning and Environment

Biodiversity Values Map and Threshold Report

This report is generated using the Biodiversity Values Map and Threshold (BMAT) tool. The BMAT tool is used by proponents to supply evidence to your local council to determine whether or not a Biodiversity Development Assessment Report (BDAR) is required under the Biodiversity Conservation Regulation 2017 (Cl. 7.2 & 7.3).

The report provides results for the proposed development footprint area identified by the user and displayed within the blue boundary on the map.

There are two pathways for determining whether a BDAR is required for the proposed development:

1. Is there Biodiversity Values Mapping?
2. Is the 'clearing of native vegetation area threshold' exceeded?

Biodiversity Values Map and Threshold Report

Date of Report Generation		30/09/2024 3:31 PM
1. Biodiversity Values (BV) Map - Results Summary (Biodiversity Conservation Regulation Section 7.3)		
1.1	**Does the development Footprint intersect with BV mapping?**	no
1.2	Was ALL BV Mapping within the development footprinted added in the last 90 days? (dark purple mapping only, no light purple mapping present)	no
1.3	**Date of expiry of dark purple 90 day mapping**	N/A
1.4	**Is the Biodiversity Values Map threshold exceeded?**	no
2. Area Clearing Threshold - Results Summary (Biodiversity Conservation Regulation Section 7.2)		
2.1	**Size of the development or clearing footprint**	96,150.3 sqm
2.2	**Native Vegetation Area Clearing Estimate (NVACE)** (within development/clearing footprint)	1,671.4 sqm
2.3	**Method for determining Minimum Lot Size**	LEP
2.4	**Minimum Lot Size** (10,000sqm = 1ha)	1,200,000 sqm
2.5	**Area Clearing Threshold** (10,000sqm = 1ha)	10,000 sqm
2.6	**Does the estimate exceed the Area Clearing Threshold?** (NVACE results are an estimate and can be reviewed using the Guidance)	no

REPORT RESULT: Is the Biodiversity Offset Scheme (BOS) Threshold exceeded for the proposed development footprint area? (Your local council will determine if a BDAR is required)	**no**

What do I do with this report?

• If the result above indicates the BOS Threshold has been exceeded, your local council may require a Biodiversity Development Assessment Report with your development application. Seek further advice from Council. An accredited assessor can apply the Biodiversity Assessment Method and prepare a BDAR for you. For a list of accredited assessors go to: https://customer.lmbc.nsw.gov.au/assessment/AccreditedAssessor.

• If the result above indicates the BOS Threshold has not been exceeded, you may not require a Biodiversity Development Assessment Report. This BMAT report can be provided to Council to support your development application. Council can advise how the area clearing threshold results should be considered. Council will review these results and make a determination if a BDAR is required. Council may ask you to review the area clearing threshold results. You may also be required to assess whether the development is '"likely to significantly affect threatened species" as determined under the test in Section 7.3 of the *Biodiversity Conservation Act 2016*.

• If a BDAR is not required by Council, you may still require a permit to clear vegetation from your local council.

• If all Biodiversity Values mapping within your development footprint was less than 90 days old, i.e. areas are displayed as dark purple on the BV map, a BDAR may not be required if your Development Application is submitted within that 90 day period. Any BV mapping less than 90 days old on this report will expire on the date provided in Line item 1.3 above.

For more detailed advice about actions required, refer to the Interpreting the evaluation report section of the Biodiversity Values Map Threshold Tool User Guide .

Review Options:

• If you believe the Biodiversity Values mapping is incorrect please refer to our BV Map Review webpage for further information.

• If you or Council disagree with the area clearing threshold estimate results from the NVACE in Line Item 2.6 above (i.e. area of Native Vegetation within the Development footprint proposed to be cleared), review the results using the Guide for reviewing area clearing threshold results from the BMAT Tool.

Acknowledgement

I, as the applicant for this development, submit that I have correctly depicted the area that will be impacted or likely to be impacted as a result of the proposed development.

Signature: _____ Date: _____

(Typing your name in the signature field will be considered as your signature for the purposes of this form)

30/09/2024 03:31 PM

Biodiversity Values Map and Threshold Tool

The Biodiversity Values (BV) Map and Threshold Tool identifies land with high biodiversity value, particularly sensitive to impacts from development and clearing.

The BV map forms part of the Biodiversity Offsets Scheme threshold, which is one of the factors for determining whether the Scheme applies to a clearing or development proposal. You have used the Threshold Tool in the map viewer to generate this BV Threshold Report for your nominated area. This report calculates results for your proposed development footprint and indicates whether Council may require you to engage an accredited assessor to prepare a Biodiversity Development Assessment Report (BDAR) for your development.

This report may be used as evidence for development applications submitted to councils. You may also use this report when considering native vegetation clearing under the State Environmental Planning Policy (Biodiversity and Conservation) 2021 - Chapter 2 vegetation in non-rural areas.

What's new? For more information about the latest updates to the Biodiversity Values Map and Threshold Tool go to the updates section on the Biodiversity Values Map webpage.

Map Review: Landholders can request a review of the BV Map where they consider there is an error in the mapping on their property. For more information about the map review process and an application form for a review go to the Biodiversity Values Map Review webpage.

If you need help using this map tool see our Biodiversity Values Map and Threshold Tool User Guide or contact the Map Review Team at map.review@environment.nsw.gov.au or on 1800 001 490.

Biodiversity Values Map

983.7 0 491.83 983.7 Metres

WGS_1984_Web_Mercator_Auxiliary_Sphere

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

Legend

- Biodiversity Values that have been mapped for more than 90 days
- Biodiversity Values added within last 90 days
- Native Vegetation Area Clearing Estimate (NVACE)
- Development area selected by proponent

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The results provided in this tool are generated using the best available mapping and knowledge of species habitat requirements.

This map is valid as at the date the report was generated. Checking the Biodiversity Values Map viewer for mapping updates is recommended.

Appendix B: BAM sheets

EnviroKey

BAM Site – Field Survey Form

Site Sheet no:

Survey Name	Plot Identifier	Recorders
Lot 1+5 Mt Darragh	Lot 1&5 BAM01	James Schlueter

Date	Zone	Datum	IBRA region	Photo #	Zone ID
22/7/24					

Easting	Northing	Dimensions	Orientation of midline from the 0m point
		20 x 50 m	196°

Vegetation Class	Confidence: H M L
Riparian forest	

Plant Community Type	EEC:	Confidence: H M L
PCT 3192		

Record easting and northing from the plot marker. If applicable, orient picket so that perforated rib points along direction of midline. Dimensions (Shape) of 0.04 ha base plot inside 0.1 ha FA plot should be identified, magnetic bearing taken along midline.

BAM Attribute (400 m² plot)		Sum values
Count of **Native Richness**	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of **Cover** of native vascular plants by growth from group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (20 x 50 m plot)		# Tree Stems Count		
dbh		Euc*	Non Euc (Acacia floribunda)	Hollows† not counted
Large trees for Euc* & Non Euc	**80 + cm**	0	0	0
	50 – 79 cm	0	0	0
	30 – 49 cm	5	0	0
	20 – 29 cm	1	0	0
	10 – 19 cm	0	0	0
	5 – 9 cm	0	0	n/a
	< 5 cm	0	0	n/a
Length of logs (m) (≥10cm diameter, >50cm in length)		19+2+4+14+38+4+14+27+16 * Much of these flood transported		total 143

Record number of living eucalypt* (Euc*) and living native non-eucalypt (Non Euc) stems separately

*includes all species of *Eucalyptus*, *Corymbia*, *Angophora*, *Lophostemon* and *Syncarpia*

†Record total number of stems by size class with hollows (including dead stems/trees)

Counts must apply to each size class when the number of living tree stems within the size class is ≤ 10. Estimates can be used when the number of living tree stems within a class is > 10. Estimates should draw from the number series: 10, 20, 30…, 100, 200, 300

For a multi stemmed tree, only the largest living stem is included in the count/estimate. For hollows count only the presence of a stem containing hollows, not count the hollows in that stem. Only count as 1 stem per tree when the tree is multi-stemmed. The hollow-bearing stem may be a dead stem.

