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Biodiversity Certification Assessment Report

Lot 2 DP1126288 & Lot 224 DP7555952 South Nowra

Report Prepared by Narla Environmental

For

Lysand Pty Ltd & Lyrock Pty Ltd

June 2026



NARLA

environmental

Report:	Biodiversity Certification Assessment Report – Lot 2 DP1126288 & Lot 224 DP7555952 South Nowra
Prepared for:	Lysand Pty Ltd & Lyrock Pty Ltd
Prepared by:	Narla Environmental Pty Ltd
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The report has been prepared in accordance with the Biodiversity Certification Assessment Report Template (DPE 2022a)

Executive Summary

Narla Environmental Pty Ltd (Narla) was engaged by Lysand Pty Ltd & Lyrock Pty Ltd ('the proponent') to prepare a Biodiversity Certification Assessment Report (BCAR) to accompany a Planning Proposal to assess the associated impacts with the proposed certification at Lot 2 DP1126288 & Lot 224 DP7555952 South Nowra, hereafter referred to as the Subject Property. This BCAR has assessed the biodiversity impacts of the proposed planning proposal in accordance with the requirements of the Biodiversity Conservation Act 2016 and Biodiversity Conservation Regulation 2017. The assessment has been completed in accordance with Appendix K of the Biodiversity Assessment Method (BAM; DPIE 2020a).

The planning proposal proposes to change part of the zoning within the Subject Property from E3 – Productivity Support to part residential (R2) and Conservation Land (C2). The proposed indicative built form of the Subject Land following the certification would result in residential lots, as well as a proposed Onsite Stormwater Detention (OSD) and internal roads. All areas associated with the indicative built form associated with the proposed planning proposal will be hereafter referred to as the Subject Land. The Subject Land covers the eastern half of the Subject Property, an area of approximately 16.58ha, consisting of native vegetation in varying condition classes, a creek, and cleared informal roadways.

Due to the vegetated nature of the Subject Property, complete avoidance of native vegetation clearing is not feasible. However, a portion of the Subject Property has been retained as a rehabilitated wetland, and the proposed built form of the planning proposal will avoid these areas.

Consultation with the Department and Local council has resulted in the amended Planning Proposal subsequently removing the re-zoning of the western portion of the Subject Property. This area will be retained under the current zoning (E3: Productivity Support) and currently consists of native bushland reflective of the BC act and EPBC Act listed Illawarra Lowland Grassy Woodland (ILGW) TEC. Additional surveys were conducted to map existing habitat/hollow bearing trees within the Subject Land. All hollow bearing trees within the Subject Land are proposed to be retained and protected. The habitat trees are isolated to the remnant vegetation located along the southern border adjoining Warra Warra Road. The planning proposal will dedicate a 50m wide corridor along the southern border as Conservation Zoning (C2). This will ensure the habitat trees are protected and formalise the connectivity between the regionally significant Browns Creek wildlife corridor and Worrigee Nature Reserve. Whilst the connectivity does rely on the private bushland of the property on the southeastern border. This property is currently owned and operated as a Rifle Range and risks of the bushland being cleared are considered low. The indicative road layout includes a nature strip through the centre of the residential zoning breaking up the built form and provide an opportunistic connectivity route. Specific landscaping plan has not been provided for review. However, it is recommended that street trees be planted along the roads and consist of native canopy species reflecting the ILGW TEC. .

During the pre-construction phase, it is recommended that the proponent prepare a Construction Environmental Management Plan (CEMP) that includes industry-standard measures for managing soil, surface water, weeds, and pollutants, as well as site-specific procedures. The CEMP will incorporate mitigation and management measures to protect biodiversity and nearby properties in accordance with relevant policies and guidelines. Additionally, a Vegetation Management Plan (VMP) should be prepared by a qualified restoration ecologist for the 30m Riparian Buffer and retained bushland areas within the Subject Property. A Project Ecologist with appropriate qualifications and licenses will be commissioned to conduct pre-clearing surveys, supervise dewatering of dams, and oversee the clearance of trees and shrubs to safely capture and relocate native species. Tree protection measures will be implemented in accordance with Australian Standard 4970 (2009) to establish Tree Protection Zones (TPZ) and ensure the viability of retained trees. During the construction and post-construction phases, hollows removed from trees should be replaced with artificial nest boxes at a 1:1 ratio. Erosion and sediment control measures will be maintained throughout construction to avoid indirect impacts on biodiversity, complying with relevant

guidelines such as the Blue Book. Temporary fencing will also be erected around retained native vegetation to protect it from construction impacts.

The proposed certification is expected to impact on one (1) Plant Community Type (PCT):

- PCT 3269: Shoalhaven Lowland Spotted Gum-Paperbark Forest

The following ecosystem credits are required to be offset in order to mitigate the likely impacts to biodiversity as a result of the planning proposal:

- 146 ecosystem credits for PCT 3269

Areas of vegetation identified as PCT 3269 within the Subject Land conforms to the following Biodiversity Conservation Act 2016 (BC Act) listed Critically Endangered Ecological Community:

- Illawarra Lowlands Grassy Woodland in the Sydney Basin Bioregion

Vegetation within the Subject Land was also found to conform to the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) listed Critically Endangered Community Illawarra and south coast lowland forest and woodland.

Illawarra lowlands grassy woodland in the Sydney Basin Bioregion is listed as 'SAIL entities' within the BioNet Threatened Biodiversity Data Collection. Due to the potential sensitivity of these entities to any impact, a determination of whether or not the proposed impacts are serious and irreversible has been undertaken in accordance with Section 9.1 of the BAM (DPIE 2020a) 'Additional impact assessment provisions for threatened species or populations'.

1,490 species credit species were required to be assumed present owing to the presence of suitable habitat within the Subject Land and a lack of suitable survey in accordance with DPE guidelines being conducted at the time of preparing this report to confirm their absence. The following species credits are therefore required to be offset in order to mitigate the impacts upon these species as a result of the planning proposal:

- 48 species credits for *Callocephalon fimbriatum* (Gang-gang Cockatoo)
- 48 species credits for *Calyptorhynchus lathami lathami* (South-eastern Glossy Black-Cockatoo)
- 146 species credits for *Cercartetus nanus* (Eastern Pygmy-possum)
- 109 species credits for *Cryptostylis hunteriana* (Leafless Tongue Orchid)
- 48 species credits for *Haliaeetus leucogaster* (White-bellied Sea-Eagle)
- 109 species credits for *Heleioporus australiacus* (Giant Burrowing Frog)
- 36 species credits for *Hieraetus morphnoides* (Little Eagle)
- 146 species credits for *Isodon obesulus obesulus* (Southern Brown Bandicoot (eastern))
- 146 species credits for *Litoria aurea* (Green and Golden Bell Frog)
- 36 species credits for *Lophoictinia isura* (Square-tailed Kite)
- 146 species credits for *Myotis macropus* (Southern Myotis)
- 36 species credits for *Pandion cristatus* (Eastern Osprey)
- 48 species credits for *Petauroides volans* (Southern Greater Glider)
- 48 species credits for *Petaurus norfolcensis* (Squirrel Glider)
- 146 species credits for *Phascogale tapoatafa* (Brush-tailed Phascogale)
- 48 species credits for *Phascolarctos cinereus* (Koala)
- 146 species credits for *Sminthopsis leucopus* (White-footed Dunnart)

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Glossary

Acronym/ Term	Definition
Accredited Biodiversity Assessor	Individuals accredited by the Department of Planning, and Environment (DPE) to apply the Biodiversity Assessment Method.
asl	above sea level
APZ	Asset Protection Zone
BAM	The NSW Biodiversity Assessment Method (2020)
BAMC	The NSW Biodiversity Assessment Method Calculator
BC Act	New South Wales Biodiversity Conservation Act 2016
BCAR	Biodiversity Certification Assessment Report
BDAR	Biodiversity Development Assessment Report
Biodiversity credit report	The report produced by the Credit Calculator that sets out the number and class of biodiversity credits required to offset the remaining adverse impacts on biodiversity values at a development site, or on land to be biodiversity certified.
Biodiversity offsets	Management actions that are undertaken to achieve a gain in biodiversity values on areas of land in order to compensate for losses to biodiversity from the impacts of development.
Biodiversity values	The composition, structure and function of ecosystems, including threatened species, populations and ecological communities, and their habitats.
BOS	NSW Biodiversity Offset Scheme
DA	Development Application
DPE	NSW Department of Planning and Environment (formerly DPIE)
DPIE	NSW Department of Planning, Industry and Environment (Now DPE)
Ecosystem credit	The class of biodiversity credit that relates to a vegetation type and the threatened species that are reliably predicted by that vegetation type (as a habitat surrogate).
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
ha	Hectares
HTE	High Threat Exotic
IBRA7	Interim Biogeographic Regionalisation for Australia 7
IPA	Inner Protection Area

Acronym/ Term	Definition
km	Kilometres
LALC	Local Aboriginal Land Council
LGA	Local Government Area
Locality	A 1,500m buffer area surrounding the Subject Land
m	metres
Native Vegetation	Any of the following types of plants native to New South Wales: (a) trees (including any sapling or shrub), (b) understorey plants, (c) groundcover (being any type of herbaceous vegetation), (d) plants occurring in a wetland.
NSW	The State of New South Wales
OEH	Office of Environment and Heritage (now DPE)
OPA	Outer Protection Area
PCT	NSW Plant Community Type
Proposal	The development, activity or action proposed
SAIL	Serious and Irreversible Impacts
SAIL entity	Species and ecological communities that are likely to be the subject of serious and irreversible impacts (SAILs)
SEPP	State Environmental Planning Policy
Species credit	The class of biodiversity credit that relate to threatened species that cannot be reliably predicted to use an area of land based on habitat surrogates. Species that require species credits are listed in the Threatened Biodiversity Data Collection.
Subject Land	All areas subject to the proposed planning proposal
Subject Property	Lot 2 DP1126288 & Lot 224 DP7555952, Warra Warra Road, South Nowra
TEC	Threatened Ecological Community
Threatened species, populations and ecological communities	Species, populations and ecological communities specified in Schedules 1 and 2 of the BC Act 2016
VI	Vegetation Integrity
VIS Plot	Vegetation Integrity Survey Plot

Declarations

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

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



Luke Johnson BSc
Project Manager / Senior Ecologist
Accredited Biodiversity Assessor (BAAS23028)
Narla Environmental Pty Ltd
Date: 07/05/2026

II. Details and experience of author/s and contributors

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Luke Johnson	BAAS23028	Project Manager and Senior Ecologist	Report Preparation, Document Review, BAM-C Data entry and analysis	<i>BSc (Ecology)</i>
Brodie Miller	N/a	Ecologist	Field Surveys, Report Preparation, Literature Review and Desktop Research	<i>BA MEnvMgt (Cons)</i>
Gemma Hicks	N/a	Ecologist	Field Surveys, Targeted Flora and Fauna Surveys	<i>BBioCon</i>
Phil Maxwell	N/a	Ecologist	Field Surveys, Targeted Flora and Fauna Surveys	<i>BSc (EnvSci)</i>

III. Conflict of Interest

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



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Narla Environmental Pty Ltd
Date: 07/05/2026

1. Introduction

1.1 Overview

Narla Environmental Pty Ltd (Narla) was engaged by Lysand Pty Ltd & Lyrock Pty Ltd ('the proponent') to prepare a Biodiversity Certification Assessment Report (BCAR) to accompany a Planning Proposal to assess the associated impacts with the proposed certification at Lot 2 DP1126288 & Lot 224 DP7555952 South Nowra, hereafter referred to as the Subject Property (**Figure 1**). Planning proposals are required to utilise Stage 1 of the BAM for areas which will be rezoned for land use intensification. The potential impacts associated with certification will trigger a BCAR as impacts will exceed the clearing threshold (0.50ha) for a property with minimum lot sizes of 16ha and 11ha. This BCAR will assess likely biodiversity impacts that are likely to arise as a result of the planning proposal in accordance with the requirements of the BC Act, Biodiversity Conservation Regulation 2017 and BAM (DPIE 2020a).

Narla have produced this report in order to assess any potential impacts associated with the planning proposal and recommend appropriate measures to mitigate any potential ecological impacts in line with the requirements of the Consent Authority. The assessment has been completed in accordance with Appendix K of the BAM (DPIE 2020a).

1.2 The Planning Proposal

The planning proposal proposes to change part of the zoning within the Subject Property from E3 – Productivity Support to part residential (R2) and Conservation Land (C2). The proposed indicative built form of the Subject Land following the certification would result in residential lots, as well as a proposed Onsite Stormwater Detention (OSD) and internal roads. All areas associated with the indicative built form associated with the proposed planning proposal will be hereafter referred to as the Subject Land (**Figure 1**). The Subject Land covers the eastern half of the Subject Property, an area of approximately 16.58ha, consisting of native vegetation in varying condition classes, a creek, and cleared informal roadways.

1.3 Site Location and Description

The Subject Property is situated within a mixed commercial, industrial and bushland landscape in the suburb of South Nowra in the Shoalhaven Council Local Government Area (LGA; **Figure 2**). It is surrounded by commercial and industrial land uses to the west; R1 residential zoning has been approved adjoining the northern boundary and consisted of constructed roads and residential lots. The Subject Land bisects conservation zoned land associated with the Browns Creek Corridor on the north and Worrigee Nature Reserve on the northeast. The proposed C2 zoning will formalise this corridor through adjoining bushland to the east and south. The Subject Land is located within the boundaries of the Nowra Local Aboriginal Land Council (Aboriginal Land Council 2024).

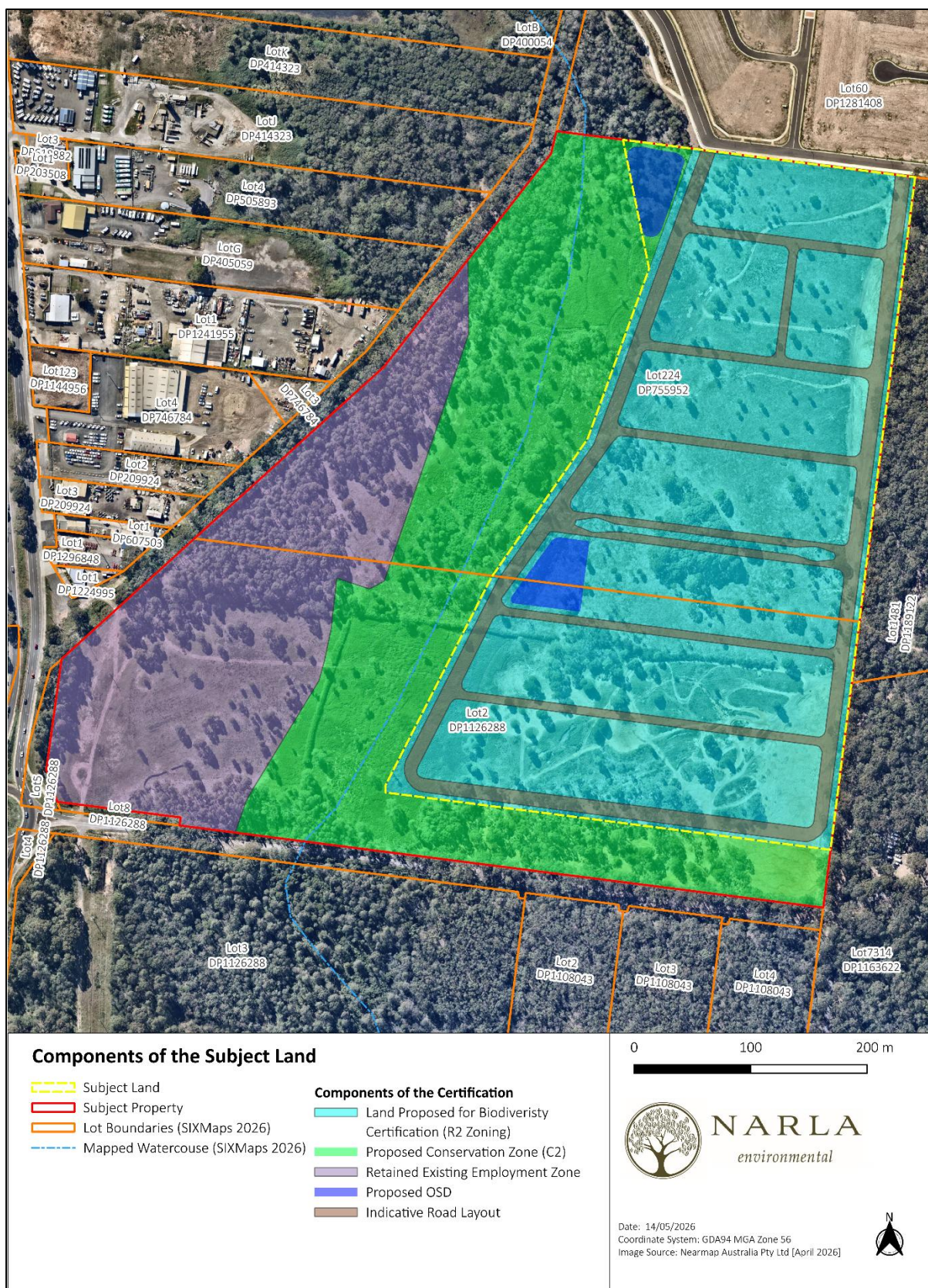


Figure 1. Components of the Subject Land

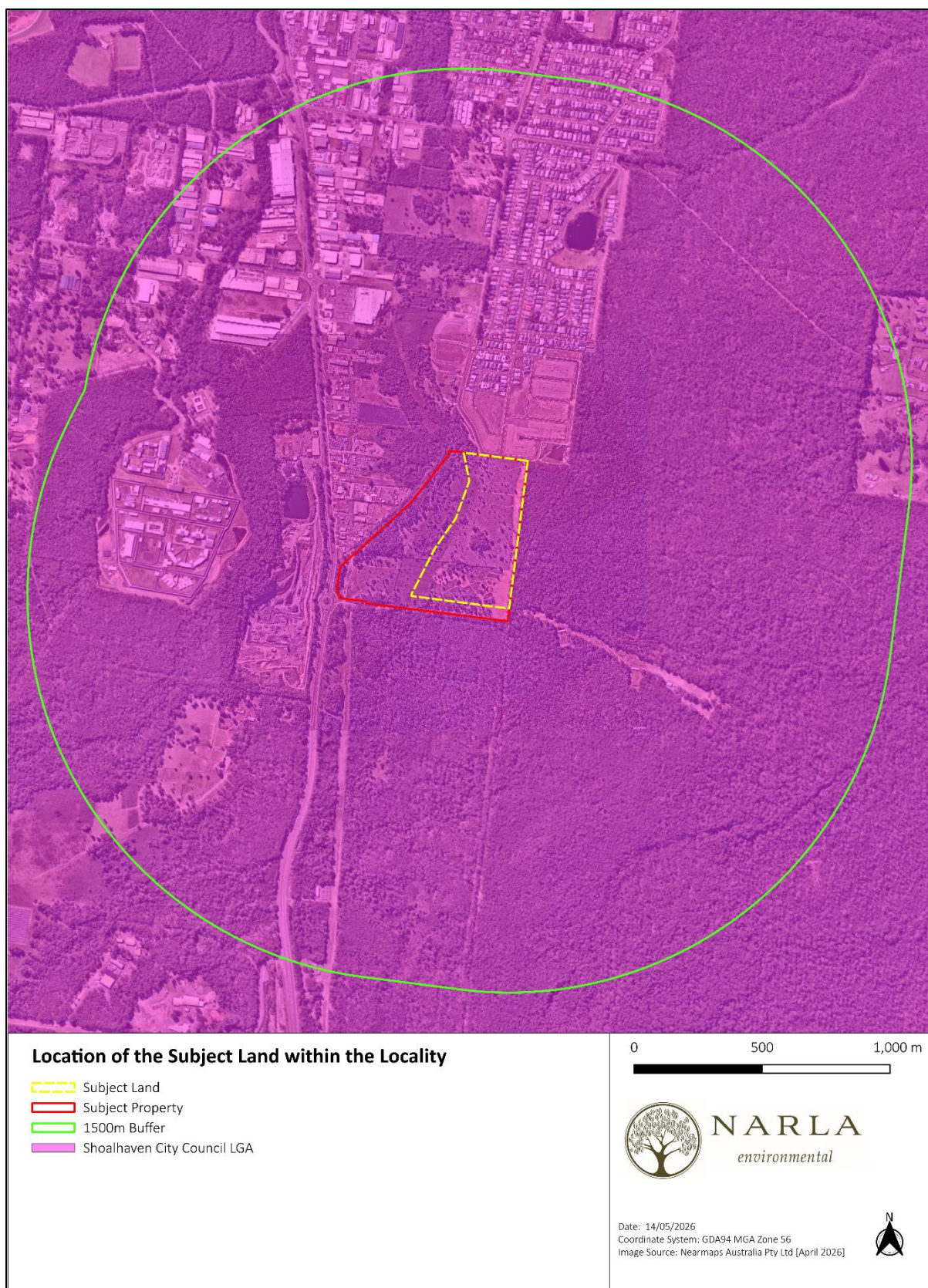


Figure 2. The location of the Subject Land within the locality.