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	60	35	70	15	70	0	1	0	2	0	0	0	0	0	0	4	3	4	80	1
Average of the 5 subplots																				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots located on alternate sides and 5 m from the plot midline at the locations 5, 15, 25, 35, and 45m along the midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10cm in diameter). Within these 1 m x 1 m plots assessors may also record the cover of rock, bare ground and cryptogam soil crusts. Collection of these data is optional – the data do not currently contribute to assessment scores, they hold potential value for future vegetation integrity assessment attributes and benchmarks, and for enhancing PCT description.

Physiography + safe features that may help in determining PCT and Management Zone (optional)

Morphological Type	Creek flat	Landform Element	Flat	Landform Patter		Height of tallest veg	20m
Lithology	Mixed sedimentary	Soil Surface Texture	Sandy	Soil Colour		Height of shrub layer	8m
Slope	0°	Aspect	—	Site Drainage		Height of ground layer	1m

Plot Disturbance	Severity Code	Age Code	Observational evidence
Clearing (inc. logging)	2	O	Probably historically cleared - younger stems
Cultivation (inc. pasture)	—		
Soil erosion	2	NR	
Firewood/CWD removal	—		
Grazing (identify native/stock)	—		
Fire damage	—		
Storm damage	2	R	Flooding
Weediness	1	NR	
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

EnviroKey

400 m² plot: Sheet 1 of 3	Survey Name	Plot Identifier	Recorders
Date 22/7/24	Mt Barrow Rd	Lot 185 BAM01	James Schluter

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species. Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
	Enc. viminalis		8	2	U	
	Acacia floribunda		12	50	M	
	Melaleuca armillaris armillaris		3	10		
	Leptospermum ~~emarginatel~~ emarginatum		0.5	#5		1-5
	Kunzea ericoides		0.3	1		
	Melicytus dentata		0.2	1		
	Melaleuca ~~ericifolia~~ parvistaminea		0.2	1		
	Kunzea ambigua		0.2	1		
	Pomaderris aspera		0.1	1		
	Senecio linearifolius		0.2	20		
	Sigesbeckia orie orne		0.5	100		
	~~Hackelia latifolia~~					
	Zantedeschia aethiopica		0.1	2		
	~~'Cape Ivy'~~ Delairea odorata		0.1	4		
	Tradescantia fluminensis		0.1	10		
	Stellaria flaccida		0.2	50		
	Hackelia latifolia		0.3	100		
	Lobelia purpurascens		0.1	2		
	Ranunculus inundatus		0.3	500		
	Ranunculus ~~sp.~~ repens		0.1	10		1-1
	Viola hederacea		0.1	4		
	Lysimachia arvensis		0.2	50		
	~~'Aquatic Plant'~~ Callichtriche muelleri		0.1	5		1-2
	Ehrharta erecta		0.3	100		
	Microlaena stip stip.		0.3	500		
	~~'Aquatic Plant'~~ Isachne globosa		3	500		1-4
	Plectranthus parviflorus		0.1	7		
	Rubus fruticosus sp. agg.		0.1	1		
	Oplismenus imbecillis		0.1	10		
	Tagetes minuta		0.2	20		
	'Veronica ~~'Aquatic'~~' anagallis-aquatica		0.1	1		1-3
	Crassula ~~sp.~~ peruviana		0.1	1		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.
Cover: 0.1, 0.2, 0.3, …, 1, 2, 3, …, 10, 15, 20, 25, …100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*
Abundance: 1, 2, 3, …, 10, 20, 30, … 100, 200, …, 1000, …

400 m² plot: Sheet 2 of 3	Survey Name	Plot Identifier	Recorders
Date 22/7/24	Lot 1 + 5 Mt Darragh Rd	Lot 185 BAM02	James Schluter

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species. Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
	~~Eleocharis 'big'~~ Schoenoplectus validus		0.1	5		1-7
	Juncus ~~australis~~ continuous		0.3	50		1-8
	Persicaria decipiens		0.2	8		
	~~Carex 'broad, floaty'~~ Bolboschoenus sp.		0.1	5		1-14
	Plantago lanceolata		0.1	20		
	Solanum pseudocapsicum		0.1	2		
	Senecio madagascariensis		0.1	10		
	Acetosa sagittata		0.2	50		
	Galium aparine		0.1	10		
	~~Convolvulaceae~~ Calystegia marginata		0.1	5		1-9
	Physalis peruviana		0.1	3		
	Modiola caroliniana		0.1	5		
	Dactylis glomerata		0.2	20		
	Conchus clandestinus		~~0~~ 15	1000		
	Fumaria ~~sp.~~ muralis		0.1	1		1-10
	Agrostis capillaris		0.3	500		
	Conyza sp.		0.3	500		
	~~Fragr~~ Polycarpon tetraphyllum		0.1	10		
	~~'Feny aquatic'~~ Myriophyllum aquaticum		0.3	500		1-11
	~~'pp leaf aquatic~~ Crassula helmsii		0.1	50		1-12
	Hydrocotyle ~~sib thorpioides~~ acutiloba		0.1	20		
	Rumex conglomeratus		0.1	5		
	~~'Heart leaf'~~ Viola odorata		0.1	3		1-13
	Lomandra longifolia		0.3	20		
	Rubus parviflorus		0.1	6		
	Entolasia marginata		0.1	5		
	Carex ~~?~~ longebrachiata	25	~~0~~ ~~0~~	1000		1-15
	Solanum nigrum		0.1	2		
	Gamochaeta sp.		0.1	5		
	Lythrum ~~hyssopifolius~~ hyssopifolium		0.1	1		1-16
	~~Oxalis sp.~~					
	Setaria parviflora		0.1	10		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.
Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ... 100% (foliage cover); ***Note:** 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*
Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

Outside plot: Prostanthera incisa,

400 m² plot: Sheet 3 of 3	Survey Name	Plot Identifier	Recorders
Date 22/7/24	Lot 1+5 Mt Barragh Rd	Lot 1+5 BAM031	James Schluter

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species. Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
	Oxalis sp.		0.1	5		
	Persicaria ~~decipiens~~ praetermissa		0.4	100		1-17
	~~Brassicaceae~~ Rorippa nasturtium-aquaticum		0.2	50		1-18
	Cirsium vulgare		0.2	50		
	Araujia sericifera		0.1	2		
	Phytolacca octandra		0.1	1		
	Parietaria debilis		0.1	3		
	~~Euphorbiaceae~~ Sicyos australis		0.2	20		1-19
	Lotus ~~subbiflorus~~ uliginosus		0.1	8		
	Vesicaria plebia		0.1	2		
	Cyclospermum leptophyllum		0.1	3		
	Sonchus asper		0.2	20		
	Cerastium glomeratum		0.1	6		
	Hydrocotyle bipartita		0.1	5		
	Wahlenbergia gracilis		0.1	2		
	Passiflora edulis		0.1	1		
	Typha orientalis		0.1	2		
	Verbena bonariensis		0.1	2		
	Leontodon saxatilis		0.1	5		
	Poa lab. lab.		0.1	1		
	Cyperus eragrostis		0.1	2		
	Trifolium repens		0.1	20		
	Axonopus fissifolius		0.1	10		
	~~Hollow Cyperaceae~~ Isolepis sp.		0.3	500		1-20

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.
Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*
Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

Outside plot: Sonchus plumosa, Solanum pseudocapsicum

EnviroKey

BAM Site – Field Survey Form

Site Sheet no:

Survey Name	Plot Identifier	Recorders
Lot 1+5 Mt Ogarrah Road	Lot 1+5 BAM02	James Schluter

Date	Zone	Datum	Easting	Northing	IBRA region	Photo #	Zone ID
22/7/24							

Dimensions: 20x50m

Orientation of midline from the 0m point: 170°

Vegetation Class: Confidence: H M L

Plant Community Type: PCT 3181 - DNG - moderate EEC: Confidence: H M L

Record easting and northing from the plot marker. If applicable, orient picket so that perforated rib points along direction of midline. Dimensions (Shape) of 0.04 ha base plot inside 0.1 ha FA plot should be identified, magnetic bearing taken along midline.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth from group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (20 x 50 m plot)	# Tree Stems Count		
dbh	Euc*	Non Euc	Hollows†
Large trees for Euc* & Non Euc: 80 + cm	0	0	0
50 – 79 cm	0	0	0
30 – 49 cm	0	0	0
20 – 29 cm	0	0	0
10 – 19 cm	0	0	0
5 – 9 cm	0	0	n/a
< 5 cm	0	0	n/a
Length of logs (m) (≥10cm diameter, >50cm in length)	0		total 0

Record number of living eucalypt* (Euc*) and living native non-eucalypt (Non Euc) stems separately

*includes all species of *Eucalyptus, Corymbia, Angophora, Lophostemon* and *Syncarpia*

†Record total number of stems by size class with hollows (including dead stems/trees)

Counts must apply to each size class when the number of living tree stems within the size class is ≤ 10. Estimates can be used when the number of living tree stems within a class is > 10. Estimates should draw from the number series: 10, 20, 30…, 100, 200, 300

For a multi stemmed tree, only the largest living stem is included in the count/estimate. For hollows count only the presence of a stem containing hollows, not count the hollows in that stem. Only count as 1 stem per tree when the tree is multi-stemmed. The hollow-bearing stem may be a dead stem.

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	50	65	60	75	70	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Average of the 5 subplots																				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots located on alternate sides and 5 m from the plot midline at the locations 5, 15, 25, 35, and 45m along the midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10cm in diameter). Within these 1 m x 1 m plots assessors may also record the cover of rock, bare ground and cryptogam soil crusts. Collection of these data is optional – the data do not currently contribute to assessment scores, they hold potential value for future vegetation integrity assessment attributes and benchmarks, and for enhancing PCT description.

Physiography + safe features that may help in determining PCT and Management Zone (optional)

Morphological Type	Lower slope	Landform Element		Landform Pattern		Height of tallest veg	–
Lithology	?shale	Soil Surface Texture	Clay loam	Soil Colour	Red-brown	Height of shrub layer	–
Slope	6°	Aspect	290°	Site Drainage	~~Rap~~ mod	Height of ground layer	0.6m

Plot Disturbance	Severity Code	Age Code	Observational evidence
Clearing (inc. logging)	3	O	
Cultivation (inc. pasture)	-		
Soil erosion	-		
Firewood/CWD removal	-		
Grazing (identify native/stock)	2	~~NR~~ R	Sheep
Fire damage	-		
Storm damage	-		
Weediness	-		
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Lower slope above riparian zone. Adjacent to better ground cover + Euc. baueriana, Euc. viminalis + Angophora floribunda canopy ~~at~~ upslope. Grading into exotic-dominated at 0 to SW.

EnviroKey

400 m² plot: Sheet 1 of	Survey Name	Plot Identifier	Recorders
Date 22/7/24	Lot 1 + 5 Mt Barrington	Lot 1+5 BAM02	James Schluter

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species. Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
	Eragrostis leptostachya		40	3000		
	Microlaena stipoides stipoides		35	3000		
	Themeda triandra		0.1	3		
	Cotula australis		0.1	20		
	Rumex brownii		0.2	100		
	Hypochaeris radicata		3	1500		
	Trifolium repens		3	1000		
	Gamochaeta americana		0.5	500		
	Centaurium erythraea		0.1	5		
	Verbascum thapsus thapsus		0.1	6		
	Sporobolus ~~fertilis~~ africanus		2	500		2-1
	Paspalum dilatatum		0.2	50		
	Eragrostis curvula		0.2	20		
	~~Dactylis~~ glomerata Phalaris aquatica		0.2	50		2-2
	Leontodon saxatilis		0.3	500		
	Carex inversa		0.1	3		
	Andropogon virginicus		0.1	1		
	Plantago lanceolata		0.2	100		
	Holcus lanatus		0.2	50		
	Verbena bonariensis		0.1	7		
	Dactylis glomerata		0.4	500		
	Juncus ~~filicaulis~~ ? sp. usitatus		0.1	1		
	Modiola caroliniana		0.1	3		
	Wahlenbergia gracilis		0.1	1		
	Pteridium esculentum		0.2	50		
	Axonopus fissifolius		0.1	1		
	Parosynchia brasiliana		0.1	1		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.
Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*
Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

EnviroKey

BAM Site – Field Survey Form

Site Sheet no:

Survey Name	Plot Identifier	Recorders
Lot 1+5 Mt Darragh Rd	Lot 1+5 BAM03	James Schluter

Date	Zone	Datum	Easting	Northing	IBRA region	Photo #	Zone ID	Dimensions	Orientation of midline from the 0m point
22/7/24							5	20x50m	5°

Vegetation Class		Confidence: H M L
Plant Community Type	PCT 3181 - Scatted trees, exotic ground	EEC: / Confidence: H M L

Record easting and northing from the plot marker. If applicable, orient picket so that perforated rib points along direction of midline. Dimensions (Shape) of 0.04 ha base plot inside 0.1 ha FA plot should be identified, magnetic bearing taken along midline.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth from group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (20 x 50 m plot)		# Tree Stems Count		
dbh		Euc*	Non Euc	Hollows†
Large trees for Euc* & Non Euc	80 + cm	I	0	
	50 – 79 cm	IIII 4	0	
	30 – 49 cm	HHT II 6	0	
	20 – 29 cm	IIII 4	0	
	10 – 19 cm	0	0	
	5 – 9 cm	0	0	n/a
	< 5 cm	0	0	n/a
Length of logs (m) (≥10cm diameter, >50cm in length)		5+2+3+7+7		total 24m

Record number of living eucalypt* (Euc*) and living native non-eucalypt (Non Euc) stems separately

*includes all species of *Eucalyptus*, *Corymbia*, *Angophora*, *Lophostemon* and *Syncarpia*

†Record total number of stems by size class with hollows (including dead stems/trees)

Counts must apply to each size class when the number of living tree stems within the size class is ≤ 10. Estimates can be used when the number of living tree stems within a class is > 10. Estimates should draw from the number series: 10, 20, 30…, 100, 200, 300

For a multi stemmed tree, only the largest living stem is included in the count/estimate. For hollows count only the presence of a stem containing hollows, not count the hollows in that stem. Only count as 1 stem per tree when the tree is multi-stemmed. The hollow-bearing stem may be a dead stem.

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	25	80	90	70	90	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Average of the 5 subplots																				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots located on alternate sides and 5 m from the plot midline at the locations 5, 15, 25, 35, and 45m along the midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10cm in diameter). Within these 1 m x 1 m plots assessors may also record the cover of rock, bare ground and cryptogam soil crusts. Collection of these data is optional – the data do not currently contribute to assessment scores, they hold potential value for future vegetation integrity assessment attributes and benchmarks, and for enhancing PCT description.

Physiography + safe features that may help in determining PCT and Management Zone (optional)

Morphological Type	Midslope	Landform Element	hillslope	Landform Patter		Height of tallest veg	18m
Lithology	?	Soil Surface Texture	Clay-loam	Soil Colour	Brown	Height of shrub layer	N/A
Slope	7°	Aspect	5°	Site Drainage		Height of ground layer	0.35m

Plot Disturbance	Severity Code	Age Code	Observational evidence
Clearing (inc. logging)	2	NR	
Cultivation (inc. pasture)	3	O	
Soil erosion	–		
Firewood/CWD removal	2	NR	Cut logs present
Grazing (identify native/stock)	3	R	Sheep crap - sheep dung very high cover
Fire damage	–		
Storm damage	–		
Weediness	–		
Other	–		

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

EnviroKey

400 m² plot: Sheet 1 of 1	Survey Name	Plot Identifier	Recorders
Date 22/7/24	Lot 1+5 Mt Darragh Rd	lot1+5BAM03	James Schlunke

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species. Full species name where practicable	N, E or HTE	Cover 45	Abund	stratum	voucher
	Enc. baueriana			6		
	Cenchrus clandestina		70	1000		
	Ehrharta erecta		3	1000		
	Stellaria media		0.3	1000		
	Dactylis glomerata		0.1	10		
	Rumex brownii		0.1	10		
	Conyza sp.		0.1	5		
	Sonchus asper		0.1	10		
	Sonchus oleraceus		0.1	8		
	Einadia nutans		0.1	1		
	Cirsium vulgare		0.1	3		
	Phalaris aquatica		0.1	4		
	Urtica dioica		0.1	7		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.
Cover: 0.1, 0.2, 0.3, …, 1, 2, 3, …, 10, 15, 20, 25, …100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*
Abundance: 1, 2, 3, …, 10, 20, 30, … 100, 200, …, 1000, …

BAM Site – Field Survey Form

Site Sheet no:

Survey Name	Plot Identifier	Recorders
Lot 1+5 Mt Darragh	Lot1+5BAM04	James Schluter

Date	Zone	Datum	IBRA region	Photo #	Zone ID
22/7/24					

Easting	Northing	Dimensions	Orientation of midline from the 0m point
		20 x 50m	30°

Vegetation Class		Confidence: H M L
Plant Community Type	Exotic grassland	EEC: / Confidence: H M L

Record easting and northing from the plot marker. If applicable, orient picket so that perforated rib points along direction of midline. Dimensions (Shape) of 0.04 ha base plot inside 0.1 ha FA plot should be identified, magnetic bearing taken along midline.