1.4 Sources of Information Used

A thorough literature review was undertaken to gain an insight into the ecology and applicable legislation within the locality and the Shoalhaven Council LGA, including:

- Relevant State and Commonwealth Databases & Datasets:
 - NSW BioNet. Vegetation Classification System (NDCCEEW 2026c);
 - NSW BioNet. The website of the Atlas of NSW Wildlife (NDCCEEW 2026d);
 - NSW BioNet. Threatened Biodiversity Data Collection NDCCEEW 2026e); and
 - Six Maps Clip & Ship (NSW Government Spatial Services 2026);
- Vegetation and Soil Mapping:
 - NSW State Vegetation Type Map (NDCCEEW 2025);
 - Soil Landscapes of Kiama 1:100,000 Sheets (Hazelton 1992).
- NSW State Guidelines:
 - Biodiversity Assessment Method (DPIE 2020a);
 - Guidance to assist a decision-maker to determine a serious and irreversible impact (DPIE 2019);
 - Biodiversity Assessment Method Calculator Version 1.4.0.00 (NDCCEEW 2026f);
 - Biodiversity Offsets and Agreement Management System (BOAMS);
 - Surveying threatened plants and their habitats - NSW survey guide for the Biodiversity Assessment Method (DPIE 2020b);
 - NSW Survey Guide for Threatened Frogs: A guide for the survey of threatened frogs and their habitats for the Biodiversity Assessment Method (DPIE 2020c);
 - NSW Threatened Reptiles Biodiversity Assessment Method Survey Guide (DPE 2022b);
 - NSW Species credit threatened bats and their habitat: NSW survey guide for the Biodiversity Assessment Method (OEH 2018); and
 - Threatened Species Survey and Assessment: Guidelines for developments and activities. Working Draft (DEC 2004);
- Council Documents:
 - Shoalhaven Local Environmental Plan 2014;
 - Shoalhaven 2040: Local Strategic Planning Statement 2025; and
 - Shoalhaven Development Control Plan 2014.

Preparation of this BCAR also involved the review of the following accompanying project documents:

- Warra Warra Road South Nowra Planning Proposal Zones Proposed (Jervis Bay Town Planning 2026);
- Master Plan for Lot 2 DP1126288 & Lot 224 DP7555952 South Nowra (Jervis Bay Town Planning 2024);
- Strategic Bushfire Assessment for the proposed rezoning of Warra Warra & Old Southern Road, South Nowra (Harris Environmental Consulting 2026); and
- Watercycle Management Plan Warra Warra Road, South Nowra (CivPlan 2026).

These sources were used to gain an understanding of the natural environment and ecology of the Subject Land and its surrounds. Searches using NSW Wildlife Atlas (BioNet; NDCCEEW 2026d) were conducted to identify current threatened flora and fauna records within and surrounding the Subject Land. These data were used to assist in establishing the presence or likelihood of any biodiversity values as occurring on, or adjacent the Subject Land and helped inform our Ecologist on what to look for during the site assessment.

1.5 Consultation

Consultation has been undertaken with the Shoalhaven City Council and the Department (CPHR). The following feedback related to biodiversity was received:

- The site is mapped as part of a regionally significant wildlife corridor (Illawarra Shoalhaven Regional Plan 2040) and consideration should be given to connecting areas of protected vegetation and maintaining or improving adjoining corridor widths.
- No impact assessment has been provided for the Australasian Bittern (*Botaurus poiciloptilus*).

The amended Planning Proposal has subsequently removed the re-zoning of the western portion of the Subject Property. This area will be retained under the current zoning (E3: Productivity Support) and currently consists of native bushland reflective of the BC act and EPBC Act listed Illawarra Lowland Grassy Woodland (ILGW) TEC. Additional surveys were conducted to map existing habitat/hollow bearing trees within the Subject Land. All hollow bearing trees within the Subject Land are proposed to be retained and protected. The habitat trees are isolated to the remnant vegetation located along the southern border adjoining Warra Warra Road. The planning proposal will dedicate a 50m wide corridor along the southern border as Conservation Zoning (C2). This will ensure the habitat trees are protected and formalise the connectivity between the regionally significant Browns Creek wildlife corridor and Worrigee Nature Reserve. Whilst the connectivity does rely on the private bushland of the property on the southeastern border. This property is currently owned and operated as a Rifle Range and risks of the bushland being cleared are considered low. The indicative road layout includes a nature strip through the centre of the residential zoning breaking up the built form and provide an opportunistic connectivity route. Specific landscaping plan has not been provided for review. However, it is recommended that street trees be planted along the roads and consist of native canopy species reflecting the ILGW TEC. Additional mitigations and recommendations are provided in **Section 6**.

1.6 Aim and Approach

This report has been prepared in accordance with the BAM (DPIE 2020a) and aims to:

- Describe the biodiversity values present within the Subject Land, including the extent of native vegetation, vegetation integrity and the presence of Threatened Ecological Communities (TECs);
- Determine the habitat suitability within the Subject Land for candidate threatened species;
- Prepare an impact assessment in regard to potential impacts of the planning proposal on biodiversity values, including potential prescribed impacts and SAIIs within the Subject Land;
- Discuss and recommend efforts to avoid and minimise impacts on biodiversity values; and
- Calculate the biodiversity credits (i.e., ecosystem credits and species credits) that measure potential impacts of the development on biodiversity values. This calculation will inform the decision maker as to the number and class of offset credits required to be purchased and retired as a result of the planning proposal.

2. Landscape

2.1 IBRA Bioregion and Subregion

The Subject Land occurs within the 'Jervis' Interim Biogeographic Regionalisation for Australia 7 (IBRA7) Subregion, which is part of the 'Sydney Basin' IBRA7 Bioregion (**Figure 3**).

2.2 Mitchell Landscapes

Mitchell (2002) groups ecosystems into meso-ecosystems representing larger natural entities based on topography and geology. The naming of ecosystems and meso-ecosystems was standardised so that each name provided information on location and a meaningful descriptive landscape term.

The Subject Land is mapped as occurring on the 'Bomaderry Plains' Mitchell Landscape, with a very small portion of the Subject Property mapped as occurring on the Nowra-Durra Coastal Slopes Landscape (**Figure 4**).

The Bomaderry Plains Landscape is characterised by quaternary silt and mud cover the back plains of the Shoalhaven floodplain, with relief less than 10 meters. Organic uniform loam and silt loam are widespread. Limited dark texture-contrast soils are found on levees and terrace remnants. Swamps with dense clay were originally common but have now been drained and cleared. Decorative paperbark (*Melaleuca* spp.), Swamp Oak (*Casuarina glauca*), Forest Red Gum (*Eucalyptus tereticornis*), and Sydney Peppermint (*Eucalyptus piperita*) are present. Remnant Illawarra Flame Tree (*Brachychiton acerifolius*), Cabbage-tree Palm (*Livistona australis*), and Port Jackson Fig (*Ficus rubiginosa*) mark the locations of original coastal brush patches.

The Nowra-Durras Coastal Slopes landscape is comparable to the Dapto-Wollongong slopes but with lower relief, undulating slopes, and lower rainfall, the area features Permian lithic sandstone and pebbly siltstone with yellow and yellow-red texture-contrast soils. Its general elevation ranges from 20 to 80 meters, with local relief measuring around 30 meters. The landscape is characterized by open forest dominated by *Corymbia maculata* (Spotted Gum), with extensive undergrowth of *Macrozamia* sp. and Blady Grass (*Imperata cylindrica*). Freshwater Reed (*Phragmites australis*) swamps are found on wider valley floors, merging down valley with Swamp Oak (*Casuarina glauca*) communities. As the landscape extends southward, it widens and may pose challenges in distinguishing it from the Wandandian Coastal Plains landscape in the field.

2.3 Topography, Geology and Soils

The Subject Land contains mostly flat terrain with an average elevation of 42m above sea level (amsl; Google Earth 2026).

The Subject Land is situated on the Nowra soil landscape according to the Soil Landscapes of Kiama (Hazelton 1992). The Nowra soil landscape's geology is primarily characterized by Nowra Sandstone, consisting of medium- to coarse-grained quartz sandstones with scattered rounded pebbles throughout the beds. West of the village of Kangaroo Valley, there are localized areas of laterization. In terms of topography, the area features moderately to gently undulating rises leading to undulating low hills, with relief exceeding 40 meters and slopes greater than 5%. It encompasses broad ridges and crests with long, very gently inclined slopes, along with broad drainage areas featuring deeply incised channels. Additionally, benched sandstone outcrops can be found adjacent to drainage lines.

The Subject Land did not contain any areas of geological significance, such as karsts, caves, cliffs, or crevices nor are any considered likely to occur in the immediate vicinity owing to the relatively flat nature of the landscape.

No areas within the Subject Land or broader locality (1500m buffer) were mapped as occurring on Acid Sulfate Soils nor were they mapped as having risk/probability of exhibiting occurrence of acid sulphate soils.

2.4 Hydrology

The Subject Land intersects one 3rd order watercourse, Browns Creek, and its associated 30m riparian buffer (**Figure 5**). Several watercourses and associated riparian buffer zones occur within the 1,500m buffer surrounding the Subject Land, ranging from 1st to 3rd order watercourses (**Figure 6**).

2.5 State Environmental Planning Policy (Resilience and Hazards) 2021 – Chapter 2: Coastal Management

The Subject Land does not contain any areas identified as ‘Coastal Wetlands’ or ‘Littoral Rainforest’ as per Chapter 2 of the State Environmental Planning Policy (Resilience and Hazards) 2021, nor do any areas of Coastal Wetland occur within the greater locality (1500m buffer).

2.6 Native Vegetation Cover and Connectivity

Native vegetation cover and connectivity have been assessed in accordance with Section 3.1.3 and 3.2 of the BAM (DPIE 2020a). The native vegetation cover will be used to assess the habitat suitability of the Subject Land for threatened species. Areas of connectivity will determine the extent of habitat that may facilitate the movement of threatened species across their range. A 1,500m buffer around the boundary of the Subject Land was calculated to determine the extent of native vegetation and habitat connectivity. Native vegetation covered approximately 732ha within the buffer circle (total area = 997ha) and was assigned to the >70% class.

Continuous areas of habitat connectivity that may facilitate the movement of threatened species were evident within the 1,500m surrounding the Subject Land (**Figure 7**).

2.7 Areas of Outstanding Biodiversity Value

No Areas of Outstanding Biodiversity Value occur on the Subject Land or surrounding area.

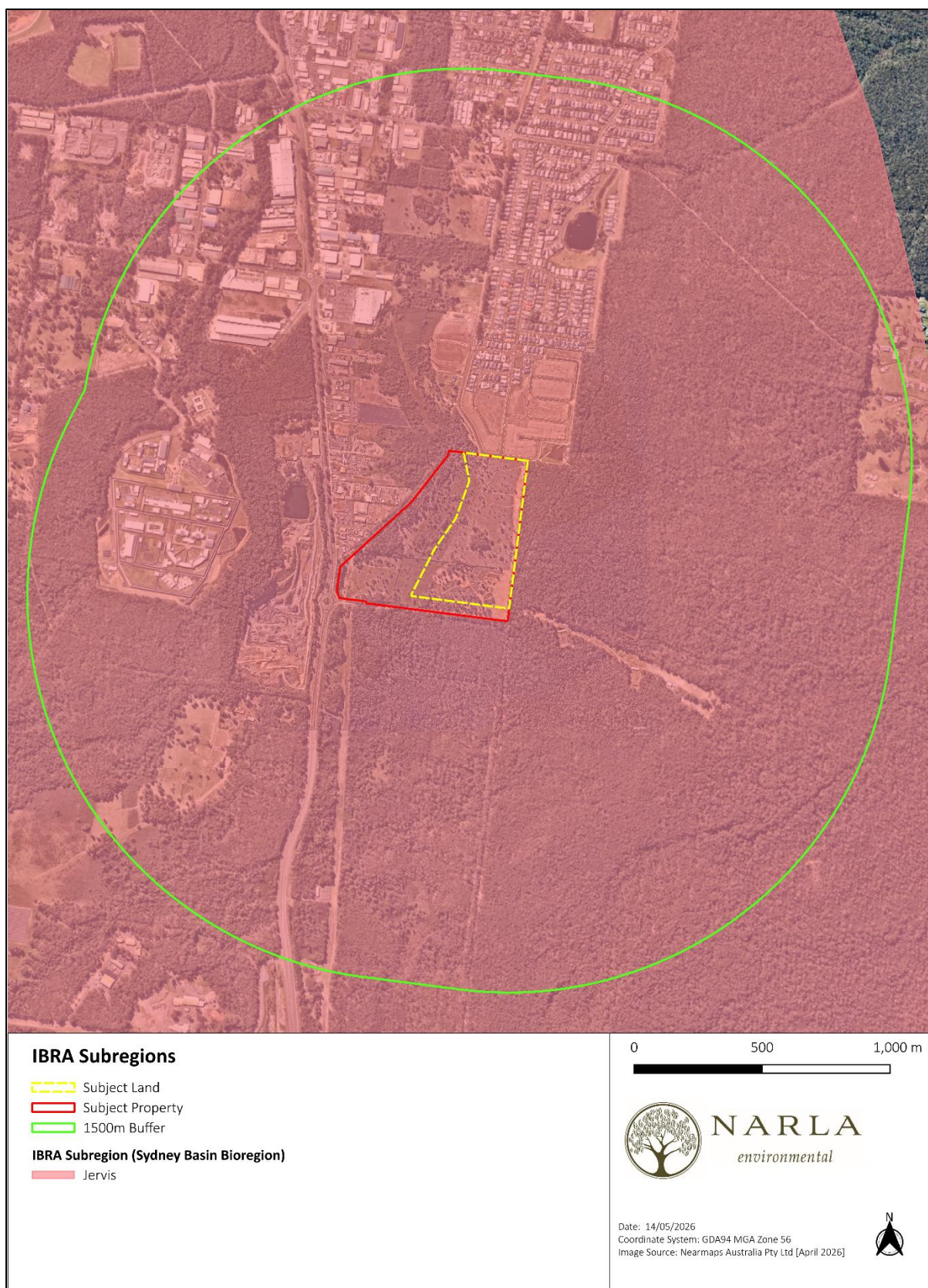


Figure 3. IBRA Bioregion and Subregion of the Subject Property, Subject Land and within a 1,500m buffer.



Figure 4. Mitchell Landscapes of the Subject Property, Subject Land and within a 1,500m buffer.

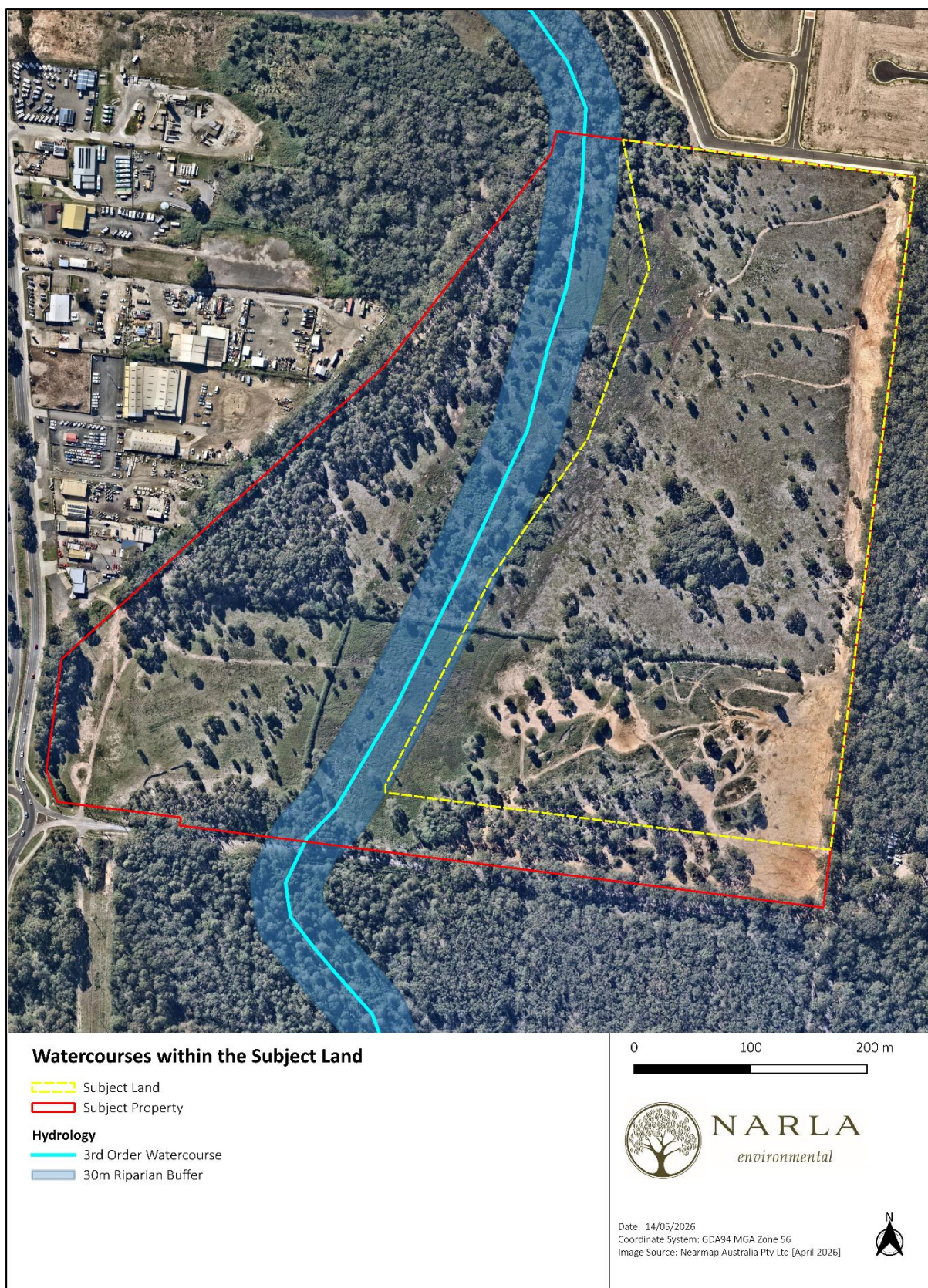


Figure 5. Watercourses and waterbodies within and surrounding the Subject Land.