BAM Attribute (400 m² plot)		Sum values
Count of **Native Richness**	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of **Cover** of native vascular plants by growth from group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (20 x 50 m plot)	# Tree Stems Count			
dbh	Euc*	Non Euc	Hollows†	Record number of living eucalypt* (Euc*) and living native non-eucalypt (Non Euc) stems separately
Large trees for Euc* & Non Euc — **80 + cm**	0	0	0	*includes all species of *Eucalyptus, Corymbia, Angophora, Lophostemon* and *Syncarpia*
50 – 79 cm	0	0	0	
30 – 49 cm	0	0	0	†Record total number of stems by size class with hollows (including dead stems/trees)
20 – 29 cm	0	0	0	
10 – 19 cm	0	0	0	
5 – 9 cm	0	0	n/a	
< 5 cm	0	0	n/a	
Length of logs (m) (≥10cm diameter, >50cm in length)	0			total 0

Counts must apply to each size class when the number of living tree stems within the size class is ≤ 10. Estimates can be used when the number of living tree stems within a class is > 10. Estimates should draw from the number series: 10, 20, 30..., 100, 200, 300

For a multi stemmed tree, only the largest living stem is included in the count/estimate. For hollows count only the presence of a stem containing hollows, not count the hollows in that stem. Only count as 1 stem per tree when the tree is multi-stemmed. The hollow-bearing stem may be a dead stem.

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	65	50	65	80	70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Average of the 5 subplots																				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots located on alternate sides and 5 m from the plot midline at the locations 5, 15, 25, 35, and 45m along the midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10cm in diameter). Within these 1 m x 1 m plots assessors may also record the cover of rock, bare ground and cryptogam soil crusts. Collection of these data is optional – the data do not currently contribute to assessment scores, they hold potential value for future vegetation integrity assessment attributes and benchmarks, and for enhancing PCT description.

Physiography + safe features that may help in determining PCT and Management Zone (optional)

Morphological Type	Midslope	Landform Element		Landform Pattern	Hillslope	Height of tallest veg	–
Lithology	? shale	Soil Surface Texture	Clay loam	Soil Colour	Brown	Height of shrub layer	–
Slope	6°	Aspect	10°	Site Drainage	[illegible]	Height of ground layer	0.3m

Plot Disturbance	Severity Code	Age Code	Observational evidence
Clearing (inc. logging)	3	O	
Cultivation (inc. pasture)	3	O	
Soil erosion	–		
Firewood/CWD removal	–		
Grazing (identify native/stock)	3	R	
Fire damage	–		
Storm damage	–		
Weediness	3	O	
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet 1 of 1		Survey Name	Plot Identifier	Recorders
Date	22/7/24	Lot 1+5 Mt Barrow Rd	Lot 1+5 BAM04	James Schlunke

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species. Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
	Cenchrus clandestinus		90	1000		
	Dactylis glomerata		2	500		
	Trifolium repens		1	500		
	Paspalum dilatatum		0.1	5		
	Holcus lanatus		3	100		
	Hypochaeris radicata		0.1	8		
	Conium maculatum		0.1	1		
	Sonchus asper		0.1	3		
	Phalaris aquatica		0.2	50		2-7
	Ceranium sol. sol.		0.1	1		
	Microlaena stip. stip.		0.1	6		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.
Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*
Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

BAM Site – Field Survey Form

Site Sheet no:

Survey Name	Plot Identifier	Recorders
	Lot 1+5 BAM 05	James Schluter

Date	Zone	Datum	Easting	Northing
22/7/24				

IBRA region		Photo #		Zone ID	

Dimensions	20 x 50	Orientation of midline from the 0m point	115°

Vegetation Class		Confidence: H M L
Plant Community Type	Exotic grasslands	EEC: / Confidence: H M L

Record easting and northing from the plot marker. If applicable, orient picket so that perforated rib points along direction of midline. Dimensions (Shape) of 0.04 ha base plot inside 0.1 ha FA plot should be identified, magnetic bearing taken along midline.

BAM Attribute (400 m² plot)		Sum values
Count of **Native Richness**	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of **Cover** of native vascular plants by growth from group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (20 x 50 m plot)		# Tree Stems Count		
dbh		Euc*	Non Euc	Hollows†
Large trees for Euc* & Non Euc	**80 + cm**	0	0	0
	50 – 79 cm	0	0	0
30 – 49 cm		0	0	0
20 – 29 cm		0	0	0
10 – 19 cm		0	0	0
5 – 9 cm		0	0	n/a
< 5 cm		0	0	n/a
Length of logs (m) (≥10cm diameter, >50cm in length)		0		total 0

Record number of living eucalypt* (Euc*) and living native non-eucalypt (Non Euc) stems separately

*includes all species of *Eucalyptus, Corymbia, Angophora, Lophostemon* and *Syncarpia*

†Record total number of stems by size class with hollows (including dead stems/trees)

Counts must apply to each size class when the number of living tree stems within the size class is ≤ 10. Estimates can be used when the number of living tree stems within a class is > 10. Estimates should draw from the number series: 10, 20, 30..., 100, 200, 300

For a multi stemmed tree, only the largest living stem is included in the count/estimate. For hollows count only the presence of a stem containing hollows, not count the hollows in that stem. Only count as 1 stem per tree when the tree is multi-stemmed. The hollow-bearing stem may be a dead stem.

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	55	80	90	75	80	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Average of the 5 subplots																				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots located on alternate sides and 5 m from the plot midline at the locations 5, 15, 25, 35, and 45m along the midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10cm in diameter). Within these 1 m x 1 m plots assessors may also record the cover of rock, bare ground and cryptogam soil crusts. Collection of these data is optional – the data do not currently contribute to assessment scores, they hold potential value for future vegetation integrity assessment attributes and benchmarks, and for enhancing PCT description.

Physiography + safe features that may help in determining PCT and Management Zone (optional)

Morphological Type	Lower slope	Landform Element		Landform Pattern	Hillslope	Height of tallest veg	–
Lithology	?	Soil Surface Texture	clay loam	Soil Colour	Brown	Height of shrub layer	–
Slope	3°	Aspect	355°	Site Drainage		Height of ground layer	0-35m

Plot Disturbance	Severity Code	Age Code	Observational evidence
Clearing (inc. logging)	3	O	
Cultivation (inc. pasture)	3	O	
Soil erosion	–		
Firewood/CWD removal	–		
Grazing (identify native/stock)	3	R	
Fire damage	0		
Storm damage	0		
Weediness	3	R	
Other	–		

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet 1 of 1	Survey Name	Plot Identifier	Recorders
Date 22/7/24	Lot 145 Mt Darragh	LOT145BAM05	James Schluter

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species. Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
	Cenchrus clandestinus		90	1000		
	Trifolium repens		3	1000		
	Holcus lanatus		5	1000		
	Dactylis glomerata		0.4	500		
	Paspalum dilatatum		0.1	5		
	Agrostis capillaris		0.2	100		
	Phalaris aquatica		0.2	20		
	Microlaena stip. stip.		0.1	3		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.
Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*
Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

BAM Site – Field Survey Form

Site Sheet no:

Survey Name	Plot Identifier	Recorders
Lot 1+5 Old Dawyalla	Lot1+5 BAM06	James Schluter

Date	Zone	Datum	Easting	Northing
22/7/24				

IBRA region		Photo #		Zone ID	
Dimensions	20x50	Orientation of midline from the 0m point	335°		

Vegetation Class		Confidence: H M L
Plant Community Type	Exotic grasslands	EEC: / Confidence: H M L

Record easting and northing from the plot marker. If applicable, orient picket so that perforated rib points along direction of midline. Dimensions (Shape) of 0.04 ha base plot inside 0.1 ha FA plot should be identified, magnetic bearing taken along midline.

BAM Attribute (400 m² plot)		Sum values
Count of **Native Richness**	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of **Cover** of native vascular plants by growth from group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (20 x 50 m plot)		# Tree Stems Count		
dbh	Euc*	Non Euc	Hollows†	
Large trees for Euc* & Non Euc	**80 + cm**	0	0	0
	50 – 79 cm	0	0	0
	30 – 49 cm	0	0	0
	20 – 29 cm	0	0	0
	10 – 19 cm	0	0	0
	5 – 9 cm	0	0	n/a
	< 5 cm	0	0	n/a
Length of logs (m) (≥10cm diameter, >50cm in length)		0		total 0

Record number of living eucalypt* (Euc*) and living native non-eucalypt (Non Euc) stems separately

*includes all species of *Eucalyptus, Corymbia, Angophora, Lophostemon* and *Syncarpia*

†Record total number of stems by size class with hollows (including dead stems/trees)

Counts must apply to each size class when the number of living tree stems within the size class is ≤ 10. Estimates can be used when the number of living tree stems within a class is > 10. Estimates should draw from the number series: 10, 20, 30..., 100, 200, 300

For a multi stemmed tree, only the largest living stem is included in the count/estimate. For hollows count only the presence of a stem containing hollows, not count the hollows in that stem. Only count as 1 stem per tree when the tree is multi-stemmed. The hollow-bearing stem may be a dead stem.

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	85	80	70	65	65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Average of the 5 subplots																				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots located on alternate sides and 5 m from the plot midline at the locations 5, 15, 25, 35, and 45m along the midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10cm in diameter). Within these 1 m x 1 m plots assessors may also record the cover of rock, bare ground and cryptogam soil crusts. Collection of these data is optional – the data do not currently contribute to assessment scores, they hold potential value for future vegetation integrity assessment attributes and benchmarks, and for enhancing PCT description.

Physiography + safe features that may help in determining PCT and Management Zone (optional)

Morphological Type	Midslope	Landform Element		Landform Pattern	Hillslope	Height of tallest veg	–
Lithology	?	Soil Surface Texture	Clay loam	Soil Colour	Brown	Height of shrub layer	–
Slope	3°	Aspect	320°	Site Drainage		Height of ground layer	0.35m

Plot Disturbance	Severity Code	Age Code	Observational evidence
Clearing (inc. logging)	3	O	
Cultivation (inc. pasture)	3	O	
Soil erosion	–		
Firewood/CWD removal	–		
Grazing (identify native/stock)	3	R	
Fire damage	–		
Storm damage	–		
Weediness	3	R	
Other	–	–	

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet 1 of 1		Survey Name	Plot Identifier	Recorders
Date	22/7/24	Lot 1+5 Mt Darragh Rd	Lot 1+5 BAM06	James Schlunke

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species. Full species name where practicable	N, E or HTE	Cover 70	Abund	stratum	voucher
	Cenchrus clandestinus		80	1000		
	Holcus lanatus		20	3000		
	Trifolium repens		2	500		
	microlaena stip. stip.		0.1	5		
	Rumex brownii		0.1	1		
	Phalaris aquatica		4	500		2-2
	Dactylis glomeratus		0.3	50		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.
Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*
Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

BAM Site – Field Survey Form

Site Sheet no:

Survey Name	Plot Identifier	Recorders
Lot 1+5 Mt Pangkhat	Lot1+5BAM07	James Schluter

Date	Zone	Datum	IBRA region		Photo #		Zone ID	
23/7/24								

Easting	Northing	Dimensions	Orientation of midline from the 0m point
		20 x 50	100°

Vegetation Class		Confidence: H M L
Plant Community Type	PCT 3181 - DNG Poor	EEC: / Confidence: H M L

Record easting and northing from the plot marker. If applicable, orient picket so that perforated rib points along direction of midline. Dimensions (Shape) of 0.04 ha base plot inside 0.1 ha FA plot should be identified, magnetic bearing taken along midline.

BAM Attribute (400 m² plot)		Sum values
Count of **Native Richness**	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of **Cover** of native vascular plants by growth from group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (20 x 50 m plot)	Euc*	Non Euc	Hollows†
dbh	# Tree Stems Count		
Large trees for Euc* & Non Euc — **80 + cm**	0	0	0
50 – 79 cm	0	0	0
30 – 49 cm	0	0	0
20 – 29 cm	0	0	0
10 – 19 cm	0	0	0
5 – 9 cm	0	0	n/a
< 5 cm	0	0	n/a
Length of logs (m) (≥10cm diameter, >50cm in length)	0		total: 0

Record number of living eucalypt* (Euc*) and living native non-eucalypt (Non Euc) stems separately

*includes all species of *Eucalyptus, Corymbia, Angophora, Lophostemon* and *Syncarpia*

†Record total number of stems by size class with hollows (including dead stems/trees)

Counts must apply to each size class when the number of living tree stems within the size class is ≤ 10. Estimates can be used when the number of living tree stems within a class is > 10. Estimates should draw from the number series: 10, 20, 30..., 100, 200, 300

For a multi stemmed tree, only the largest living stem is included in the count/estimate. For hollows count only the presence of a stem containing hollows, not count the hollows in that stem. Only count as 1 stem per tree when the tree is multi-stemmed. The hollow-bearing stem may be a dead stem.

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	90	80	90	95	85	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Average of the 5 subplots																				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots located on alternate sides and 5 m from the plot midline at the locations 5, 15, 25, 35, and 45m along the midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10cm in diameter). Within these 1 m x 1 m plots assessors may also record the cover of rock, bare ground and cryptogam soil crusts. Collection of these data is optional – the data do not currently contribute to assessment scores, they hold potential value for future vegetation integrity assessment attributes and benchmarks, and for enhancing PCT description.

Physiography + safe features that may help in determining PCT and Management Zone (optional)

Morphological Type	Flat	Landform Element		Landform Pattern	River Flat	Height of tallest veg	—
Lithology	? Alluvial	Soil Surface Texture	Loamy clay	Soil Colour	Brown	Height of shrub layer	—
Slope	0°	Aspect	—	Site Drainage	Slow	Height of ground layer	0.3m

Plot Disturbance	Severity Code	Age Code	Observational evidence
Clearing (inc. logging)	3	O	
Cultivation (inc. pasture)	3	O	
Soil erosion	—		
Firewood/CWD removal	—		
Grazing (identify native/stock)	3	R	
Fire damage	—		
Storm damage	—		
Weediness	2	R	
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

On low bench just above riparian zone. Historical floodplain.

400 m² plot: Sheet 1 of 1	Survey Name	Plot Identifier	Recorders
Date 23/7/24	Lot 145 MT Darragh	Lot 145 BAM07	James Schluehe

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species. Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
	Carduus clavidentus		35	1000		
	Microlaena stip. stipo		40	5000		
	Holcus lanatus		20	3000		
	Trifolium repens		0.2	500		
	Dactylis glomerata		0.2	100		
	Stellaria media		0.1	3		
	Paspalum dilatatum		0.2	100		
	Hypochaeris ~~radicata~~ glabra		0.1	20		
	Rumex brownii		0.1	2		
	Cirsium vulgare		0.2	20		
	Sonchus asper		0.1	8		
	Conium maculatum		0.1	4		
	Phalaris aquatica		0.2	20		2-2
	Carex ~~appressa~~ large bracteate		0.1	1		
	Oxalis perennans		0.1	1		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code if 'top 3'.**
Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*
Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

BAM Site – Field Survey Form

Site Sheet no:

Survey Name	Plot Identifier	Recorders
Lot 145 Mt Darragh R	Lot 145 BAM08	James Schluter

Date	Zone	Datum	Easting	Northing	IBRA region	Photo #	Zone ID
23/7/24							

Dimensions	Orientation of midline from the 0m point
20 x 50	90°

Vegetation Class		Confidence: H M L
Plant Community Type	PCT 4061	EEC: / Confidence: H M L

Record easting and northing from the plot marker. If applicable, orient picket so that perforated rib points along direction of midline. Dimensions (Shape) of 0.04 ha base plot inside 0.1 ha FA plot should be identified, magnetic bearing taken along midline.