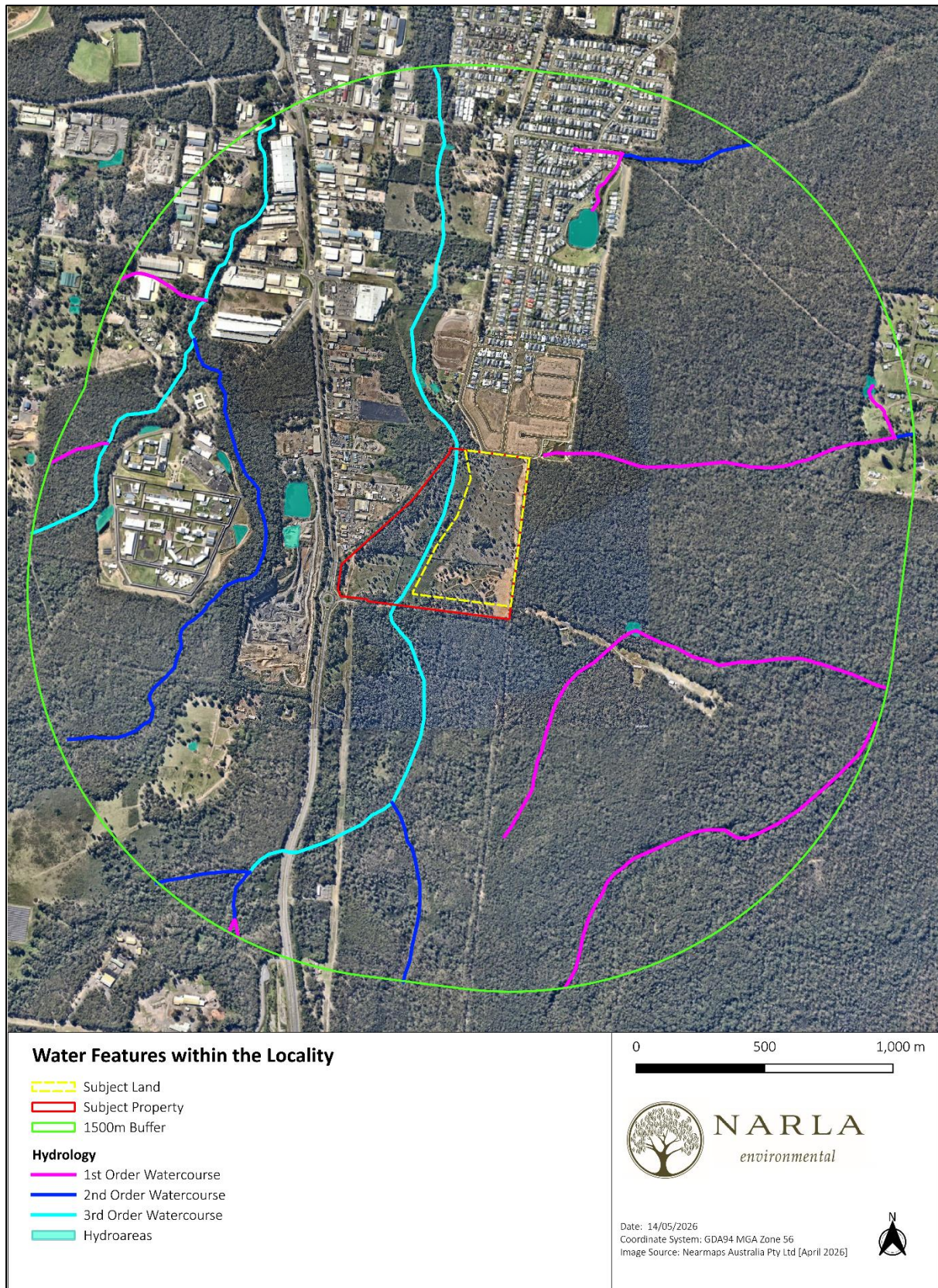


Figure 6. Watercourses occurring within the 1,500m buffer.

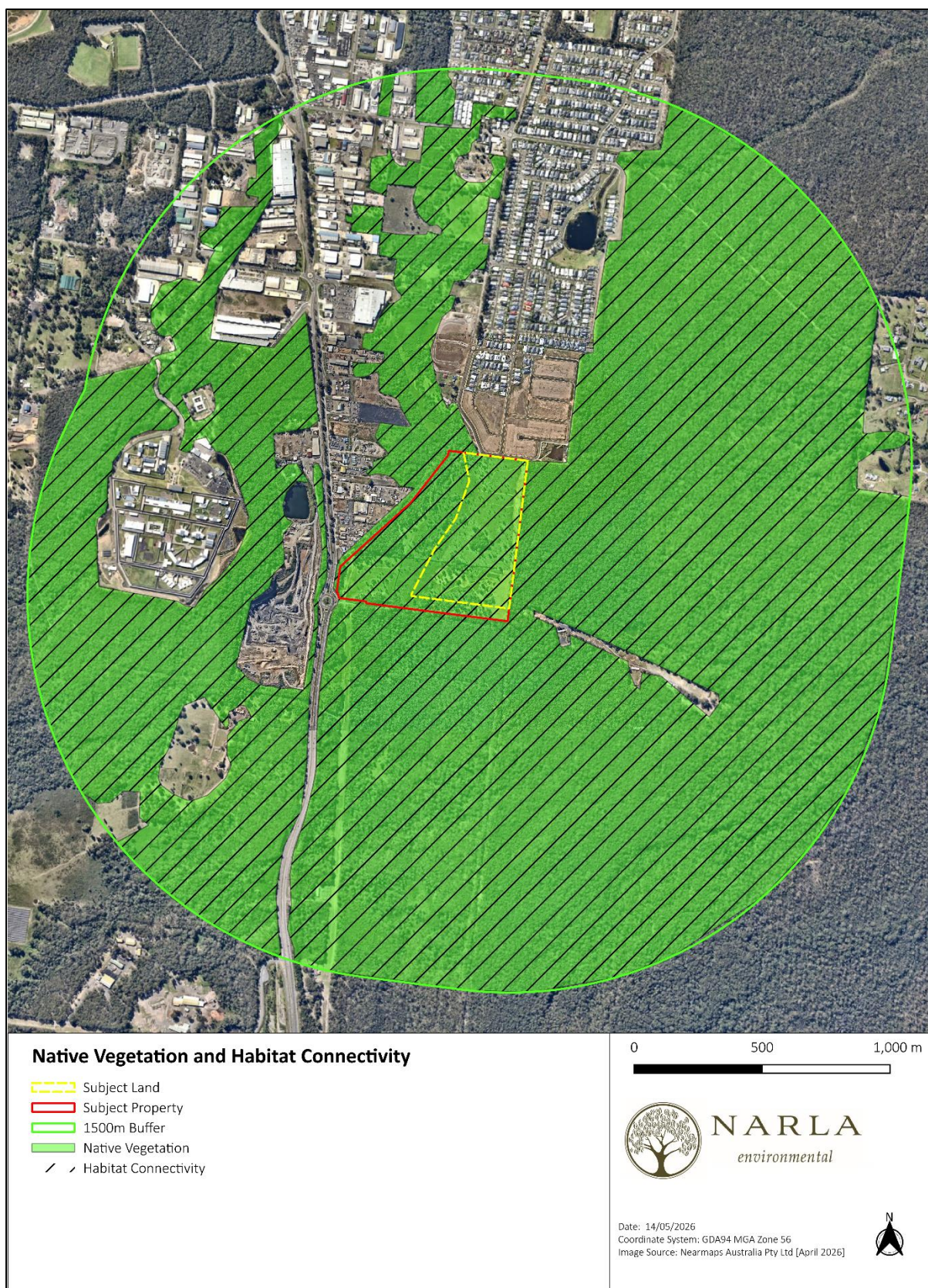


Figure 7. The extent of native vegetation and habitat connectivity within the 1,500m buffer.

3. Native Vegetation

3.1 Plant Community Type (PCT) Identified within the Subject Land

3.1.1 Historically Mapped Vegetation

The NSW State Vegetation Type Map (NDCCEEW 2025) identified areas of ‘not classified vegetation’ as well as the presence of the following native vegetation communities within and surrounding the Subject Land (**Figure 8**):

- PCT 3258: Sydney Basin Creekflat Blue Gum-Apple Forest; and
- PCT 3269: Shoalhaven Lowland Spotted Gum-Paperbark Forest.

3.1.2 Plant Community Type Selection Process

Plant Community Type (PCT) selection for the vegetation communities occurring on the Subject Land was undertaken using information and databases provided in the BioNet Vegetation Classification System (NDCCEEW 2026c). The following selection criteria were used in the PCT Filter Tool (NDCCEEW 2026g) to develop the PCT shortlist.

- IBRA Bioregion: Sydney Basin Bioregion
- IBRA Subregion: Jervis
- Dominant Species: *Corymbia maculata*, *Eucalyptus paniculata*, *Kunzea ambigua*, *Leptospermum continentale*, *Melaleuca decora*, *Pimelea linifolia*

This process delivered a selection of four (4) PCT's that occur within the Jervis IBRA Subregion that had all of the observed dominant species (i.e., the highest potential of occurring within the Subject Land). The geographical distribution and landscape position characterised by each shortlisted PCT was then compared against the location and landscape of the Subject Land. It was found that the Subject Land was located in the right distribution and contained the appropriate landscape attributes and geology for three (3) of the candidate PCTs (**Table 1**). The steps taken to justify the presence of the best-fit PCT within the Subject Land are detailed in **Table 2**.

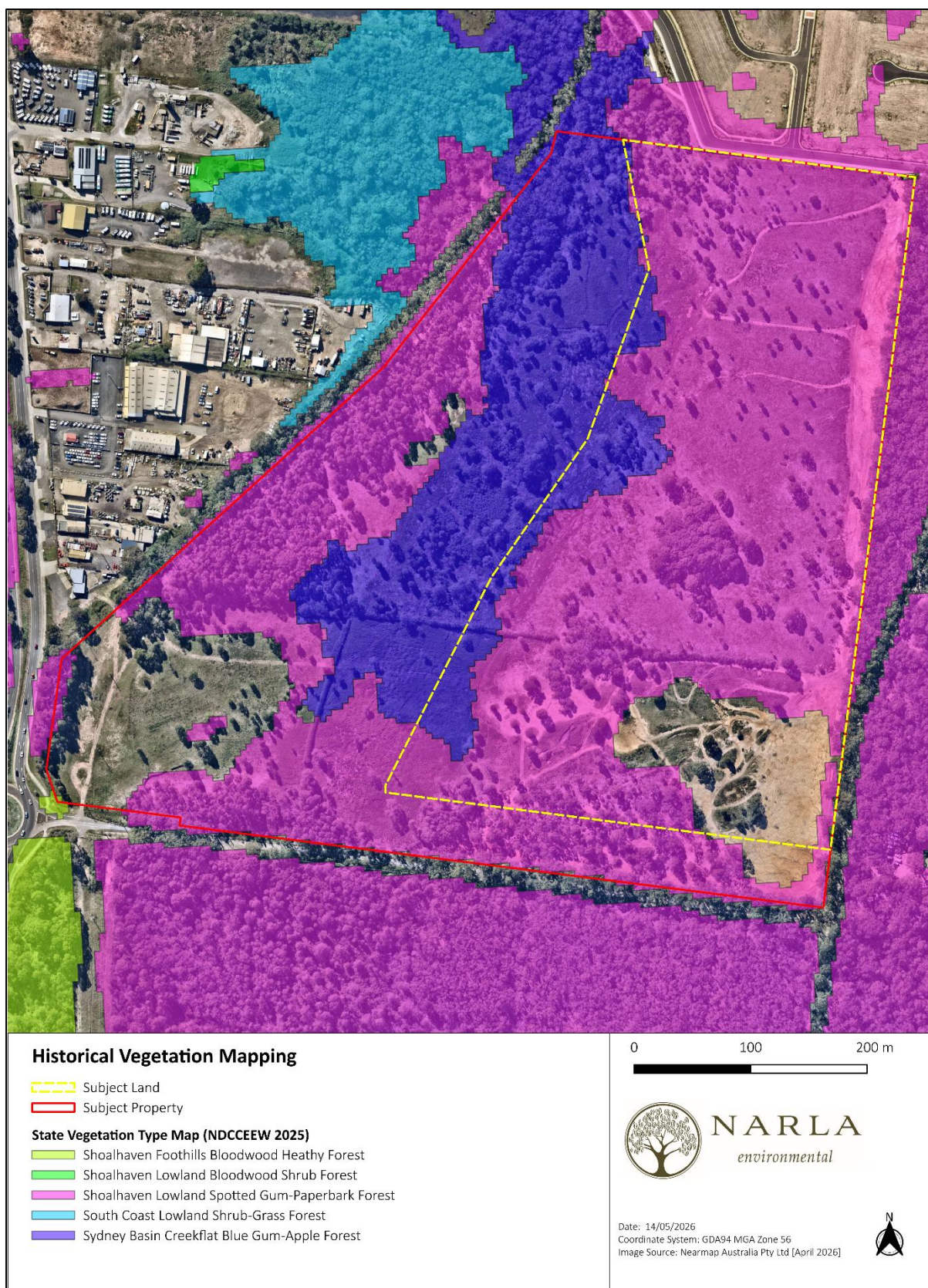


Figure 8. Historically mapped vegetation communities within and adjacent to the Subject Land (NDCCEEW 2025).

Table 1. Output from the PCT Filter Tool (DPE 2024g) and subsequent shortlisting of dominant PCTs. Green shading indicates the selected best fit dominant PCT.

Plant Community Type (PCT)	Subject Land within known geographic distribution/landscape position or on suitable geology.	No. of Dominant Floristic Matches (/6)
PCT 3269: Shoalhaven Lowland Spotted Gum-Paperbark Forest	Yes. This PCT is a very tall dry shrubby layered sclerophyll open forest with a ground cover of grasses and graminoids. It is typically found on low-lying Permian siltstones around Nowra in the Shoalhaven region. Recent survey data indicates a highly restricted distribution below 60 m asl, mainly within a 5-km radius of Nowra. Historical clearing activities have likely diminished the original extent of this PCT in the gentle depressions and creeks on the Nowra lowlands. The Subject Land matches the geographic position, landscape position and geology for this PCT.	6
PCT 3273: South Coast Lowland Shrub-Grass Forest	Yes. This PCT is a tall to very tall sclerophyll open forest with a very sparse dry shrub layer and a ground cover of grasses, graminoids, and ferns. It is typically found on low-lying landscapes of the south coast between Nowra and Tathra. This PCT occurs across a wide range of coarse to fine-grained sediments on gentle gradients on low elevation coastal landscapes. It is most extensive across the Shoalhaven lowlands, where it has a strong association with Permian sediments from the Wandrawandian Formation. The Subject Land matches the geographic position, landscape position and geology for this PCT.	6
PCT 3330: South Coast Lowland Woollybutt Grassy Forest	Yes. This PCT is characterized by a tall sclerophyll open forest. This vegetation is mainly found in low-lying flats below 70 m asl with damp clay loam soils and partially impeded drainage on the south coast. It is primarily located in valleys and floodplains around Lake Illawarra and in the Moruya to Congo area, with smaller occurrences near Worrigea and Kioloa. The natural distribution of this PCT has been significantly reduced due to land clearing, and it remains vulnerable to ongoing fragmentation and invasion by weeds. The Subject Land matches the geographic position, landscape position and geology for this PCT.	6
PCT 4049: South Coast Floodplain Grassy Swamp Forest	No. This PCT is a tall grassy open forest found on low-lying slightly saline sites on coastal floodplain margins and headland soaks in the southern Sydney Basin and northern South East Corner bioregions. It is distributed between Narooma and Wollongong at elevations of 2-25 m asl in areas receiving 1000-1350 mm mean annual rainfall, commonly on organic-rich sandy clay alluvium. The Subject Land does not match the landscape position (below 25asl) and geology (alluvial soils) for this PCT.	6

Table 2. PCT selection criteria. Green indicates the selected PCT.

Candidate PCT	PCT Description (DPE 2024c)	Justification
PCT 3269: Shoalhaven Lowland Spotted Gum- Paperbark Forest	A very tall dry shrubby layered sclerophyll open forest with a ground cover of grasses and graminoids found on low-lying Permian siltstones around Nowra, Shoalhaven region. The tree canopy almost always includes a higher cover of <i>Corymbia maculata</i> , very frequently in combination with <i>Eucalyptus longifolia</i> and <i>Eucalyptus paniculata</i> and commonly <i>Eucalyptus globoidea</i> . The mid-stratum is typically layered with a sparse cover of taller small trees including <i>Melaleuca decora</i> and <i>Allocasuarina littoralis</i> . A sparse lower layer of dry shrubs very frequently includes <i>Daviesia ulicifolia</i> with <i>Pultenaea villosa</i> and commonly <i>Acacia falcata</i> and <i>Lissanthe strigosa</i> . The ground layer is a mid-dense cover of grasses, graminoids, and forbs, very frequently or commonly including <i>Entolasia stricta</i> , <i>Lomandra longifolia</i> , <i>Dianella revoluta</i> , <i>Themeda triandra</i> , and <i>Brunoniella pumilio</i> . Current survey data indicates a highly restricted distribution below 60 meters asl mainly within a five-kilometre radius of Nowra. Past clearing has likely reduced the original extent of this PCT in the gentle depressions and creeks on the Nowra lowlands. This community grades into tall eucalypt forest PCT 4020 on some creek flats and dry shrub forest PCT 3273 and heathy woodland PCT 3654 on soils derived from Permian sandstone.	Narla has allocated this PCT to the vegetation within the Subject Land, because it best fits the landscape position, known distribution, and species composition of the Subject Land. While this PCT shares similarities with PCT 3273, PCT 3269 was chosen due to the higher frequency of key diagnostic species that were observed on the Subject Land matches the BioNet (DPE 2024c) classifications: ▪ <i>Corymbia maculata</i>: 100 for PCT 3269 vs. 20 for PCT 3273 ▪ <i>Eucalyptus paniculata</i>: 71 for PCT 3269 vs. 32 for PCT 3273 ▪ <i>Melaleuca decora</i>: 59 for PCT 3269 vs. 20 for PCT 3273
PCT 3273: South Coast Lowland Shrub- Grass Forest	A tall to very tall sclerophyll open forest with a very sparse dry shrub layer and a ground cover of grasses, graminoids, and ferns found on low-lying landscapes of the south coast between Nowra and Tathra. The tree canopy is highly variable with no single eucalypt species consistently recorded. <i>Eucalyptus pilularis</i> and <i>Corymbia gummifera</i> are both commonly recorded together with a high cover across extensive areas. However, either or both may be replaced or associated with <i>Corymbia maculata</i> , <i>Eucalyptus sclerophylla</i> , <i>Eucalyptus longifolia</i> , <i>Eucalyptus paniculata</i> , or <i>Eucalyptus punctata</i> . One or more species from the stringybark eucalypt group are also commonly found in association, with <i>Eucalyptus globoidea</i> the most frequent. The mid-stratum is typically very sparse, however, is layered with a taller cover of small trees that very frequently includes <i>Allocasuarina littoralis</i> . In addition, sites on poorly defined open gentle depressions include a sparse cover of <i>Melaleuca</i> species, the most frequent and abundant being <i>Melaleuca decora</i> and <i>Melaleuca ericifolia</i> .	Narla did not allocate this particular PCT for the Subject Land as it was identified that there was better fit concerning landscape position, known distribution, species composition, and historical mapping. While PCT 3273 is similar to PCT 3269, the latter was chosen due to the higher frequency of key diagnostic species observed on the Subject Land: ▪ <i>Corymbia maculata</i>: 100 for PCT 3269 vs. 20 for PCT 3273 ▪ <i>Eucalyptus paniculata</i>: 71 for PCT 3269 vs. 32 for PCT 3273

Candidate PCT	PCT Description (DPE 2024c)	Justification
	The lower dry shrub layer is also very sparse, only rarely mid-dense. Typically, one or two individuals of species including <i>Banksia spinulosa</i>, <i>Acacia binervata</i>, <i>Leptospermum polygalifolium</i>, and <i>Pittosporum undulatum</i> are recorded. The characteristic feature of this PCT is the mid-dense to dense ground cover of grasses, graminoids, forbs, and ferns. The grasses <i>Entolasia stricta</i>, <i>Entolasia marginata</i>, <i>Microlaena stipoides</i>, <i>Imperata cylindrica</i> are all very frequent, with <i>Themeda triandra</i> also common. Very frequently occurring graminoid species such as <i>Dianella caerulea</i>, <i>Lomandra longifolia</i>, and <i>Lepidosperma laterale</i>, with occasional high cover of <i>Gahnia radula</i>, add to the grass-like appearance of the ground cover. Forbs such as <i>Lobelia purpurascens</i> and <i>Brunoniella pumilio</i>, as well as the fern <i>Pteridium esculentum</i>, are all very frequent, the latter with a patchy cover. This PCT occurs across a wide range of coarse to fine-grained sediments on gentle gradients on low elevation coastal landscapes. It is most extensive across the Shoalhaven lowlands where it has a strong association with Permian sediments from the Wandrawandian Formation. In this region, the PCT grades into PCT 3654 or 3588 on sandier soils, with the former distinguished by a shrubbier understorey and <i>Syncarpia glomulifera</i> while the latter has a lower canopy height and distinctive mid-stratum of Proteaceae species. Elsewhere it occurs around St Georges Basin on Permian sandstones, and on sandstones of the Abercrombie Formation on the southern limits of its distribution. As elevation declines to around 10 meters asl this community can grade into forested swamp PCTs 4049 and 4009. Frequent fire appears to be typical of these landscapes.	<i>Melaleuca decora</i>: 59 for PCT 3269 vs. 20 for PCT 3273
PCT 3330: South Coast Lowland Woollybutt Grassy Forest	A tall sclerophyll open forest with a dense to patchy mid-stratum of <i>Melaleucas</i> and a grassy ground layer that is restricted to low-lying flats of below 70 metres asl with damp clay loam soils and partially impeded drainage on the south coast. It primarily occurs in valleys and floodplains around Lake Illawarra and in the Moruya to Congo area, with smaller occurrences near Worrigee and Kioloa. The canopy very frequently includes <i>Eucalyptus longifolia</i> and stringybark eucalypts (<i>Eucalyptus globoidea</i> or rarely <i>Eucalyptus eugenioides</i>), commonly associated with <i>Eucalyptus tereticornis</i>. Commonly, there is a distinct mid-stratum that includes a high cover of <i>Melaleucas</i>, the most frequent of which is <i>Melaleuca decora</i>. The remaining components of the mid-stratum comprise scattered small trees and shrubs and almost always include	Narla did not allocate this particular PCT for the Subject Land as it was identified that there was better fit concerning landscape position, known distribution, species composition, and historical mapping. While PCT 3330 is similar to PCT 3269, the latter was chosen due to the higher frequency of key diagnostic species observed on the Subject Land: <i>Corymbia maculata</i>: 100 for PCT 3269 vs. 16 for PCT 3330

Candidate PCT	PCT Description (DPE 2024c)	Justification
	<i>Acacia</i> species of which <i>Acacia longifolia</i> and <i>Acacia binervata</i> are most frequent. The <i>acacias</i> are commonly accompanied by <i>Leucopogon juniperinus</i> and <i>Pittosporum undulatum</i> and occasionally by <i>Ozothamnus diosmifolius</i>. A dense ground layer is typically comprised of a diverse suite of grasses and forbs with some twiners, graminoids and a hardy fern. <i>Lobelia purpurascens</i> and <i>Glycine clandestina</i> are almost always present and <i>Entolasia stricta</i>, <i>Microlaena stipoides</i>, <i>Cymbopogon refractus</i>, <i>Echinopogon caespitosus</i>, <i>Dichondra repens</i>, <i>Cheilanthes sieberi</i> subsp. <i>sieberi</i>, <i>Eragrostis leptostachya</i>, <i>Lomandra longifolia</i> and <i>Themeda triandra</i> are very frequent. The naturally limited distribution of this PCT has been severely depleted by land clearing and it is susceptible to ongoing fragmentation and weed invasion. On the <i>Illawarra</i> plain, with improved drainage and reduced soil clay content it grades into <i>PCT 3327</i>, and at <i>Moruya</i> with improved drainage it grades into <i>PCT 4052</i>. <i>Eucalyptus tereticornis</i> is very frequent to almost always present in these PCTs.	▪ <i>Eucalyptus paniculata</i>: 71 for PCT 3269 vs. 7 for PCT 3330 ▪ <i>Melaleuca decora</i>: 59 for PCT 3269 vs. 44 for PCT 3330

3.1.3 Final PCT and Vegetation Zone Selection

The field survey conducted by experienced Narla Ecologists confirmed the presence of one (1) PCT within the Subject Land:

- PCT 3269: Shoalhaven Lowland Spotted Gum-Paperbark Forest.

The Subject Land was then separated into two (2) vegetation zones that consisted of differing condition classes of PCT 3269:

- Vegetation Zone 1: PCT 3269 – Moderate (All Strata Present); and
- Vegetation Zone 2: PCT 3269 – Low (Reduced Canopy).

These vegetation zones are detailed in **Table 3** and displayed in **Figure 9**.

Table 3. PCT 3269 identified within the Subject Land.

PCT 3269: Shoalhaven Lowland Spotted Gum-Paperbark Forest		
Vegetation Class	Coastal Valley Grassy Woodlands	
Total Area within the Subject Land	13.47ha	
Condition Class	Moderate (All Strata Present)	Low (Reduced Canopy)
Vegetation Zone	1	2
Extent within Subject Land (approximate)	2.45ha	11.02ha
Field survey effort	Four (4) 20mx50m VIS plots were conducted.	Three (3) 20mx50m VIS plots were conducted.
Description of vegetation	The vegetation within this zone is characterised by intact vegetation across all strata levels. The canopy layer includes native tree species such as <i>Corymbia maculata</i>, <i>Eucalyptus paniculata</i>, <i>Eucalyptus globoidea</i>, and <i>Eucalyptus tereticornis</i>. The mid-storey layer consists of native shrub species including <i>Pimelea linifolia</i>, <i>Kunzea ambigua</i>, <i>Melaleuca decora</i>, <i>Hakea sericea</i>, and various <i>Acacia</i> species. The ground layer features native grasses and forbs such as <i>Entolasia stricta</i>, <i>Aristida ramosa</i>, <i>Microlaena stipoides</i>, <i>Cymbopogon refractus</i>, and <i>Lobelia purpurascens</i>. A low cover of exotic species is present, including but not limited to <i>Senna pendula</i> var. <i>glabrata</i>, <i>Araujia sericifera</i>, <i>Ageratina adenophora</i> and <i>Cirsium vulgare</i>.	This vegetation zone has been historically altered, resulting in isolated and sparse canopy trees among shrub and grassland-dominated areas. The native canopy species are sparse and include <i>Corymbia maculata</i>, <i>Eucalyptus paniculata</i>, <i>Eucalyptus globoidea</i>, and <i>Eucalyptus tereticornis</i>. The native mid-storey species primarily consist of <i>Pimelea linifolia</i>, <i>Kunzea ambigua</i>, <i>Melaleuca decora</i>, <i>Hakea sericea</i>, and various <i>Acacia</i> species. The native ground layer species include but are not limited to <i>Entolasia stricta</i>, <i>Aristida ramosa</i>, <i>Microlaena stipoides</i>, <i>Cymbopogon refractus</i>, and <i>Lobelia purpurascens</i>. The exotic species present include <i>Sporobolus fertilis</i>, <i>Senecio madagascariensis</i>, <i>Axonopus fissifolius</i>, <i>Paspalum dilatatum</i>, among others.
Structure of vegetation	The structure scores of all four VIS plots were averaged, revealing a canopy cover of 41.6%, a shrub cover of 35.8%, grass and grass-like cover 3.75%, a forb cover of 1.23%, and an “other” cover of 0.1%. A variety of stem classes were present, ranging from regenerating stems to stems >50cm DBH. The average litter cover across the 4	The structure scores of all three VIS plots were averaged, revealing a canopy cover of 2.83%, a shrub cover of 60%, grass and grass-like cover of 4%, a forb cover of 0.76%, and an “other” cover of 0.1%. Stem classes range from regenerating stems to 10-19 DBH. No hollow bearing trees were recorded. The average litter cover was

PCT 3269: Shoalhaven Lowland Spotted Gum-Paperbark Forest		
	plots was 53.75%. The average length of fallen logs is 2.37m. The average HTE cover is 8.1%. One hollow bearing tree was present.	15.3% across the 3 plots. The average HTE cover is 4.73%. The average log length is 0.66m.
TEC Status (BC Act 2016)	Conforms to the Endangered Ecological Community Illawarra Lowlands Grassy Woodland in the Sydney Basin Bioregion. See section 3.2.1.	Conforms to the Endangered Ecological Community Illawarra Lowlands Grassy Woodland in the Sydney Basin Bioregion. See section 3.2.1.
TEC Status (EPBC Act 1999)	Conforms to Critically Endangered Ecological Community Illawarra and south coast lowland forest and woodland ecological community. See section 3.2.2.	Conforms to Critically Endangered Ecological Community Illawarra and south coast lowland forest and woodland ecological community. See section 3.2.2.
Scientific Reference from VIS (DPE 2024c)	Connolly, D., Binns, D., Turner, K., Hager, T., Lyons, M., Magarey, E. (in prep.) A revised classification of Plant Community Types for eastern New South Wales. NSW DPI, Parramatta;	



Plate 1. Representative photo of Zone 1: PCT 3269 Moderate (All Strata Present).



Plate 2. Representative photo of Zone 1: PCT 3269 Moderate (All Strata Present).



Plate 3. Representative photo of Zone 2: PCT326 Low (Reduced Canopy).



Plate 4. Representative photo of Zone 2: PCT326 Low (Reduced Canopy).

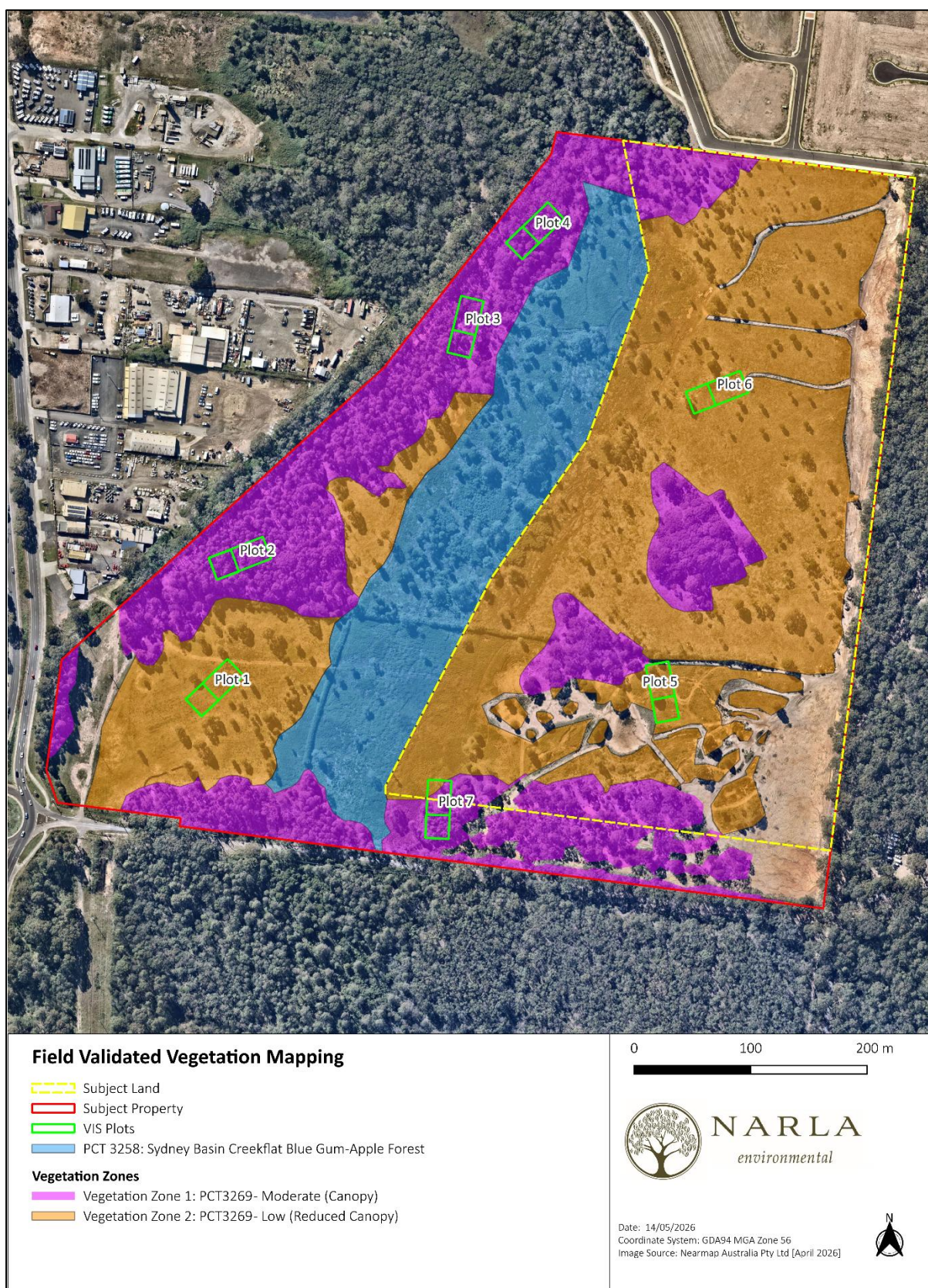


Figure 9. Narla field validated vegetation mapping and location of VIS plots within the Subject Land.

3.2 Threatened Ecological Communities

3.2.1 Biodiversity Conservation Act (BC Act) Listing

The vegetation within Vegetation Zone 1 and 2 contained characteristic species of the BC Act listed EEC Illawarra Lowlands Grassy Woodland in the Sydney Basin Bioregion (ILGW-SBB). The following species listed within the Final Determination (NSW Threatened Species Committee 2011) were identified within the Subject Property:

- *Acacia falcata*
- *Aristida vagans*
- *Commelina cyanea*
- *Cymbopogon refractus*
- *Desmodium varians*
- *Dichondra repens*
- *Echinopogon caespitosus*
- *Echinopogon ovatus*
- *Entolasia stricta*
- *Glycine sp.*
- *Goodenia hederacea subsp. hederacea*
- *Hypericum gramineum*
- *Melaleuca decora*
- *Melaleuca styphelioides*
- *Microlaena stipoides*
- *Oplismenus aemulus*
- *Oplismenus imbecillis*
- *Poa labillardieri*
- *Lobelia purpurascens*
- *Themeda australis*

ILGW-SBB occurs on relatively gently sloping to undulating lands less than about 200 m elevation on Berry Siltstone, Budgong Sandstone and Quaternary alluvium. Large areas of Illawarra Lowlands Grassy Woodland have been cleared. As the Subject Land occurs on a mostly flat landscape with an average elevation of 42m asl and is situated on the Nowra soil landscape, which is primarily characterized by medium- to coarse-grained quartz sandstones with scattered rounded pebbles throughout the beds, it is decided that this description matches that of the Subject Land.

3.2.2 Environmental Protection and Biodiversity Conservation Act (EPBC Act) Listing

The native vegetation identified within Vegetation Zone 1 and 2 is considered to meet the criteria for protection under the EPBC Act as the listed CEEC Illawarra and south coast lowland forest and woodland ecological community (ISCLFW) as this vegetation meets the minimum requirements for listing. In order to be considered a MNES under the EPBC Act, areas of the ecological community must meet the key diagnostic characteristics and at least the minimum condition thresholds for moderate condition (Cwth. Department of Environment and Energy 2016; **Table 4, Table 5**).

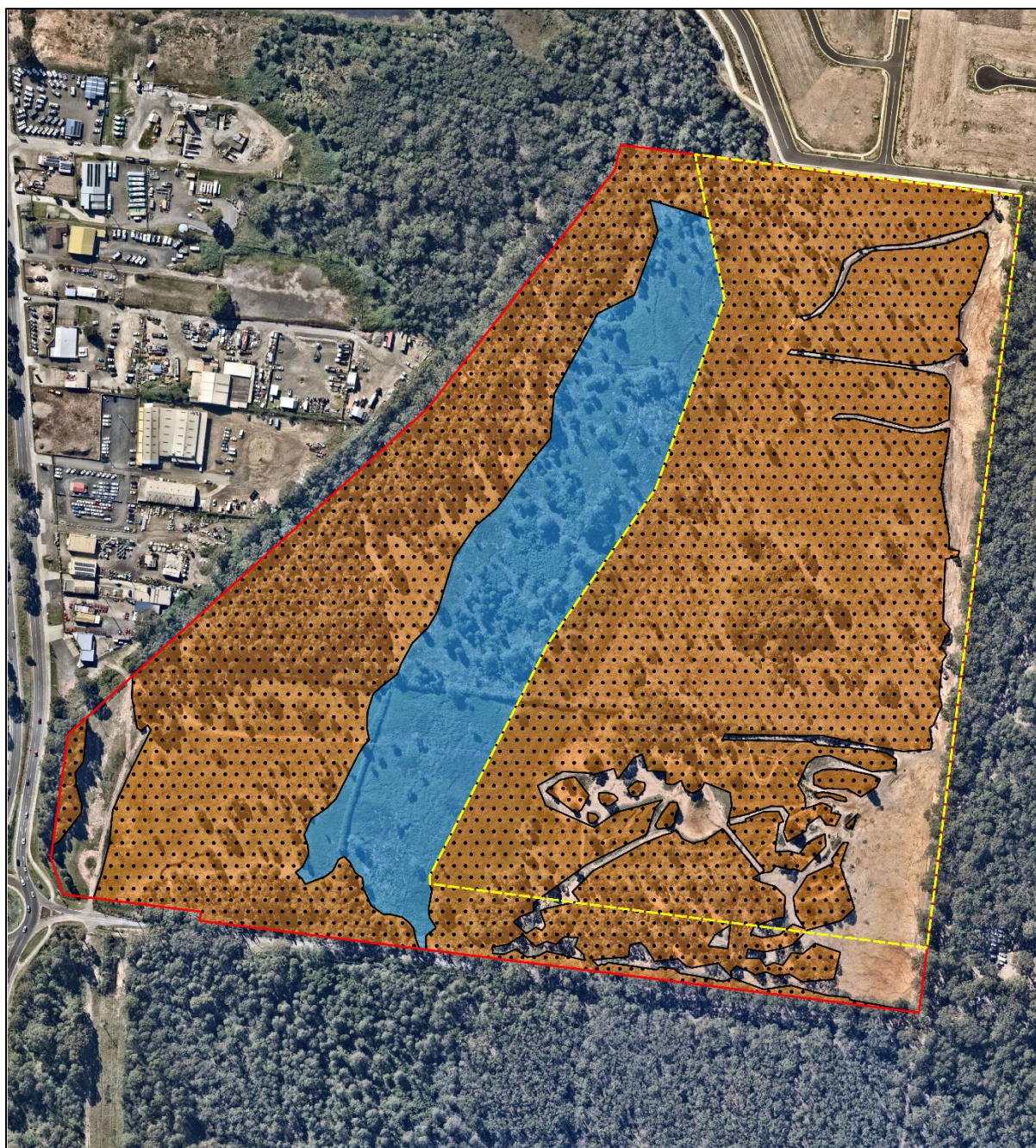
Table 4. Key Diagnostic Criteria for EPBC Act Listed ISCLFW.