BAM Attribute (400 m² plot)		Sum values
Count of **Native Richness**	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of **Cover** of native vascular plants by growth from group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (20 x 50 m plot)	# Tree Stems Count			
dbh		Euc*	Non Euc	Hollows†
Large trees for Euc* & Non Euc	**80 + cm**	0	0	0
	50 – 79 cm	0	0	0
	30 – 49 cm	0	0	0
	20 – 29 cm	0	0	0
	10 – 19 cm	0	0	0
	5 – 9 cm	0	0	n/a
	< 5 cm	0	0	n/a
Length of logs (m) (≥10cm diameter, >50cm in length)			0	total 0

Record number of living eucalypt* (Euc*) and living native non-eucalypt (Non Euc) stems separately

*includes all species of *Eucalyptus, Corymbia, Angophora, Lophostemon* and *Syncarpia*

†Record total number of stems by size class with hollows (including dead stems/trees)

Counts must apply to each size class when the number of living tree stems within the size class is ≤ 10. Estimates can be used when the number of living tree stems within a class is > 10. Estimates should draw from the number series: 10, 20, 30…, 100, 200, 300

For a multi stemmed tree, only the largest living stem is included in the count/estimate. For hollows count only the presence of a stem containing hollows, not count the hollows in that stem. Only count as 1 stem per tree when the tree is multi-stemmed. The hollow-bearing stem may be a dead stem.

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	15	55	65	80	75	3	0	0	0	0	0	0	0	0	0	20	0	0	0	0
Average of the 5 subplots																				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots located on alternate sides and 5 m from the plot midline at the locations 5, 15, 25, 35, and 45m along the midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10cm in diameter). Within these 1 m x 1 m plots assessors may also record the cover of rock, bare ground and cryptogam soil crusts. Collection of these data is optional – the data do not currently contribute to assessment scores, they hold potential value for future vegetation integrity assessment attributes and benchmarks, and for enhancing PCT description.

Physiography + safe features that may help in determining PCT and Management Zone (optional)

Morphological Type	Flat	Landform Element	Stream	Landform Pattern	River flat	Height of tallest veg	–
Lithology	Mixed	Soil Surface Texture	Gravel	Soil Colour		Height of shrub layer	2.5m
Slope	0	Aspect	–	Site Drainage		Height of ground layer	0.8m

Plot Disturbance	Severity Code	Age Code	Observational evidence
Clearing (inc. logging)	3	O	
Cultivation (inc. pasture)	–		
Soil erosion	1	NR	
Firewood/CWD removal	–		
Grazing (identify native/stock)	1	R	Stock - sheep. Occasional
Fire damage	–		
Storm damage	1		
Weediness	–		
Other	–		

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet 1 of 1	Survey Name	Plot Identifier	Recorders
Date 23/7/24	Lot 1+5 RAT Darraghs	Lot 1+5 BAM08	James Schluter

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species. Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
	Melaleuca armillaris / annulata		0.3	4		
	Melaleuca ~~lanceolata~~ / parvistaminea		0.2	2		
	Typha orientalis		0.8	50		
Aquatic Plants	Isachne globosa		15	1000		1-4
	Carex Plongebrachiata		60	3000		1-15
	Juncus ~~pallidus~~ continuus		0.2	20		1-8
	Persicaria decipiens		0.1	5		
	Cenchrus clandestinus		8	1000		
	Hydrocotyle ~~sibthorpioides~~ acutiloba		0.1	50		
	~~Agrostis capillaris~~					
	Cynodon dactylon		0.2	100		
	Rumex conglomeratus		0.2	100		
	Hypochaeris glabra		0.1	5		
	Sonchus asper		0.1	8		
	Persicaria ~~'Creeping'~~ praetermissa		0.1	10		1-17
	Holcus lanatus		0.2	50		
	Trifolium repens		0.1	20		
	Sporobolus sp. ? ~~test~~ africanus		0.1	1		2-1
	Modiola caroliniana		0.1	2		
	~~Tall Rush septate sedge~~ Schoenoplectus validus		0.3	50		8-1
	Ranunculus inundatus		0.1	20		
	Juncus ~~bracteat~~ bulbosus		0.1	5		8-2
	Paspalum dilatatum		0.1	2		
	Lysimachia arvensis		0.1	2		
	Lotus ~~glaber~~ uliginosus		0.1	4		
	Plantago lanceolata		0.1	1		
	Conium maculatum		0.1	1		
	Cramochaeta sp.		0.1	2		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.
Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*
Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

BAM Site – Field Survey Form

Site Sheet no:

Survey Name	Plot Identifier	Recorders
Lot 145 Mt Darragh Rd	Lot 145 BAM09	James Schluter

Date	Zone	Datum	IBRA region		Photo #		Zone ID	
23/7/24								

Easting	Northing	Dimensions	Orientation of midline from the 0m point
		20 x 50	190°

Vegetation Class		Confidence: H M L
Plant Community Type	PCT 3181 – DNG Pool	EEC: / Confidence: H M L

Record easting and northing from the plot marker. If applicable, orient picket so that perforated rib points along direction of midline. Dimensions (Shape) of 0.04 ha base plot inside 0.1 ha FA plot should be identified, magnetic bearing taken along midline.

BAM Attribute (400 m² plot)		Sum values
Count of **Native Richness**	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of **Cover** of native vascular plants by growth from group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (20 x 50 m plot)	Euc*	Non Euc	Hollows†
	# Tree Stems Count		
dbh			
Large trees for Euc* & Non Euc — **80 + cm**	0	0	0
50 – 79 cm	0	0	0
30 – 49 cm	0	0	0
20 – 29 cm	0	0	0
10 – 19 cm	0	0	0
5 – 9 cm	0	0	n/a
< 5 cm	0	0	n/a
Length of logs (m) (≥10cm diameter, >50cm in length)	0		total 0

Record number of living eucalypt* (Euc*) and living native non-eucalypt (Non Euc) stems separately

*includes all species of *Eucalyptus, Corymbia, Angophora, Lophostemon* and *Syncarpia*

†Record total number of stems by size class with hollows (including dead stems/trees)

Counts must apply to each size class when the number of living tree stems within the size class is ≤ 10. Estimates can be used when the number of living tree stems within a class is > 10. Estimates should draw from the number series: 10, 20, 30…, 100, 200, 300

For a multi stemmed tree, only the largest living stem is included in the count/estimate. For hollows count only the presence of a stem containing hollows, not count the hollows in that stem. Only count as 1 stem per tree when the tree is multi-stemmed. The hollow-bearing stem may be a dead stem.

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	70	55	55	75	80	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Average of the 5 subplots																				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots located on alternate sides and 5 m from the plot midline at the locations 5, 15, 25, 35, and 45m along the midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10cm in diameter). Within these 1 m x 1 m plots assessors may also record the cover of rock, bare ground and cryptogam soil crusts. Collection of these data is optional – the data do not currently contribute to assessment scores, they hold potential value for future vegetation integrity assessment attributes and benchmarks, and for enhancing PCT description.

Physiography + safe features that may help in determining PCT and Management Zone (optional)

Morphological Type	Flat	Landform Element		Landform Pattern	River flat	Height of tallest veg	–
Lithology	Alluvial	Soil Surface Texture	Loamy clay	Soil Colour	Brown	Height of shrub layer	–
Slope	0°	Aspect	–	Site Drainage		Height of ground layer	0.3m

Plot Disturbance	Severity Code	Age Code	Observational evidence
Clearing (inc. logging)	3	O	
Cultivation (inc. pasture)	3:2	O	
Soil erosion	–		
Firewood/CWD removal	–		
Grazing (identify native/stock)	3	R	
Fire damage	–		
Storm damage	–		
Weediness	2	NR	
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

On low bench above riparian zone. Flat.