Key diagnostic characteristics	Zone 1	Zone 2
The ecological community is located in New South Wales, particularly within the Jervis, Ettrema, and Illawarra subregions of the Sydney Basin Bioregion, and the Bateman subregion of the South East Corner Bioregion.	Yes	Yes
The ecological community is found below approximately 350 meters above sea level, situated on the coastal plain or foothills that lie between the immediate coastal strip and the escarpment.	Yes	Yes
The ecological community is characterized as a forest or woodland, having a minimum of 10% foliage cover.	Yes	Yes – while canopy is reduced, total cover meets

		minimum of 10%
<i>Eucalyptus tereticornis</i> (forest red gum) or <i>E. longifolia</i> (woollybutt) is typically present and often dominant in the mature tree canopy. One or more of the following canopy species may also be dominant, especially where there has been selective removal of trees from some patches of the ecological community: <i>Angophora floribunda</i> (rough-barked apple); <i>E. bosistoana</i> (coast grey box); <i>E. eugenioides</i> (thin-leaved stringybark); <i>E. globoidea</i> (white stringybark). Amongst the other tree species commonly found in the ecological community, but not typically dominant, are: <i>Corymbia maculata</i> (spotted gum); <i>E. amplifolia</i> subsp. <i>amplifolia</i> (cabbage gum); <i>E. botryoides</i> (bangalay); <i>E. paniculata</i> subsp. <i>paniculata</i> (grey ironbark); <i>E. pilularis</i> (blackbutt); and <i>E. quadrangulata</i> (coastal white box).	Yes – though dominated by <i>E. globoidea</i> , <i>Corymbia maculata</i> , <i>E. paniculata</i> .	Where present, dominated by <i>E. globoidea</i> , <i>Corymbia maculata</i> , <i>E. tereticornis</i> .
The ecological community is characterised by the plant species described in Appendix A of the listing advice. Not all species are present at each site.	Yes	Yes
The ecological community may encompass drainage lines and areas that are periodically inundated. However, it is typically found in locations that are less prone to regular or long-term inundation compared to two nearby ecological communities: 'River-flat eucalypt forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions' (NSW Scientific Committee, 2004a) and 'Swamp sclerophyll forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions' (NSW Scientific Committee, 2004b).	Yes	Yes
A sub-canopy may include <i>Melaleuca decora</i> (paper bark), <i>M. ericifolia</i> (swamp paper bark), <i>M. styphelioides</i> (prickly-leaved tea tree), tree-sized <i>Acacias</i> , and/or <i>Casuarina glauca</i> (swamp oak).	Yes	Yes
The ecological community is found on a diverse range of substrates, predominantly fine-grained sedimentary or plutonic rocks. These substrates give rise to sandy loam, loam, and clay loam soils with moderately high fertility. This community does not usually establish on infertile sandy soils or primary alluvium. While it can be present on basic volcanic soils, in the northern part of its range, such soils more commonly support different ecological communities.	Yes	Yes
The ecological community is less likely to be present in areas where there is a dominance by rainforest-associated plant species, particularly palms or tree ferns.	NA – there is no dominance of rainforest-associated plant species.	NA – there is no dominance of rainforest-associated plant species.

Table 5. Condition Thresholds for EPBC Act Protection (ISCLFW).

Category and rationale	Patch size thresholds	Biotic thresholds			Zone 1	Zone 2
High condition class: A larger patch with good quality native understorey and/or many very large trees	The patch is at least 2 ha.	50% of its total understorey vegetation cover* is comprised of native species (exotic annuals are excluded from this assessment) AND			Yes – patch is at least 2ha and at least 6 native understorey species are present per 0.5 ha	Yes – patch is at least 2ha and at least 6 native understorey species are present per 0.5 ha
		At least 6 native plant species per 0.5 ha in the ground layer	OR	the patch has at least ten trees that are either very large (at least 60cm diameter at breast height (dbh) or have hollows.		



Threatened Ecological Communities

- Subject Land
- Subject Property
- BC Act Illawarra Lowlands Grassy Woodland in the Sydney Basin Bioregion
- EPBC Act Illawarra and South Coast Lowland Forest and Woodland
- BC Act River-flat Eucalypt Forest on Coastal Floodplains of the NSW Bioregions

0 100 200 m



NARLA
environmental

Date: 14/05/2026
Coordinate System: GDA94 MGA Zone 56
Image Source: Nearmap Australia Pty Ltd [April 2026]



3.3 Assessing Patch Size

As defined by the BAM, a patch is an area of native vegetation that occurs on the Subject Land and includes native vegetation that has a gap of less than 100m from the next area of native vegetation (or $\leq 30\text{m}$ for non-woody ecosystems). A patch may extend onto adjoining land. For each vegetation zone, the assessor must determine the patch size in hectares and assign it to one of the following classes:

- $<5\text{ha}$;
- $5 - <25\text{ha}$;
- $25 - <100\text{ha}$; or
- $\geq 100\text{ha}$.

The patch size class is used to assess habitat suitability on the Subject Land for threatened species. The assessor may assign more than one patch size class to the vegetation zone if both of the following apply:

- A vegetation zone comprises two or more discontinuous areas of native vegetation, and
- The areas of discontinuous native vegetation have more than one patch size class.

As areas outside of the Subject Property were not assessed as part of the scope of this assessment, the vegetation zones identified within the Subject Land were separated into the following categories to allow for aerial mapping of patch size within the broader area (**Figure 10**).

- Woody Ecosystems:
 - Vegetation Zone 1: PCT 3269 – Moderate (All Strata Present); and
 - Vegetation Zone 2: PCT 3269 – Low (Reduced Canopy).

Table 6. Patch size classes of each PCT and associated vegetation zones.

Plant Community Type	Category	Vegetation Zone	Patch Size Class
PCT 3269	Woody Ecosystems	Zones 1 and 2	$>100\text{ha}$

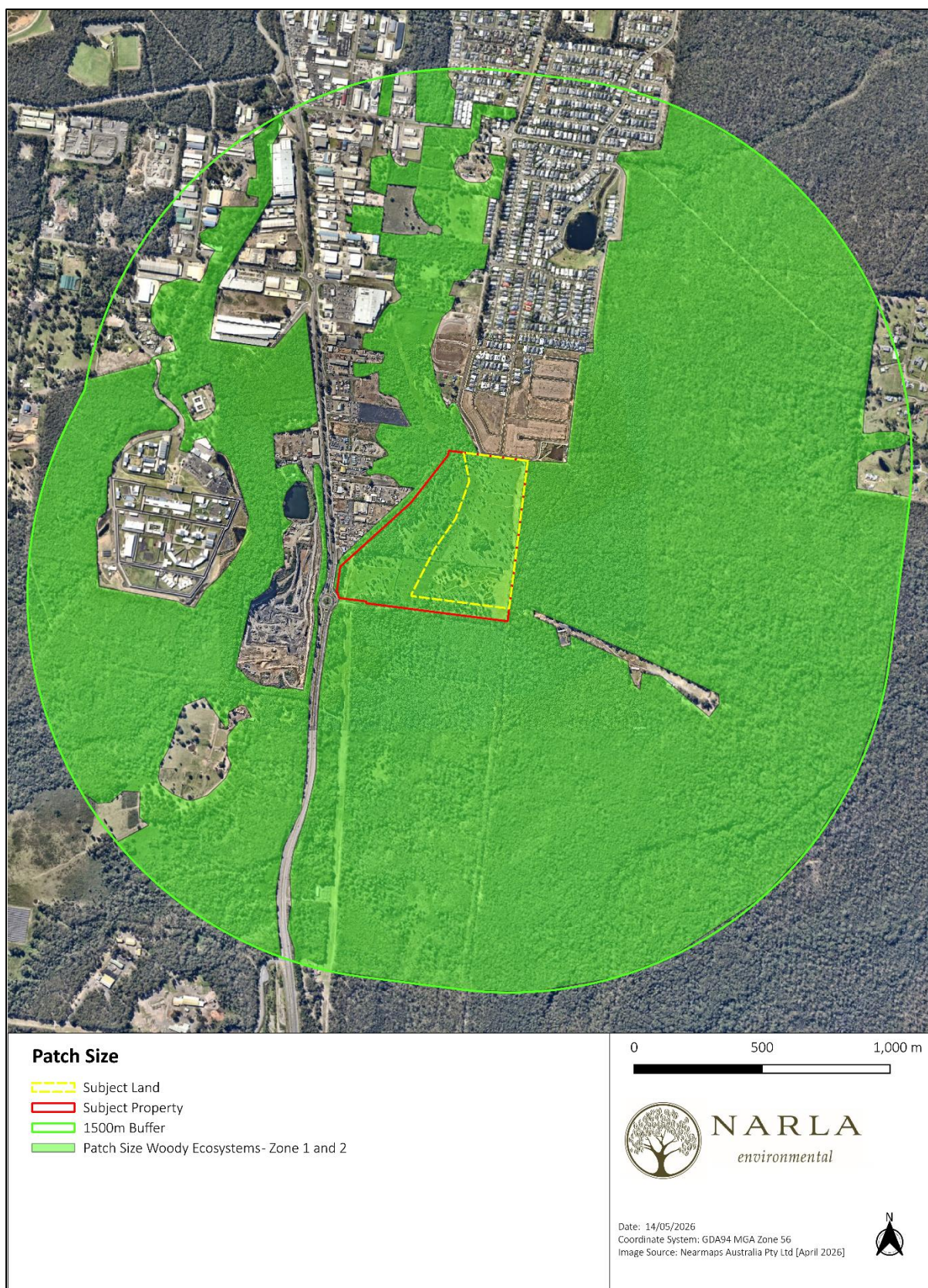


Figure 10. Patch size within the 1,500m buffer for each vegetation zone identified within the Subject Land.

3.4 Vegetation Integrity Survey (VIS) Plots

Seven (7) BAM VIS plots were established within the Subject Land. These plots were conducted to determine the vegetation integrity for each of the mapped native vegetation zones with data gathered for each attribute used to assess the function of the Subject Land vegetation. This data is detailed in **Appendix C**.

Vegetation Integrity (VI) Scores represented by existing vegetation within each vegetation zone is detailed in **Table 7**.

3.4.1 Determining Future Vegetation Integrity Scores

Most projects will result in complete clearing of vegetation and threatened species habitat within the project footprint. In this scenario, the assessor must assess the proposed future value of each of the VI attributes as zero in the BAMC. However, in circumstances where partial clearing of vegetation is proposed and remaining vegetation will be maintained, the assessor may determine that the future value of the relevant VI attributes is greater than zero (DPIE 2020a).

The Subject Land will experience complete clearing to facilitate the future works associated with the planning proposal. Therefore, all future conditions scores must be considered as zero. Consequently, the vegetation within the Subject Land has been assigned to the following management zones (**Figure 11**):

- Vegetation Zone 1: PCT 3269 – Moderate (All Strata Present):
 - Management Zone 1: PCT 3269 – Moderate – Complete Removal
- Vegetation Zone 2: PCT 3269 – Low (Reduced Canopy)
 - Management Zone 2: PCT 3269 – Low – Complete Removal

The attributes influencing future vegetation scores within each of these management zones are detailed in **Table 8**. Owing to the exotic nature of the vegetation mapped as Exotic Dominated Vegetation, they not been assigned to a management zone and will not require further assessment.

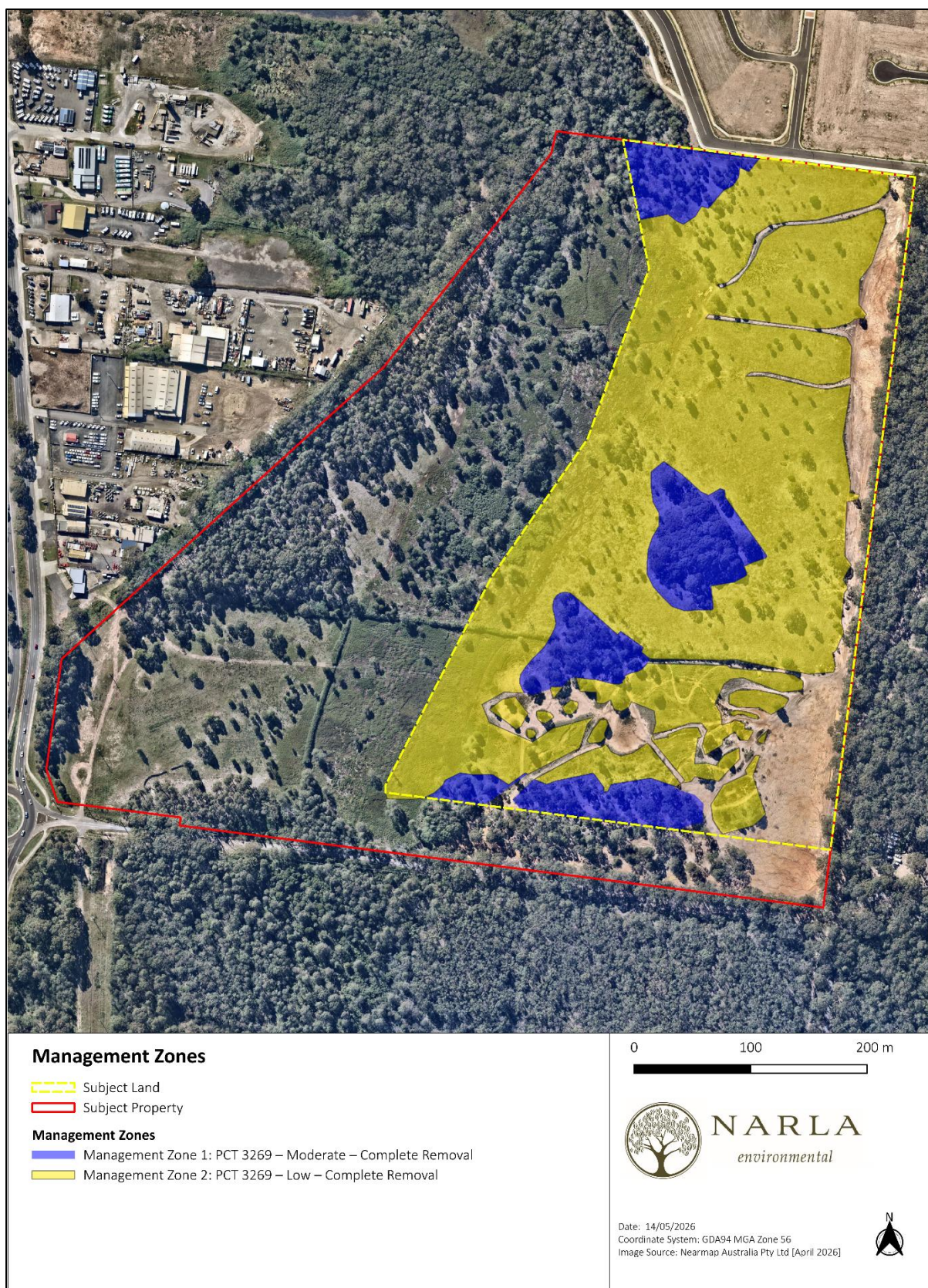


Figure 11. Management zones within the Subject Land.

Table 7. Vegetation integrity scores for each identified zone from the BAM C (DPE 2024f).

Vegetation Zone	Management Zone	Area (ha)	Survey Effort	Composition Condition Score	Structure Condition Score	Function Condition Score	VI Score	Future VI Score	Change in VI Score	Total VI Loss	Hollow bearing trees
Zone 1: PCT 3269 – Moderate (All Strata Present)	1 – Complete removal	2.45ha	Four (4) 1,000m ² (20mx50m) VIS Plots	28.1	46.4	45.1	38.9	0	-38.9	38.9	Yes
Zone 2: PCT 3269 – Low (Reduced Canopy)	2 – Complete removal	11.02ha	Three (3) 1,000m ² (20mx50m) VIS Plots	21.9	11.2	22.7	17.7	0	-17.7	17.7	No

Table 8. Management zones within the Subject Land and relevant vegetation attributes (composition, structure and function) affecting future VI scores.

Vegetation Zone	Management Zone	Changes in Current Vegetation Attributes	Vegetation Attributes Not Changed	Future Vegetation Scores and Justification
Zone 1: PCT 3269 – Moderate (All Strata Present)	1 – Complete removal	All vegetation will be removed	N/A	All vegetation within this zone requires removal as a result of the proposed planning proposal. Future composition, structure and function score is 0.
Zone 2: PCT 3269 – Low (Reduced Canopy)	2 – Complete removal	All vegetation will be removed	N/A	All vegetation within this zone requires removal as a result of the proposed planning proposal. Future composition, structure and function score is 0.

4. Threatened Species

4.1 Candidate Ecosystem Credit Species

Ecosystem credit species associated with the Subject Land are listed below in **Table 9**. No (0) species predicted by the BAM calculator as potential ecosystem credits were excluded from the assessment due to habitat constraints.

One (1) species, Australasian Bittern was manually added to the list as it has been previously recorded within the Subject Property.

Table 9. Candidate ecosystem credits predicted to occur within the Subject Land.

Scientific Name	BC Act Status	Sensitivity to Gain	Excluded from Assessment
<i>Anthochaera phrygia</i> Regent Honeyeater (Foraging)	Critically Endangered	High	No
<i>Artamus cyanopterus cyanopterus</i> Dusky Woodswallow	Vulnerable	Moderate	No
<i>Botaurus poiciloptilus</i> Australasian Bittern	Endangered	High	Added to the assessment
<i>Callocephalon fimbriatum</i> Gang-gang Cockatoo (Foraging)	Vulnerable	Moderate	No
<i>Calyptrorhynchus lathamii lathamii</i> South-eastern Glossy Black-Cockatoo (Foraging)	Vulnerable	High	No
<i>Daphoenositta chrysoptera</i> Varied Sittella	Vulnerable	Moderate	No
<i>Dasyurus maculatus</i> Spotted-tailed Quoll	Vulnerable	High	No
<i>Ephippiorhynchus asiaticus</i> Black-Necked Stork	Endangered	Moderate	No
<i>Falsistrellus tasmaniensis</i> Eastern False Pipistrelle	Vulnerable	High	No
<i>Gallinago hardwickii</i> Latham's Snipe	Vulnerable	High	No
<i>Haliaeetus leucogaster</i> White-bellied Sea-Eagle (Foraging)	Vulnerable	High	No
<i>Hieraaetus morphnoides</i> Little Eagle (Foraging)	Vulnerable	Moderate	No
<i>Hirundapus caudacutus</i> White-throated Needletail	Vulnerable	High	No
<i>Ixobrychus flavicollis</i> Black Bittern	Vulnerable	Moderate	No
<i>Lathamus discolor</i> Swift Parrot (Foraging)	Endangered	Moderate	No
<i>Lophoictinia isura</i> Square Tailed Kite (Foraging)	Vulnerable	Moderate	No

Scientific Name	BC Act Status	Sensitivity to Gain	Excluded from Assessment
<i>Miniopterus orianae oceanensis</i> Large Bent-winged Bat (Foraging)	Vulnerable	High	No
<i>Pachycephala olivacea</i> Olive Whistler	Vulnerable	Moderate	No
<i>Pandion cristatus</i> Eastern Osprey (Foraging)	Vulnerable	Moderate	No
<i>Parvipsitta pusilla</i> Little Lorikeet	Vulnerable	High	No
<i>Petaurus australis</i> Yellow-bellied Glider	Vulnerable	High	No
<i>Petroica phoenicea</i> Flame Robin	Vulnerable	Moderate	No
<i>Phoniscus papuensis</i> Golden-Tipped Bat	Vulnerable	High	No
<i>Pseudomys gracilicaudatus</i> Eastern Chestnut Mouse	Vulnerable	High	No
<i>Pseudomys novaehollandiae</i> New Holland Mouse	Vulnerable – EPBC Act Only	High	No
<i>Pteropus poliocephalus</i> Grey-headed Flying-fox (Foraging)	Vulnerable	High	No
<i>Saccolaimus flaviventris</i> Yellow-bellied Sheath-tail-bat	Vulnerable	High	No

4.2 Candidate Species Credit Species Summary

This section provides a summary of the candidate species credit for the Subject Land derived from BAMC (DPE 2024f). A summary of the targeted survey effort applied to each species is provided along with the results of the survey effort, specifically whether or not the species credit needs to be offset through retiring of Biodiversity Offset Credits (**Table 10**). Australian Bittern (*Botaurus poiciloptilus*) which was previously recorded within the Subject Property. This species is not a Candidate Credit Species and has been manually added to the Ecosystem Species within the BAMC.

Table 10. Candidate fauna credit species predicted to occur within the Subject Land.

Scientific Name	Included in Assessment?	Targeted Survey conducted?	Present within Subject Land?	Biodiversity Risk Weighting	Biodiversity Offset Credits Required?
<i>Anthochaera phrygia</i> Regent Honeyeater (Breeding)	No, the Subject Land is not included on the map of Important Areas for Regent Honeyeater. Therefore, this species was excluded from the assessment.	NA	NA	Very High – 3	No
<i>Callocephalon fimbriatum</i> Gang Gang Cockatoo (Breeding)	Yes. Habitat constraint for this species is Eucalypt tree species with hollows at least 3 m above the ground and with hollow diameter of 7 cm or larger. Zone 1 supports multiple hollows up to 15cm diameter. As such this species has been assumed present and included in the assessment.	No	Assumed Present	High – 2	Yes
<i>Calyptorhynchus lathami lathami</i> South-eastern Glossy Black Cockatoo (Breeding)	Yes. Habitat constraint for this species is living or dead tree with hollows greater than 15cm diameter and higher than 8m above ground. Zone 1 supports multiple hollows up to 15cm diameter. As such this species has been assumed present and included in the assessment.	No	Assumed Present	High – 2	Yes
<i>Cercartetus nanus</i> Eastern Pygmy Possum	Yes. This species is found in a broad range of habitats from rainforest through sclerophyll (including Box-Ironbark) forest and woodland to heath. They may occupy small patches of vegetation in fragmented landscapes and although the species prefers habitat with a rich shrub understory, they are known to occur in grassy woodlands and the presence of Eucalypts alone is sufficient to support populations in low densities. Shelters in tree hollows, rotten stumps, holes in the ground, abandoned bird-nests, Ringtail Possum	No	Assumed Present	High – 2	Yes

Scientific Name	Included in Assessment?	Targeted Survey conducted?	Present within Subject Land?	Biodiversity Risk Weighting	Biodiversity Offset Credits Required?
	<i>(Pseudocheirus peregrinus)</i> dreys or thickets of vegetation, (e.g. grass-tree skirts); nest-building appears to be restricted to breeding females; tree hollows are favoured but spherical nests have been found under the bark of eucalypts and in shredded bark in tree forks. Such habitat is present within Zone 1 and 2 and as such this species has been assumed present.				
<i>Chalinolobus dwyeri</i> Large-eared Pied Bat	No. Potential foraging habitat is vegetation within 2km of rocky areas containing caves, or overhangs or crevices, cliffs or escarpments, or old mines, tunnels, culverts, derelict concrete buildings. As such habitat constraints are not present within the Subject Land or within 2km of the Subject Land, this species was excluded from the assessment.	NA	NA	Very High – 3	No
<i>Haliaeetus leucogaster</i> White-Bellied Sea Eagle (Breeding)	Yes. Breeding habitat is live large old trees within 1km of a rivers, lakes, large dams or creeks, wetlands and coastlines AND the presence of a large stick nest within tree canopy; or an adult with nest material; or adults observed duetting within breeding period. No large stick nests, adults with nest material or adults all together were present within the Subject Land at the time of assessment. However, the survey was not conducted within the DPE approved survey periods, as such this species has been assumed present within Zone 1.	No	Assumed Present	High – 2	Yes
<i>Heleioporus australiacus</i> Giant Burrowing Frog	Yes. This species spends more than 95% of its time in non-breeding habitat in areas up to 300 m from breeding sites. Breeding habitat of this species is generally soaks or pools within first or second order streams. Such habitat is present within the Subject Land, as such this species has been assumed present.	No.	Assumed Present	Moderate – 1.5	Yes
<i>Hieraetus morphnoides</i> Little Eagle (Breeding)	Yes. Breeding habitat is live (occasionally dead) large old trees within suitable vegetation and the presence of a male and female; or any adult with nesting material; or an individual on a large stick nest in the top half of the tree canopy; or pairs displaying (soaring, diving, engaging in chases, or a male observed calling in flight with a female begging from tree). No nests or	No.	Assumed Present	Moderate – 1.5	Yes

Scientific Name	Included in Assessment?	Targeted Survey conducted?	Present within Subject Land?	Biodiversity Risk Weighting	Biodiversity Offset Credits Required?
	<i>Hieraaetus morphnoides</i> were identified within the Subject Land. However, the survey was not conducted within the DPE approved survey periods, as such this species has been assumed present within Zone 1.				
<i>Isodon obesulus</i> obesulus Southern Brown Bandicoot	Yes. Habitat constraint is dense ground cover in a variety of habitats. Such habitat is present within Zone 1 and 2 and as such this species has been assumed present.	NA	Assumed Present	High – 2	Yes
<i>Lathamus discolour</i> Swift Parrot (Breeding)	No, the Subject Land is not included on the map of Important Areas for Swift Parrot. Therefore, this species was excluded from the assessment.	NA	NA	Very High – 3	No
<i>Litoria aurea</i> Green and Golden Bell Frog	Yes. Habitat constraint for this species is any area is within 1km of wet areas. Such habitat is present within the Subject Land and as such this species has been assumed present.	No	Assumed Present	High – 2	Yes
<i>Lophoictinia isura</i> Square-Tailed Kite (Breeding)	Yes. Breeding habitat is live large old trees within suitable vegetation AND the presence of a male and female; or female with nesting material; or an individual on a large stick nest in the top half of the tree canopy. No large stick nests, adults with nest material or adults in general were present within the Subject Land at the time of assessment. However, the survey was not conducted within the DPE approved survey periods, as such this species has been assumed present within Zone 1.	No.	Assumed Present	Moderate – 1.5	Yes
<i>Miniopterus orianae oceanensis</i> Large Bent-winged Bat (Breeding)	No. This species is known to breed in caves, tunnels, mines and culverts. No caves, tunnels, mines or culverts exist within the Subject Land. As such, this species was excluded from the assessment.	NA	NA	Very High – 3	No
<i>Mixophyes balbus</i> Stuttering Frog	No. This species is found in rainforest and wet, tall open forest in the foothills and escarpment on the eastern side of the Great Dividing Range. No such habitat was present within the Subject Land which makes the presence of	NA	NA	Very High - 3	No

Scientific Name	Included in Assessment?	Targeted Survey conducted?	Present within Subject Land?	Biodiversity Risk Weighting	Biodiversity Offset Credits Required?
	this species highly unlikely. As such, it has been excluded from the assessment.				
<i>Myotis macropus</i> Southern Myotis	Yes. Habitat constraint for this species waterbodies with permanent pools/stretches 3m or wider, including rivers, large creeks, billabongs, lagoons, estuaries, dams and other waterbodies, on or within 200m of the site. Such habitat is present within 200m of the Subject Land and as such this species has been assumed present.	No	Assumed Present	High – 2	Yes
<i>Ninox connivens</i> Barking Owl	No. Habitat constraint for this species is a living or dead tree with a hollow >20 cm diameter that occurs >4 metres above the ground. No hollows of a suitable size were identified within the Subject Land. Therefore, this species was excluded from the assessment	NA	NA	High – 2	No
<i>Ninox strenua</i> Powerful Owl	No. Habitat constraint is a living or dead tree with a hollow >20 cm diameter that occurs >4 metres above the ground. No hollows of a suitable size were identified within the Subject Land. Therefore, this species was excluded from the assessment.	NA	NA	High – 2	No
<i>Pandion cristatus</i> Eastern Osprey (Breeding)	Yes. Habitat constraint is for this species is the presence of stick-nests in living and dead trees (>15m) or artificial structures within 100m of a floodplain for nesting. No stick nests or artificial structures within 100m of a floodplain are within the Subject Land. However, the survey was not conducted within the DPE approved survey periods, as such this species has been assumed present within Zone 1.	No.	Assumed Present	Moderate – 1.5	Yes
<i>Petauroides volans</i> Greater Glider	Yes. This species shelters during the day in tree hollows and will use up to 18 hollows in their home range. As hollow bearing trees are present within Zone 1, this species has been assumed present.	No	Assumed Present	High – 2	Yes
<i>Petaurus norfolcensis</i> Squirrel Glider	Yes. This species relies on large old trees with hollows for breeding and nesting. As hollow bearing trees are present within Zone 1, this species has been assumed present.	No	Assumed Present	High – 2	Yes

Scientific Name	Included in Assessment?	Targeted Survey conducted?	Present within Subject Land?	Biodiversity Risk Weighting	Biodiversity Offset Credits Required?
<i>Petrogale penicillata</i> Brush-tailed Rock-wallaby	No. Habitat constraint for this species is land within 1 km of rocky escarpments, gorges, steep slopes, boulder piles, rock outcrops or cliffines. As such habitat constraints are not present within or within 1km of the Subject Land, this species was excluded from the assessment.	NA	NA	Very High - 3	No
<i>Phascogale tapoatafa</i> Brush-tailed phascogale	Yes. This species is associated with a wide range of PCTs across NSW and may occur in habitat without any hollow-bearing trees. However, hollow bearing trees are not a habitat constraint for this species. Generally, nest and shelter in tree hollows with entrances 2.5- 4 cm wide and use many different hollows over a short time span. Such habitat is present within the Subject Land and as such this species has been assumed present.	No	Assumed Present	High – 2	Yes
<i>Phascolarctos cinereus</i> Koala	Yes. Koala use trees are present within the Subject Land. As such, this species has been assumed present.	No	Assumed Present	High – 2	Yes
<i>Pteropus poliocephalus</i> Grey-Headed Flying Fox	No. No breeding camps are present within the Subject Site. Therefore, this species was excluded from the assessment.	NA	NA	High – 2	No
<i>Sminthopsis leucopus</i> White-footed Dunnart	Yes. This species is found in a range of different habitats across its distribution, including coastal dune vegetation, coastal forest, tussock grassland and sedgeland, heathland, woodland and forest. As such, this species has been assumed present.	No	Assumed Present	High – 2	Yes
<i>Tyto novaehollandiae</i> Masked Owl	No. Habitat constraint for this species is a living or dead tree with a hollow >20 cm diameter that occurs >4 metres above the ground. No hollows of a suitable size were identified within the Subject Land. Therefore, this species was excluded from the assessment.	NA	NA	High – 2	No

Table 11. Candidate flora credit species predicted to occur within the Subject Land.

Scientific Name	Included in Assessment?	Targeted Survey conducted?	Present within Subject Land?	Biodiversity Risk Weighting	Biodiversity Offset Credits Required?
<i>Acacia pubescens</i> Downy Wattle	Yes. This species occurs on alluviums, shales and at the intergrade between shales and sandstones. The soils are characteristically gravelly soils, often with ironstone. Targeted survey was conducted during DPE approved survey period (all year round) and no individuals found.	Yes	No	High-2	No
<i>Cryptostylis hunteriana</i> Leafless Tongue Orchid	Yes. This species does not appear to have well defined habitat preferences and is known from a range of communities, including swamp-heath and woodland. Survey was conducted outside of approved survey period (November-December), as such this species is assumed present.	Yes	Assumed Present	Moderate – 1.5	Yes
<i>Pterostylis vernalis</i>	No. This species requires moss gardens in shallow soil over sandstone sheets or moss gardens on heavy laterite associated soils, in heath and dry heathy forest/woodland. No such habitat is present within the Subject Land, as such this species has been excluded from assessment.	NA	NA	Very High – 3	No
<i>Rhodamnia rubescens</i> Scrub Turpentine	Yes. Found in littoral, warm temperate and subtropical rainforest, and wet sclerophyll forest usually on volcanic and sedimentary soils. Targeted survey was conducted during DPE approved survey period (all year round) and no individuals were recorded.	Yes	No	Very High – 3	No
<i>Triplarina nowraensis</i> Nowra Heath Myrtle	Yes. This species occurs on poorly drained, gently sloping sandstone shelves or along creek lines underlain by Nowra Sandstone. The sites are often either treeless or have a very open tree canopy due to the impeded drainage. Targeted survey was conducted during DPE approved survey period (all year round) and no individuals found within the Subject Land.	Yes	No	High-- 2	No

4.3 Species Credit Surveys

Surveys for species credit species and their habitats were undertaken for species considered likely to have suitable habitat within the Subject Land (**Figure 12**). These surveys were conducted in accordance with Section 5.3 of the BAM and all relevant OEH and DPE threatened species survey guidelines.

Targeted surveys were undertaken on the 8th May 2024 by experienced Narla Ecologists Gemma Hicks, Phil Maxwell and Brodie Miller, within the Subject Land and the areas adjacent. Weather conditions taken from the nearest weather station (Nowra RAN Air Station, station no. 068072) in the lead up and during the field survey are outlined in **Table 12**.

Large amounts rainfall leading up to the site assessment made large sections of the Subject Land difficult or impossible to access due to flooding and therefore the extent of the targeted searches was limited. In addition, this rainfall may not have been conducive for the survey of threatened flora should they occur within the Subject Land.

Table 12. Weather conditions taken from the nearest weather stations (Station number 068072) in the lead up and during the field survey (BOM 2024). Survey date is in bold.

Timing/activities	Date	Temperature		Rainfall (mm)
		Min	Max	
Lead up to the survey	1/05/2024	11.2	18.7	0
	2/05/2024	11.9	16.5	4.2
	3/05/2024	12.6	18.3	12.6
	4/05/2024	12.1	17.2	2.4
	5/05/2024	13.5	15.5	59.2
	6/05/2024	13	18.9	16.8
	7/05/2024	11.2	18.1	5.6
Site Assessment & Habitat Survey	8/05/2024	13.5	17.7	1.8

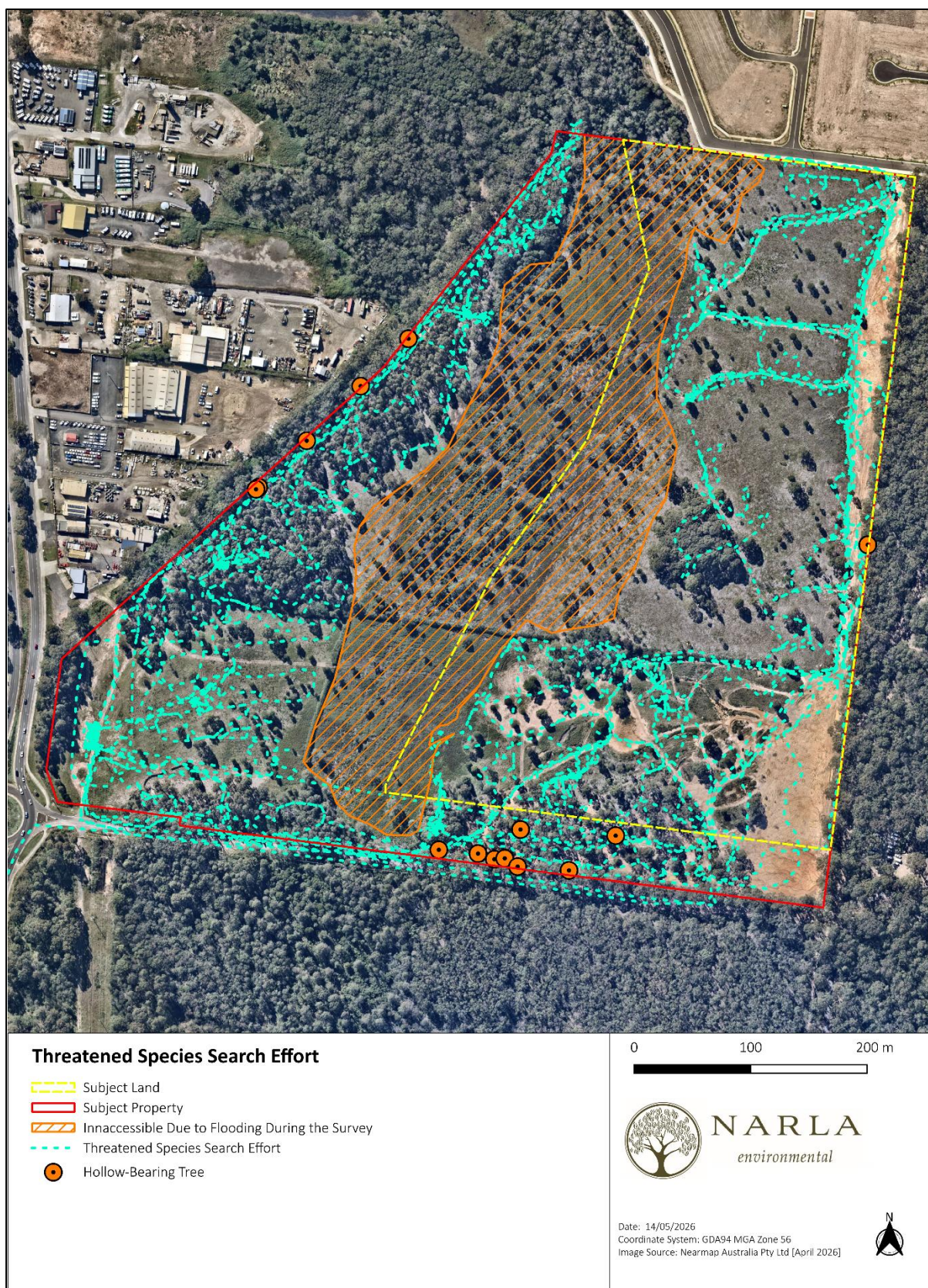


Figure 12. Targeted survey effort for threatened species and their habitats.

4.3.1 Fauna Species Credit Survey

Twenty-six (26) threatened fauna species were identified within the BAMC (NDCCEEW 2026f) as having the potential to occur within the Subject Land. Ten (10) predicted species were not surveyed for due to the following (BAM Section 5.2.2, DPIE 2020a):

- The assessor determines that none of the habitat constraints for the species are present in a vegetation zone. No further assessment is required for that species in that vegetation zone. The assessor must record their reasoning for this determination in the BCAR; or
- The assessor determines that none of the habitat constraints for the species are present on the entire Subject Land. No further assessment is required for that species. The assessor must record their reasoning for this determination in the BCAR.

Sixteen (16) species were assumed present as suitable targeted surveys have not yet been conducted during DPE endorsed survey periods or using DPE endorsed methodology (**Table 13**) at the time of writing this report:

- *Callocephalon fimbriatum* (Gang Gang Cockatoo);
- *Calyptorhynchus lathami lathami* (South-eastern Glossy Black Cockatoo);
- *Cercartetus nanus* (Eastern Pygmy Possum);
- *Hieraaetus morphnoides* (Little Eagle);
- *Lophoictinia isura* (Square-Tailed Kite);
- *Haliaeetus leucogaster* (White-Bellied Sea Eagle);
- *Heleioporus australiacus* (Giant Burrowing Frog);
- *Isoodon obesulus obesulus* (Southern Brown Bandicoot)
- *Litoria aurea* (Green and Golden Bell Frog);
- *Myotis macropus* (Southern Myotis);
- *Pandion cristatus* (Eastern Osprey);
- *Petauroides volans* (Greater Glider);
- *Petaurus norfolcensis* (Squirrel Glider);
- *Phascogale tapoatafa* (Brush-tailed Phascogale);
- *Phascolarctos cinereus* (Koala); and
- *Sminthopsis leucopus* (White-footed Dunnart).

Table 13. Species credit fauna species requiring targeted surveys and DPE endorsed survey periods.

Candidate Fauna Species	Survey Period (BAMC)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<i>Callocephalon fimbriatum</i> Gang-gang Cockatoo (Breeding) Assumed Present					✓							
<i>Calyptorhynchus lathami lathami</i> South-eastern Glossy Black Cockatoo (Breeding) Assumed Present					✓							
<i>Cercartetus nanus</i> Eastern Pygmy Possum Assumed Present					✓							
<i>Haliaeetus leucogaster</i>					✓							

Candidate Fauna Species	Survey Period (BAMC)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
White-Bellied Sea Eagle (Breeding) Assumed present												
<i>Heleioporus australiacus</i> Giant Burrowing Frog Assumed Present					✓							
<i>Hieraaetus morphnoides</i> Little Eagle (Breeding) Assumed Present					✓							
<i>Isodon obesulus obesulus</i> Southern Brown Bandicoot Assumed Present					✓							
<i>Litoria aurea</i> Green and Golden Bell Frog Assumed Present					✓							
<i>Lophoictinia isura</i> Square-tailed Kite (Breeding) Assumed Present					✓							
<i>Myotis macropus</i> Southern Myotis Assumed Present					✓							
<i>Pandion cristatus</i> Eastern Osprey Assumed Present					✓							
<i>Petauroides volans</i> Southern Greater Glider Assumed Present					✓							
<i>Petaurus norfolcensis</i> Squirrel Glider Assumed Present					✓							
<i>Phascogale tapoatafa</i> Brush-tailed phascogale Assumed Present					✓							
<i>Phascolarctos cinereus</i> Koala Assumed Present					✓							
<i>Sminthopsis leucopus</i> White-footed Dunnart					✓							

Candidate Fauna Species	Survey Period (BAMC)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Assumed Present												
Key	✓ = Time of Site Assessment						= DPE Endorsed Survey Period					

4.3.2 Flora Species Credit Survey

Five (5) threatened flora species were identified within the BAMC (NDCCEEW 2026f) as having the potential to occur within the Subject Land. One (1) predicted species was not surveyed for due to the following (BAM Section 5.2.2, DPIE 2020a):

- The assessor determines that none of the habitat constraints for the species are present in a vegetation zone. No further assessment is required for that species in that vegetation zone. The assessor must record their reasoning for this determination in the BCAR; or
- The assessor determines that none of the habitat constraints for the species are present on the entire Subject Land. No further assessment is required for that species. The assessor must record their reasoning for this determination in the BCAR.