400 m² plot: Sheet 1 of 1	Survey Name	Plot Identifier	Recorders
Date 23/7/24	Lot 1+5 Mt Darragh	Lot 1+5 BAM09	James Schlunke

GF Code	*Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species. Full species name where practicable*	N, E or HTE	Cover	Abund	stratum	voucher
	Microlaena stipoides		35	5000		
	Trifolium repens		0.3	500		
	Holcus lanatus		40	3000		
	Paspalum dilatatum		0.4	100		
	Hypochaeris radicata		0.2	100		
	Conyza bonariensis		15	1000		
	Cirsium vulgare		0.2	50		
	Hypochaeris glabra		0.1	20		
	Phalaris ~~aquatica~~ aquatica		0.3	100		2-2
	Sporobolus ~~?fertilis~~ africanus		0.1	3		2-1
	Juncus ~~?usitatus~~ continuus		0.1	3		
	Agrostis capillaris		0.1	10		1-8
	Sonchus asper		0.1	2		
	Cerastium sol. sol.		0.1	1		
	Taraxacum officinale		0.1	2		
	Rumex brownii		0.1	1		
	Senecio madagascariensis		0.1	1		
	Rumex conglomeratus		0.1	1		
	Dactylis glomerata		2	500		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.
Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*
Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

Appendix C: Vegetation survey data

Table 9-1: Vegetation survey data and locations

plot	pct	area	patch size	condition class	zone	easting	northing	bearing	compTree	compShrub	compGrass	compForbs	compFerns	compOther	strucTree	strucShrub	strucGrass	strucForbs	strucFerns	strucOther	funLargeTrees	funHollowtrees	funLitterCover	funLenFallenLogs	funTreeStem5to9	funTreeStem10to19	funTreeStem20to29	funTreeStem30to49	funTreeStem50to79	funTreeRegen	funHighThreatExotic
4	3181	5.91	15	Exotic grassland	55	-36.941153	149.814514	30	0	0	1	1	0	0	0.0	0.0	0.1	0.1	0.0	0.0	0	0	66.0	0.0	0	0	0	0	0	0	90.1
5	3181	5.91	15	Exotic grassland	55	-36.941227	149.815759	115	0	0	1	0	0	0	0.0	0.0	0.1	0.0	0.0	0.0	0	0	76.0	0.0	0	0	0	0	0	0	90.3
6	3181	5.91	15	Exotic grassland	55	-36.941149	149.817134	335	0	0	1	1	0	0	0.0	0.0	0.1	0.1	0.0	0.0	0	0	73.0	0.0	0	0	0	0	0	0	70.0
8	4061	1.85	5	Poor-mod	55	-36.939668	149.815027	90	0	2	6	4	0	0	0.0	0.5	76.5	0.4	0.0	0.0	0	0	58.0	0.0	0	0	0	0	0	0	8.1
3	3181	0.65	1	Scattered tree	55	-36.940893	149.813404	5	1	0	0	2	0	0	45.0	0.0	0.0	0.2	0.0	0.0	1	0	71.0	24.0	0	0	1	1	1	0	73.0
7	3181	2.30	3	DNG_poor	55	-36.940483	149.813969	100	0	0	2	2	0	0	0.0	0.0	40.1	0.2	0.0	0.0	0	0	88.0	0.0	0	0	0	0	0	0	35.2
9	3181	2.30	3	DNG_poor	55	-36.940236	149.816148	190	0	0	2	2	0	0	0.0	0.0	35.1	0.2	0.0	0.0	0	0	67.0	0.0	0	0	0	0	0	0	15.6
2	3181	0.42	1	DNG_mod	55	-36.939533	149.817811	170	0	0	5	3	1	0	0.0	0.0	70.3	0.4	0.2	0.0	0	0	64.0	0.0	0	0	0	0	0	0	0.6
1	3192	1.74	3	Moderate	55	-36.93895	149.81696	196	1	9	12	19	0	2	8.0	16.6	29.8	3.1	0.0	0.3	0	0	50.0	143.0	0	0	1	1	0	0	16.9

Appendix D: Flora species recorded

Scientific name	Common Name	Family
*Conium maculatum	Hemlock	Apiaceae
*Cyclospermum leptophyllum	Slender Celery	Apiaceae
Hydrocotyle acutiloba	-	Apiaceae
Hydrocotyle tripartita	Pennywort	Apiaceae
*Araujia sericifera	Moth Vine	Apocynaceae
*Zantedeschia aethiopica	Arum Lily	Araceae
*Bidens pilosa	Cobbler's Pegs	Asteraceae
Cassinia trinerva	-	Asteraceae
*Cirsium vulgare	Spear Thistle	Asteraceae
*Conyza spp.	-	Asteraceae
Cotula australis	Common Cotula	Asteraceae
*Delairea odorata	Cape Ivy	Asteraceae
*Gamochaeta americana	Cudweed	Asteraceae
*Gamochaeta spp.	-	Asteraceae
*Hypochaeris glabra	Smooth Catsear	Asteraceae
*Hypochaeris radicata	Catsear	Asteraceae
*Leontodon saxatilis	Lesser Hawkbit	Asteraceae
Senecio linearifolius	Fireweed Groundsel	Asteraceae
*Senecio madagascariensis	Fireweed	Asteraceae
Sigesbeckia orientalis subsp. orientalis	Indian Weed	Asteraceae
*Sonchus asper	Prickly Sowthistle	Asteraceae
*Sonchus oleraceus	Common Sowthistle	Asteraceae
*Tagetes minuta	Stinking Roger	Asteraceae
*Taraxacum officinale	Dandelion	Asteraceae
Blechnum nudum	Fishbone Water Fern	Blechnaceae
Hackelia latifolia	-	Boraginaceae
*Rorippa nasturtium-aquaticum	Watercress	Brassicaceae
Callitriche muelleri	-	Callitrichaceae
Lobelia purpurascens	whiteroot	Campanulaceae
Wahlenbergia gracilis	Sprawling Bluebell	Campanulaceae
*Cerastium glomeratum	Mouse-ear Chickweed	Caryophyllaceae

Scientific name	Common Name	Family
**Paronychia brasiliana*	Chilean Whitlow Wort, Brazilian Whitlow	Caryophyllaceae
**Polycarpon tetraphyllum*	Four-leaved Allseed	Caryophyllaceae
Stellaria flaccida	-	Caryophyllaceae
**Stellaria media*	Common Chickweed	Caryophyllaceae
Einadia nutans subsp. nutans	Climbing Saltbush	Chenopodiaceae
**Tradescantia fluminensis*	Wandering Jew	Commelinaceae
Calystegia marginata	-	Convolvulaceae
Crassula helmsii	Swamp Stonecrop	Crassulaceae
Sicyos australis	-	Cucurbitaceae
Bolboschoenus spp.	-	Cyperaceae
Carex inversa	Knob Sedge	Cyperaceae
Carex longebrachiata	-	Cyperaceae
**Cyperus eragrostis*	Umbrella Sedge	Cyperaceae
Isolepis spp.	Club-rush	Cyperaceae
Schoenoplectus validus	-	Cyperaceae
Hypolepis muelleri	Harsh Ground Fern	Dennstaedtiaceae
Pteridium esculentum	Bracken	Dennstaedtiaceae
Leucopogon juniperinus	Prickly Beard-heath	Ericaceae
Beyeria lasiocarpa	-	Euphorbiaceae
**Euphorbia peplus*	Petty Spurge	Euphorbiaceae
**Lotus uliginosus*	Birds-foot Trefoil	Fabaceae (Faboideae)
**Trifolium arvense*	Haresfoot Clover	Fabaceae (Faboideae)
**Trifolium repens*	White Clover	Fabaceae (Faboideae)
Acacia floribunda	White Sally	Fabaceae (Mimosoideae)
Acacia mearnsii	Black Wattle	Fabaceae (Mimosoideae)
**Fumaria muralis subsp. muralis*	Wall Fumitory	Fumariaceae
**Centaurium erythraea*	Common Centaury	Gentianaceae
Geranium solanderi var. solanderi	-	Geraniaceae