Targeted surveys were conducted for three (3) species in accordance with the “Surveying Threatened Plants and Their Habitats: NSW survey guide for the Biodiversity Assessment Method” (DPIE 2020a).

One (1) species was assumed present, as suitable targeted surveys had not yet been conducted during the DPE endorsed survey periods and the Subject Land was too flooded to survey in its entirety (**Table 14**) at the time of writing this report.

Table 14. DPE endorsed survey period for species credit flora species.

Candidate Fauna Species	Survey Period (BAMC)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<i>Acacia pubescens</i> Downy Wattle					✓							
<i>Cryptostylis hunteriana</i> Leafless Tongue Orchid Assumed Present					✓							
<i>Rhodamnia rubescens</i> Scrub Turpentine					✓							
<i>Triplarina nowraensis</i> Nowra Heath Myrtle					✓							
Key	✓ = Time of Site Assessment						= DPE Endorsed Survey Period					

4.4 Species Polygons

Seventeen (17) threatened species have been assumed present that may be impacted by the proposed development, as suitable surveys have not yet been conducted within the DPE endorsed survey period at the time of writing this report.

According to the BAM (DPIE 2020a), where a species has been confirmed or is assumed to be present on the Subject Land, the assessor may use:

- An expert report to determine the location and area of the species polygon. The expert report must be used to identify the area of habitat for the species, or for species assessed by count, to identify the likely location and estimated number of individuals; or
- The area supporting the habitat constraints relevant to the species in the vegetation zone(s) (e.g., small rocky outcrops) as the species polygon for species assessed by area;
- For species who have mapped areas of “Important Habitat” that intersect the Subject Land, the species polygon must include the entire area mapped on the “Important Habitat” map that occurs within the Subject Land and intersects suitable habitat. or
- The entire vegetation zone(s) the species is predicted to occur within as the species polygon for species assessed by area.

The threatened species assumed to be present within the Subject Land have had the following species polygons assigned to them as outlined in **Table 15**.

Table 15. Threatened species polygons and requirements.

Threatened Species	Species Polygon Requirements	Vegetation Zones included in Species Polygon
<i>Callocephalon fimbriatum</i> (Gang Gang Cockatoo)	All suitable vegetation within 200m from the identified or suitable nest trees (DPE 2024)	Radius encompasses all of Zone 1 (Zone 2 excluded owing to lack of suitable hollows for this species; Figure 13).
<i>Calyptorhynchus lathami lathami</i> South-eastern Glossy Black Cockatoo	All suitable vegetation within 200m from the identified or suitable nest trees (DPE 2024)	Radius encompasses all of Zone 1 (Zone 2 excluded owing to lack of suitable hollows for this species; Figure 13).
<i>Cercartetus nanus</i> (Eastern Pygmy Possum)	The entire vegetation zone(s) the species is predicted to occur within as the species polygon for species assessed by area.	All of Zone 1 and 2 (Figure 17).
<i>Cryptostylis hunteriana</i> (Leafless Tongue Orchid)	The entire vegetation zone(s) the species is predicted to occur within as the species polygon for species assessed by area.	All of Zone 1 and 2 (Figure 17).
<i>Haliaeetus leucogaster</i> (White-Bellied Sea Eagle)	All suitable vegetation within 250m from the identified or suitable nest trees (DPE 2024)	Radius encompasses all of Zone 1 (Zone 2 excluded owing to lack of suitable nest trees for this species; Figure 13).
<i>Heleioporus australiacus</i> (Giant Burrowing Frog)	300m radius from top of bank of suitable habitat (DPIE 2020c). However, given the sites proclivity to flooding a precautionary approach was used.	Areas of Zones 1 and 2 (Figure 15).

Threatened Species	Species Polygon Requirements	Vegetation Zones included in Species Polygon
<i>Hieraetus morphnoides</i> (Little Eagle)	All suitable vegetation within 300m from the identified or suitable nest trees (DPE 2024)	Radius encompasses all of Zone 1 (Zone 2 excluded owing to lack of suitable nest trees for this species; Figure 13).
<i>Isoodon obesulus obesulus</i> Southern Brown Bandicoot	The entire vegetation zone(s) the species is predicted to occur within as the species polygon for species assessed by area.	All of Zone 1 and 2 (Figure 17).
<i>Litoria aurea</i> (Green and Golden Bell Frog)	200m radius from the top of bank of suitable habitat (DPIE 2020c). However, given the sites proclivity to flooding a precautionary approach was used	Areas of Zones 1 and 2 (Figure 16).
<i>Lophoictinia isura</i> (Square-Tailed Kite)	All suitable vegetation within 300m from the identified or suitable nest trees (DPE 2024)	Radius encompasses all of Zone 1 (Zone 2 excluded owing to lack of suitable nest trees for this species; Figure 13).
<i>Myotis macropus</i> (Southern Myotis)	All native vegetation located within a 200m buffer suitable waterbodies located within and in close proximity to the Subject Land (OEH 2018). However, given the sites proclivity to flooding a precautionary approach was used.	Areas of Zones 1 and 2 (Figure 16).
<i>Pandion cristatus</i> (Eastern Osprey)	All suitable vegetation within 100m from the identified or suitable nest trees (DPE 2024)	Radius encompasses all of Zone 1 (Zone 2 excluded owing to lack of suitable nest trees for this species; Figure 13).
<i>Petauroides volans</i> (Southern Greater Glider)	The entire vegetation zone(s) the species is predicted to occur within as the species polygon for species assessed by area.	Zones 1 (Zone 2 excluded owing to lack of suitable hollows for this species; Figure 14).
<i>Petaurus norfolcensis</i> (Squirrel Glider)	The entire vegetation zone(s) the species is predicted to occur within as the species polygon for species assessed by area.	Zones 1 (Zone 2 excluded owing to lack of suitable hollows for this species; Figure 14).
<i>Phascogale tapoatafa</i> (Brush-tailed phascogale)	The entire vegetation zone(s) the species is predicted to occur within as the species polygon for species assessed by area.	All of Zone 1 and 2 (Figure 17).
<i>Phascolarctos cinereus</i> (Koala)	The entire vegetation zone(s) the species is predicted to occur within as the species polygon for species assessed by area.	Zones 1 (Zone 2 excluded owing to lack of suitable trees for this species; Figure 14).
<i>Sminthopsis leucopus</i> White-footed Dunnart	The entire vegetation zone(s) the species is predicted to occur within as the species polygon for species assessed by area.	All of Zone 1 and 2 (Figure 17).

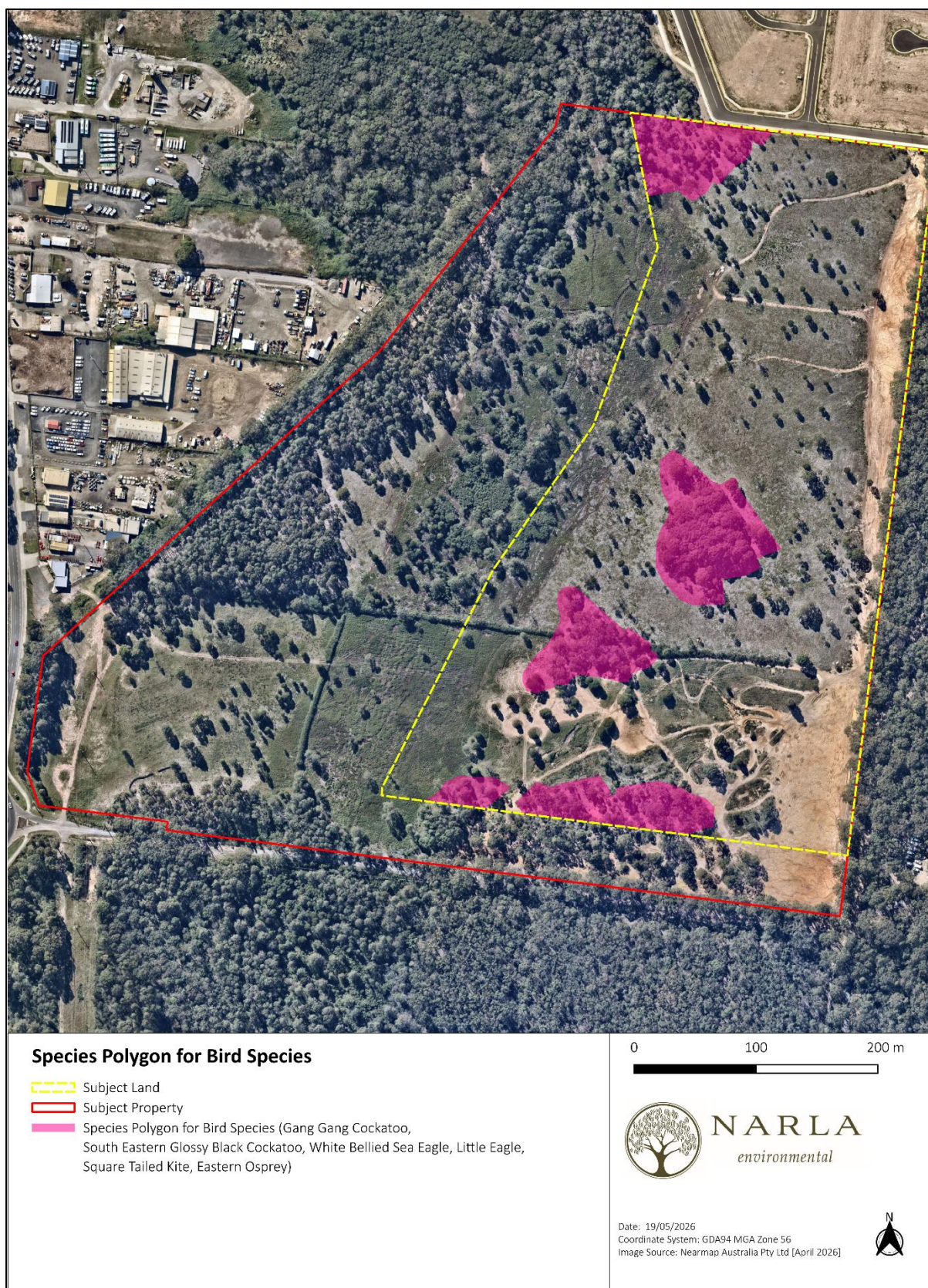


Figure 13. Species polygon for the assumed present bird species.

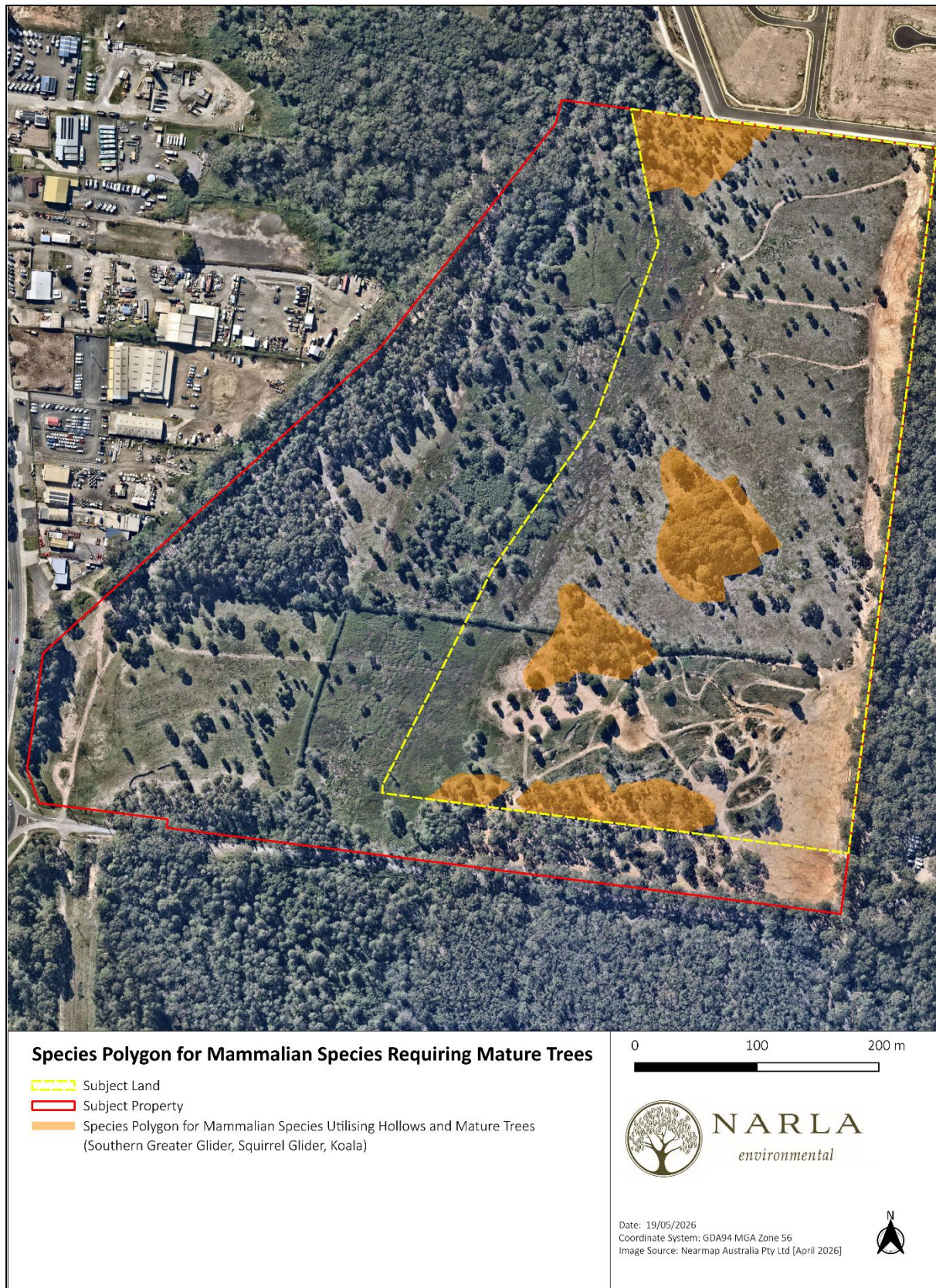


Figure 14. Species polygon for mammalian species requiring hollows that were assumed present.

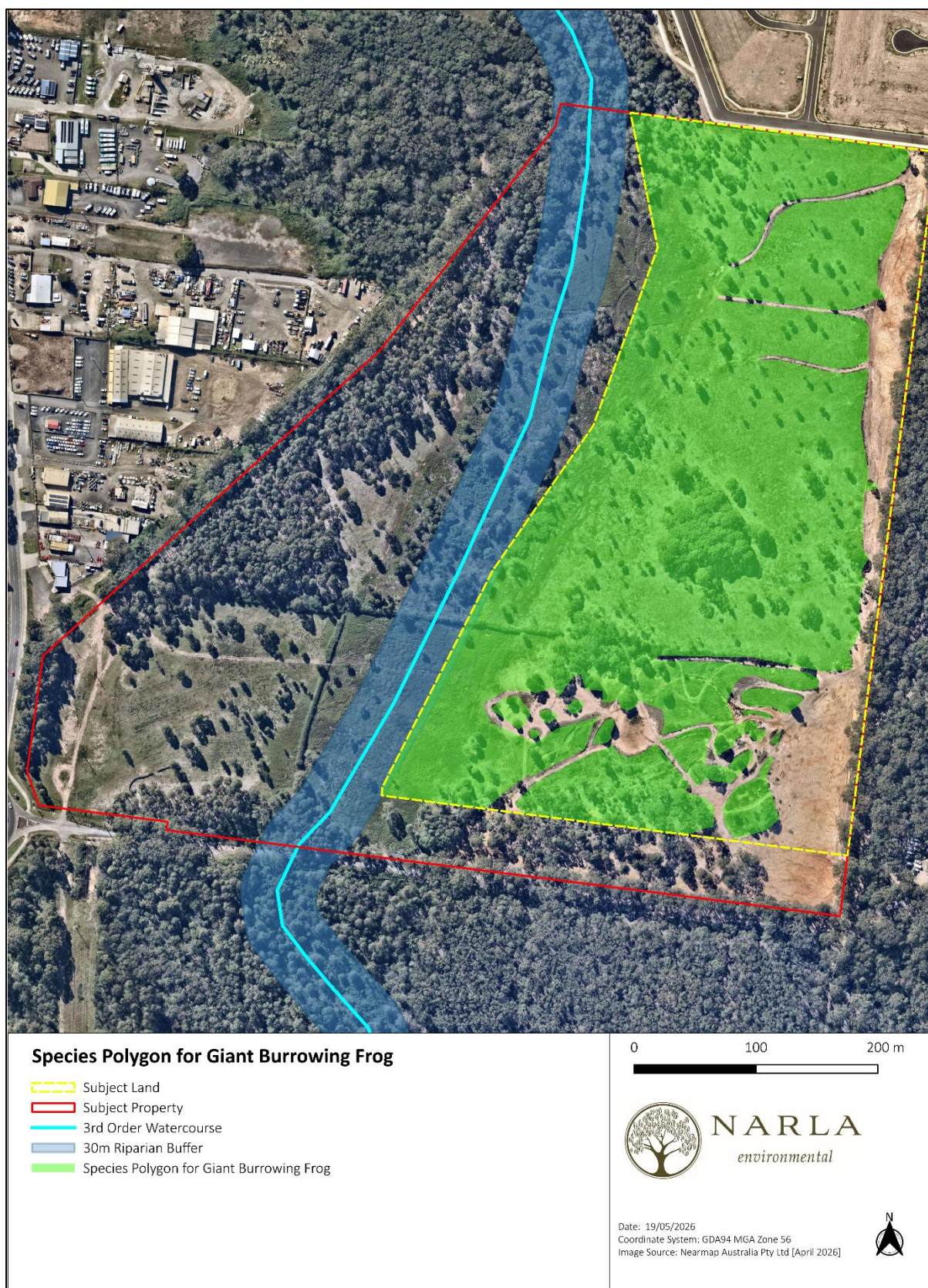


Figure 15. Species polygon for the assumed present Giant Burrowing Frog.