Scientific name	Common Name	Family
**Myriophyllum aquaticum*	Parrots Feather	Haloragaceae
**Juncus bulbosus*	-	Juncaceae
Juncus continuus	-	Juncaceae
Plectranthus parviflorus	-	Lamiaceae
Prostanthera incisa	Cut-leaved Mint-bush	Lamiaceae
Lomandra longifolia	Spiny-headed Mat-rush	Lomandraceae
Eustrephus latifolius	Wombat Berry	Luzuriagaceae
Lythrum hyssopifolia	Hyssop Loosestrife	Lythraceae
Androcalva fraseri	Brush Kurrajong	Malvaceae
**Modiola caroliniana*	Red-flowered Mallow	Malvaceae
Stephania japonica	Snake vine	Menispermaceae
Angophora floribunda	Rough-barked Apple	Myrtaceae
Callistemon subulatus	-	Myrtaceae
Eucalyptus baueriana	Blue Box	Myrtaceae
Eucalyptus elata	River Peppermint	Myrtaceae
Eucalyptus viminalis	Ribbon Gum	Myrtaceae
Kunzea ambigua	Tick Bush	Myrtaceae
Kunzea ericoides	Burgan	Myrtaceae
Leptospermum emarginatum	Twin-flower Tea-tree	Myrtaceae
Melaleuca armillaris subsp. armillaris	Bracelet Honey-myrtle	Myrtaceae
Melaleuca parvistaminea	-	Myrtaceae
Sannantha pluriflora	-	Myrtaceae
Oxalis perennans	-	Oxalidaceae
Oxalis spp.	-	Oxalidaceae
**Passiflora edulis*	Common Passionfruit	Passifloraceae
Phyllanthus gunnii	-	Phyllanthaceae
**Phytolacca octandra*	Inkweed	Phytolaccaceae
**Plantago lanceolata*	Lamb's Tongues	Plantaginaceae
**Veronica anagallis-aquatica*	Blue Water-speedwell	Plantaginaceae
Veronica plebeia	Trailing Speedwell	Plantaginaceae
**Agrostis capillaris*	Browntop Bent	Poaceae

Scientific name	Common Name	Family
**Andropogon virginicus*	Whisky Grass	Poaceae
**Axonopus fissifolius*	Narrow-leafed Carpet Grass	Poaceae
**Axonopus fissifolius*	Narrow-leafed Carpet Grass	Poaceae
**Cenchrus clandestinus*	Kikuyu Grass	Poaceae
Cynodon dactylon	Common Couch	Poaceae
**Dactylis glomerata*	Cocksfoot	Poaceae
**Ehrharta erecta*	Panic Veldtgrass	Poaceae
**Ehrharta erecta*	Panic Veldtgrass	Poaceae
Entolasia marginata	Bordered Panic	Poaceae
**Eragrostis curvula*	African Lovegrass	Poaceae
Eragrostis leptostachya	Paddock Lovegrass	Poaceae
**Holcus lanatus*	Yorkshire Fog	Poaceae
Isachne globosa	Swamp Millet	Poaceae
Microlaena stipoides var. stipoides	Weeping Grass	Poaceae
**Paspalum dilatatum*	Paspalum	Poaceae
**Phalaris aquatica*	Phalaris	Poaceae
Poa labillardierei var. labillardierei	Tussock	Poaceae
**Setaria parviflora*	-	Poaceae
**Sporobolus africanus*	Parramatta Grass	Poaceae
Themeda triandra	-	Poaceae
**Acetosa sagittata*	Rambling Dock	Polygonaceae
Persicaria decipiens	Slender Knotweed	Polygonaceae
Persicaria decipiens	Slender Knotweed	Polygonaceae
Persicaria praetermissa	-	Polygonaceae
Rumex brownii	Swamp Dock	Polygonaceae
**Rumex conglomeratus*	Clustered Dock	Polygonaceae
**Lysimachia arvensis*	Scarlet Pimpernel	Primulaceae
Lomatia myricoides	River Lomatia	Proteaceae
Adiantum aethiopicum	Common Maidenhair	Pteridaceae
Pellaea falcata	Sickle Fern	Pteridaceae
Ranunculus inundatus	River Buttercup	Ranunculaceae

Scientific name	Common Name	Family
**Ranunculus repens*	Creeping Buttercup	Ranunculaceae
Pomaderris aspera	Hazel Pomaderris	Rhamnaceae
Pomaderris cinerea	-	Rhamnaceae
**Rubus fruticosus sp. agg.*	Blackberry complex	Rosaceae
Rubus parvifolius	Native Raspberry	Rosaceae
**Galium aparine*	Goosegrass	Rubiaceae
Opercularia aspera	Coarse Stinkweed	Rubiaceae
**Salix spp.*	-	Salicaceae
Gratiola peruviana	Australian Brooklime	Scrophulariaceae
**Verbascum thapsus subsp. thapsus*	Great Mullein	Scrophulariaceae
**Physalis peruviana*	Cape Gooseberry	Solanaceae
Solanum linearifolium	Mountain Kangaroo Apple	Solanaceae
**Solanum nigrum*	Black-berry Nightshade	Solanaceae
Solanum prinophyllum	Forest Nightshade	Solanaceae
**Solanum pseudocapsicum*	Madeira Winter Cherry	Solanaceae
Pimelea axiflora	-	Thymelaeaceae
Typha orientalis	Broad-leaved Cumbungi	Typhaceae
Trema tomentosa var. aspera	Native Peach	Ulmaceae
Parietaria debilis	Native Pellitory	Urticaceae
**Urtica urens*	Small Nettle	Urticaceae
**Verbena bonariensis*	Purpletop	Verbenaceae
Melicytus dentatus	Tree Violet	Violaceae
Viola hederacea	Ivy-leaved Violet	Violaceae
**Viola odorata*	Sweet Violet	Violaceae

* denotes introduced species

Appendix E: Fauna species recorded

Taxa	Scientific Name	Common Name
Amphibia	*Crinia signifera*	Clicking Froglet
Amphibia	*Litoria ewingii*	Southern Brown Tree Frog
Amphibia	*Litoria nudidigitus*	Southern Leaf-green Tree Frog
Aves	*Acanthiza lineata*	Striated Thornbill
Aves	*Acanthiza pusilla*	Brown Thornbill
Aves	*Anas superciliosa*	Pacific Black Duck
Aves	*Anthochaera carunculata*	Red Wattlebird
Aves	*Aquilla audax*	Wedge-tailed Eagle
Aves	*Cacatua galerita*	Sulphur-crested Cockatoo
Aves	*Colluricincla harmonica*	Grey Shrike-thrush
Aves	*Coracina novaehollandiae*	Black-faced Cuckoo-shrike
Aves	*Cormobates leucophaea*	White-throated Treecreeper
Aves	*Corvus coronoides*	Australian Raven
Aves	*Cracticus tibicen*	Australian Magpie
Aves	*Cracticus torquatus*	Grey Butcherbird
Aves	*Dacelo novaeguineae*	Laughing Kookaburra
Aves	*Egretta novaehollandiae*	White-faced Heron
Aves	*Eolophus roseicapillus*	Galah
Aves	*Eopsaltria australis*	Eastern Yellow Robin
Aves	*Falco berigora*	Brown Falcon
Aves	*Grallina cyanoleuca*	Magpie-lark
Aves	*Leucosarcia picata*	Wonga Pigeon
Aves	*Lichenostomus chrysops*	Yellow-faced Honeyeater
Aves	*Lichenostomus leucotis*	White-eared Honeyeater
Aves	*Malurus cyaneus*	Superb Fairy-wren
Aves	*Manorina melanophrys*	Bell Miner
Aves	*Meliphaga lewinii*	Lewin's Honeyeater
Aves	*Microeca fascinans*	Jacky Winter
Aves	*Neochmia temporalis*	Red-browed Finch

Taxa	Scientific Name	Common Name
Aves	*Pachycephala pectoralis*	Golden Whistler
Aves	*Pardalotus striatus*	Striated Pardalote
Aves	*Platycercus elegans*	Crimson Rosella
Aves	*Platycercus eximius*	Eastern Rosella
Aves	*Psophodes olivaceus*	Eastern Whipbird
Aves	*Ptilonorhynchus violaceus*	Satin Bowerbird
Aves	*Rhipidura albiscapa*	Grey Fantail
Aves	*Rhipidura leucophrys*	Willie Wagtail
Aves	*Strepera graculina*	Pied Currawong
Aves	*Threskiornis spinicollis*	Straw-necked Ibis
Aves	*Trichoglossus haematodus*	Rainbow Lorikeet
Aves	*Vanellus miles*	Masked Lapwing
Mammalia	*Macropus giganteus*	Eastern Grey Kangaroo
Mammalia	*Pseudocheirus peregrinus*	Common Ringtail Possum
Mammalia	*Vombatus ursinus*	Common Wombat
Mammalia	*Vulpes vulpes*	Fox