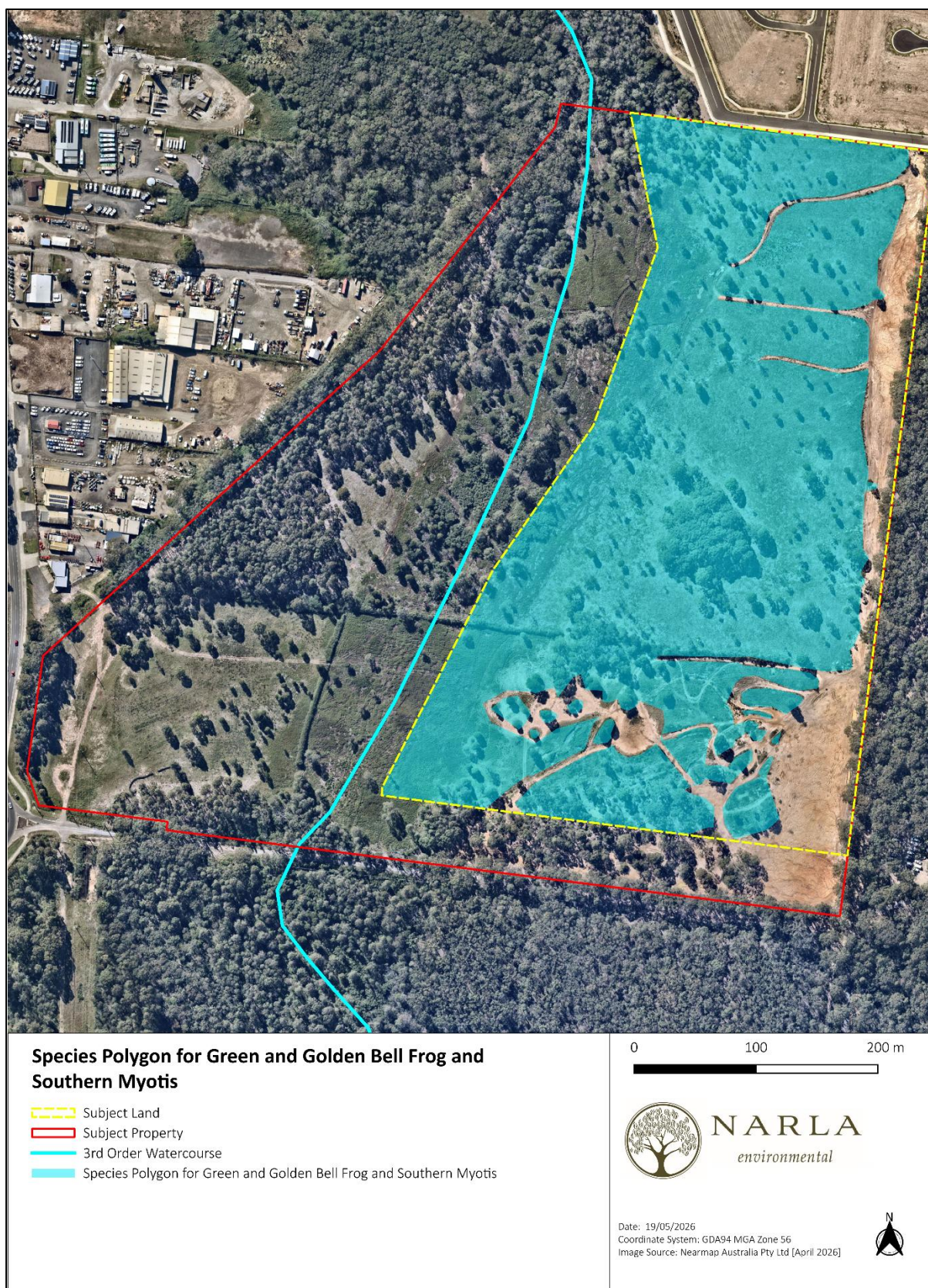


Figure 16. Species polygon for the assumed present Green and Golden Bell Frog and Southern Myotis.

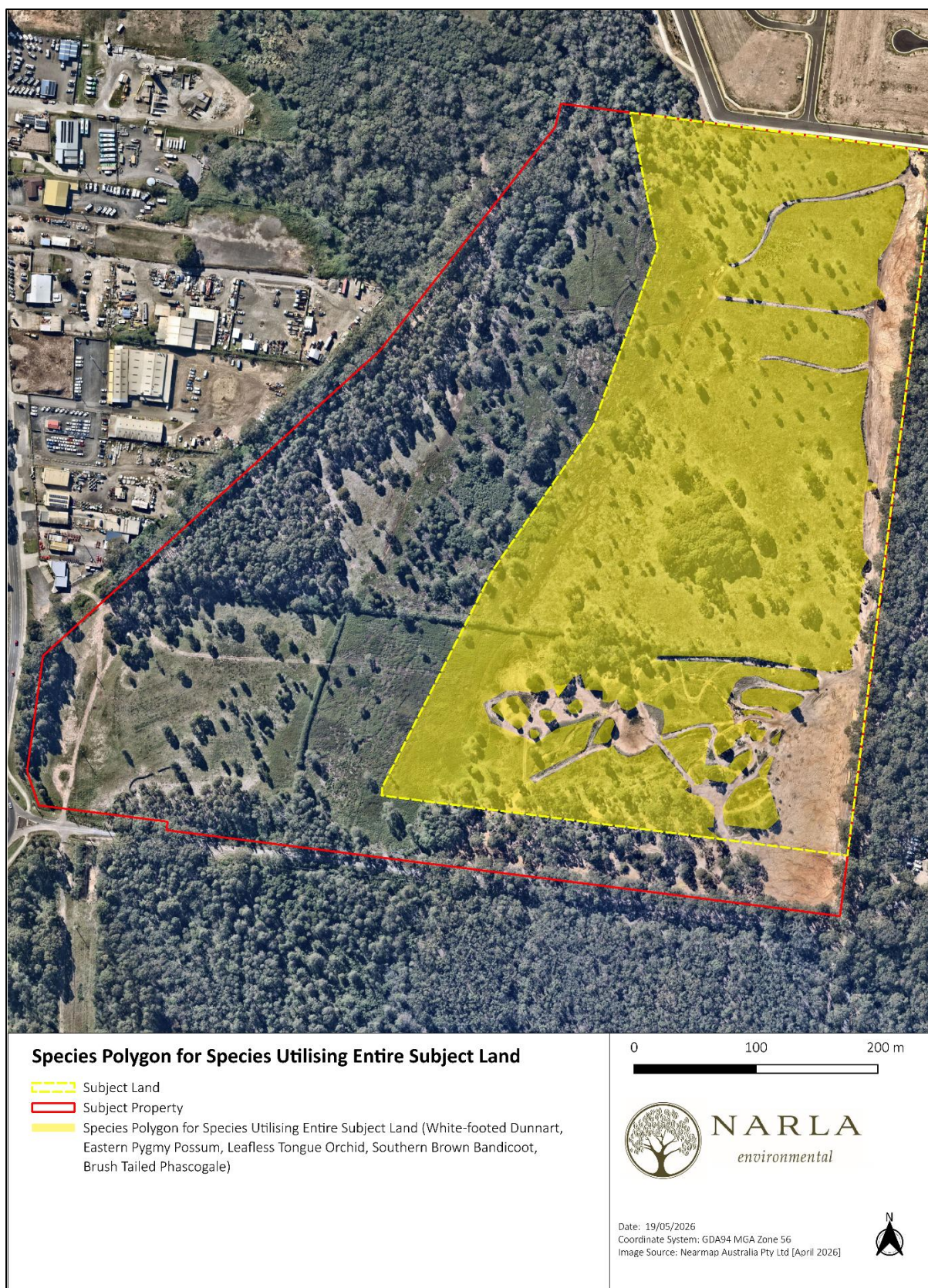


Figure 17. Species polygon for the assumed present species that utilise the entire Subject Land.

5. Prescribed Impacts

Certain projects may have impacts on biodiversity values in addition to, or instead of, impacts from clearing vegetation and/or loss of habitat. For many of these impacts, the biodiversity values may be difficult to quantify, replace or offset, making avoiding and minimising impacts critical. Prescribed biodiversity impacts require an assessment of the impacts of the potential future development on the habitat of threatened species or ecological communities. This is discussed in **Table 16**.

Table 16. Prescribed and uncertain impacts associated with the planning proposal.

Will there be impacts on any of the following?	Yes/No	If Yes, Address all of the assessment questions from section 6 of the BAM
Habitat of threatened entities including: ▪ karst, caves, crevices, cliffs, rocks and other geological features of significance, or ▪ human-made structures, or ▪ non-native vegetation.	No.	There are no karsts, caves, crevices, cliffs, rocks and other features of geological significance on or near the Subject Land. The Subject Land does not contain existing buildings or man-made structure, that will be demolished as part of the planning proposal. Non-native vegetation was present within the Subject Land; however, the removal of this vegetation is not expected to impact any threatened species.
On areas connecting threatened species habitat, such as movement corridors.	No	It is unlikely the planning proposal will interrupt connectivity for any threatened species, as connectivity will continue to exist beyond the Subject Land once the planning proposal is implemented and a large extent of wetland vegetation will be retained through the middle of the Subject Property which will provide connectivity. The planning proposal will dedicate a 50m wide corridor along the southern border as Conservation Zoning (C2). This will ensure the habitat trees are protected and formalise the connectivity between the regionally significant Browns Creek wildlife corridor and Worrigee Nature Reserve. Whilst the connectivity does rely on the private bushland of the property on the southeastern border. This property is currently owned and operated as a Rifle Range and risks of the bushland being cleared are considered low. The indicative road layout includes a nature strip through the centre of the residential zoning breaking up the built form and provide an opportunistic connectivity route. Specific landscaping plan has not

Will there be impacts on any of the following?	Yes/No	If Yes, Address all of the assessment questions from section 6 of the BAM
		been provided for review. However, it is recommended that street trees be planted along the roads and consist of native canopy species reflecting the ILGW TEC.
That affect water quality, water bodies and hydrological processes that sustain threatened entities (including from subsidence or upsidence from underground mining).	No	It is unlikely that the planning proposal would impact upon the water quality or the hydrological process of the Subject Land or nearby streams. It is also not expected that the removal of vegetation within the Subject Land will impact upon any groundwater processes within the surrounding landscape. The watercourses that intersect the Subject Land will continue to exist post development, and the planning proposal does not involve the change in levels, dredging or other changes to water flow.
On threatened and protected animals from turbine strikes from a wind farm.	No	No wind farms are associated with the planning proposal
On threatened species or fauna that are part of a TEC from vehicle strikes.	No	Due to the nature of the planning proposal, it is highly unlikely that vehicle strikes will be an issue given the slow speed requirements of vehicles within residential and areas.

6. Avoid, Minimise and Mitigate Impacts

6.1 Avoidance and Minimisation of Impacts

In accordance with the BAM, a proponent is required to demonstrate that all reasonable and practicable measures have been employed to avoid and minimise the impacts of a project on biodiversity values. Accordingly, this section outlines the avoidance and minimisation measures that have been incorporated into the project design of the proposed development. Due to the vegetated nature of the Subject Property, full avoidance of biodiversity values is not possible. The proposed development encompasses a total area of 16.58ha ('Certified Land').

The proposed development includes the full retention of the western half of the Subject Property ('Avoided Land', totalling 6.74ha). By doing so, the proposed development avoids impacts to substantial areas of EPBC listed Illawarra Lowland Grassy Woodland and habitat for several threatened species known to occur within the locality. In addition to the avoided land. The planning proposal includes a Conservation Zone of approximately 9.36ha adjoining the Browns Creek Riparian zone and a 50m wide corridor along the southern boundary of the Subject Property. Not only does this protect in perpetuity the BC listed River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast within the Subject Property. But also formalises the connectivity between the Regionally Significant Habitat Corridor from Browns Creek to the Worrigee Nature Reserve.

While it is assumed that the proposed development will clear the majority of the vegetation within the Certified Land, the final urban design will include a number of measures to avoid and minimise impacts to remnant trees, as well as increasing the sustainability and habitat value of the development (e.g. landscaping with native species, use of water sensitive urban design, relocation of fallen timber and rock).

6.2 Impact Mitigations

This section details the measures to be implemented before, during and post construction to avoid and minimise the impacts of the project (**Table 17**).

Table 17. Mitigation and management of impacts associated with the planning proposal.

Action	Outcome	Timing	Responsibility
Preparation of a Construction Environmental Management Plan (CEMP)	A CEMP may be required for the construction phase of the project, and will be prepared prior to issue of the Construction Certificate. The CEMP would include, as a minimum, industry-standard measures for the management of soil, surface water, weeds and pollutants, as well as site-specific measures, including the procedures outlined below. The proposed mitigation measures would include environmental safeguards for protection of neighbouring properties	Pre-construction phase	Proponent Construction Contractor

Action	Outcome	Timing	Responsibility
	and nearby waterways in accordance with relevant policy documentation and Government guidelines. In order to address the potential impacts of the proposal on biodiversity, the mitigation and management measures outlined within this table would be implemented as part of the CEMP for the site.		
Preparation of a Vegetation Management Plan (VMP)	A Vegetation Management Plan (VMP) should be prepared by a suitably qualified restoration ecologist for the 30m Riparian Buffer intersecting the Subject Land and the areas of retained bushland within the Subject Property (Figure 5). As well as the 50m habitat corridor on the southern boundary. This will ensure all potentially occurring indirect impacts to adjacent sensitive vegetation is minimised while maintaining the remaining biodiversity features of the property into the future.	Pre-construction phase	Proponent Project Ecologist
Assigning a Project Ecologist for Vegetation Clearing	Prior to construction, the applicant should commission the services of a qualified and experienced Ecologist Consultant (minimum 3 years' experience) with a minimum tertiary degree in Science, Conservation, Biology, Ecology, Natural Resource Management, Environmental Science or Environmental Management. The Ecologist must be licensed with a current Department of Primary Industries Animal Research Authority permit and New South Wales Scientific License issued under the BC Act. The Ecologist will be commissioned to: ▪ Undertake an extensive pre-clearing survey, delineating habitat-bearing trees and shrubs to be retained; ▪ Relocate fallen timber into conservation zones to provide habitat; ▪ Supervise the dewatering of the dams to safely capture and relocate any native species present; and ▪ Supervise the clearance of trees and shrubs (native and exotic) in order to capture, treat and/or relocate any displaced fauna.	Pre-construction phase	Proponent Project Ecologist
Tree Protections	Australian Standard 4970 (2025) Protection of Trees on Development Sites (AS-4970) outlines that a Tree Protection Zone (TPZ) is the principal means of protecting trees on construction sites. It is an area isolated from construction disturbance so that the tree remains viable. Ideally, works should be avoided within the TPZ. A Minor Encroachment is less than 10% of the TPZ and is outside the SRZ. A Minor Encroachment is considered acceptable by AS-4970 when it is compensated for elsewhere and contiguous within the TPZ.	Pre-construction phase	Proponent

Action	Outcome	Timing	Responsibility
	A Major Encroachment is greater than 10% of the TPZ or inside the SRZ. Major Encroachments generally require root investigations undertaken by non-destructive methods or the use of tree sensitive construction methods. Tree protection fencing is to be installed around all trees to be retained prior to construction works.		
Augmented Hollow/ Nest Box Installation	Whilst no hollow bearing trees are required to be removed. Artificial nest boxes or hollow augmentation should be utilized within the vegetation to be retained within the Subject Property. Nest boxes are to be monitored for a period of at least 2 years on a biannual basis. Any hollows/nestboxes that are observed to be damaged within this time should be replaced as soon as possible. The number and size of hollows required to be installed will be determined by the project ecologist.	Construction and post-construction phase	Proponent Project Ecologist
Native Species Landscaping	Any native planting proposed within the road reserves will reflect the ILGW vegetation community.	Construction and post-construction phase	Proponent Project Ecologist
Erosion and Sedimentation	Appropriate erosion and sediment control must be erected and maintained at all times during construction in order to avoid the potential of incurring indirect impacts on biodiversity values. As a minimum, such measures should comply with the relevant industry guidelines such as 'the Blue Book' (Landcom 2004).	Construction phase	Proponent Construction Contractor
Erection of temporary fencing	Temporary fencing should be erected around retained native vegetation that may incur indirect impacts on biodiversity values due to the construction works.	Construction phase	Proponent Construction Contractor
Storage and Stockpiling (Soil and Materials)	Allocate all storage, stockpile and laydown sites away from any native vegetation that is planned to be retained. Avoid importing any soil from outside the site as this can introduce weeds and pathogens to the site in order to avoid the potential of incurring indirect impacts on biodiversity values.	Construction phase	Construction Contractors
Stormwater	Potential impacts relating to stormwater and runoff will be managed during construction and operation phases. The CEMP will guide stormwater management during the construction phase of development.	Post-construction phase	Proponent Construction Contractors/ Architect

Action	Outcome	Timing	Responsibility
Signage	Signage along the roads should be installed either side of the nature strip to alert road users of fauna crossing hazards.	Post-construction phase	Proponent Construction Contractors/ Architect
Erection of permanent fencing	Permanent rural style/parkland fencing is to be installed on the boundary between the development and the conservation zoned land. Fencing must not be barbed wire and allow for fauna to pass unobstructed.	Post-construction phase	Proponent Construction Contractors/ Architect

7. Assessment of Impacts

7.1 Direct Impacts

The planning proposal will likely result in impacts to 13.47ha of native vegetation across the following vegetation zones:

- 2.45ha of Vegetation Zone 1: PCT 3269 – Moderate (All Strata Present)
- 11.02ha of Vegetation Zone 2: PCT 3269 – Low (Reduced Canopy)

7.2 Prescribed Impacts

No prescribed impacts are anticipated as a result of the planning proposal.

7.3 Indirect Impacts

Indirect impacts occur when the proposal or activities relating to the construction or operation of the proposal affect native vegetation, threatened ecological communities and threatened species habitat beyond the Subject Land. Impacts may also result from changes to land-use patterns, such as an increase in vehicular access and human activity on native vegetation, threatened ecological communities and threatened species habitat. The indirect impacts of the planning proposal are outlined in **Table 18**.

Table 18. Indirect impacts associated with the planning proposal.

Indirect Impact	Nature, Extent and Duration	TEC's/PCTs and/or Threatened Species and Their Habitat Likely to be Impacted	Consequences of the Impacts for the Bioregional Persistence of the Threatened Species, Threatened Ecological Communities and Their Habitats.
(a) inadvertent impacts on adjacent habitat or vegetation	Vegetation and habitat directly adjacent to the Subject Land has the potential to experience ongoing indirect impacts as a result of the planning proposal. The disturbance caused during construction and increased human utilisation may increase weed infestations within adjacent vegetation, which in turn may decrease its habitat value.	TECs ILGW, ISCLFW and REC within the Subject Property. There is the potential that threatened species occur in areas adjacent to the Subject Land that may be impacted by a decrease in habitat condition.	While changes to vegetation condition may have a localised impact to PCTs, TECs, threatened species and their habitats, this is not expected to impact on their bioregional persistence considering the large habitat connectivity within the surrounding areas. Furthermore, the preparation of a VMP will assist in ensuring any potential impacts are kept to a minimum.
(b) reduced viability of adjacent habitat due to edge effects	The proposed future construction and ongoing utilisation of the Subject Land may lead to an increase in weed infiltration into adjacent habitat due to enhanced edge effects. However, any impacts are expected to be restricted to a couple of metres into adjacent vegetation.	TECs ILGW and ISCLFW within the Subject Property. There is the potential that threatened species occur in areas adjacent to the Subject Land that may be impacted by edge effects leading to a reduced viability in habitat.	While changes to adjacent habitat may have a localised impact to PCTs, TECs, threatened species and their habitats, this is not expected to impact on their bioregional persistence considering the large habitat connectivity within the surrounding areas. Furthermore, the preparation of a VMP will assist in ensuring any potential impacts are kept to a minimum.
(c) reduced viability of adjacent habitat due to noise, dust or light spill	An increase in noise is to be expected during and post construction associated with the planning proposal as well as the increased utilisation of the property. This may have an	TECs ILGW and ISCLFW within the Subject Property. There is also the potential that threatened species occur in areas adjacent to	While an increase in noise, dust and light may have a localised impact to PCTs, TECs, threatened species and their habitats, this is not expected to impact on their bioregional

Indirect Impact	Nature, Extent and Duration	TEC's/PCTs and/or Threatened Species and Their Habitat Likely to be Impacted	Consequences of the Impacts for the Bioregional Persistence of the Threatened Species, Threatened Ecological Communities and Their Habitats.
	impact on any species roosting adjacent to the site during the day that are not adapted to such noises. It is not expected that construction would occur throughout the night, and as such would not impact on nocturnal species that may utilise adjacent habitat, or diurnal species that roost in adjacent habitat. The construction and utilisation may increase dust in adjacent habitat. Dust can impact on a plants ability to photosynthesise and may increase plant mortality in the adjacent vegetation. It is expected that the construction would occur during normal working hours, however lighting that is utilised following development may decrease the habitat viability of the immediately surrounding vegetation for nocturnal species.	the Subject Land that may be impacted by an increase in dust spill into adjacent habitats.	persistence, considering large areas of habitat connectivity allows them to move away from impacted areas. Furthermore, the preparation of a VMP will assist in ensuring any potential impacts are kept to a minimum.
(d) transport of weeds and pathogens from the site to adjacent vegetation	As previously discussed, the proposed construction and utilisation may lead to an increase in weed infiltration into adjacent habitat due to enhanced edge effects as well as may lead to the introduction of pathogens. It is however not expected that weeds nor	TECs ILGW and ISCLFW within the Subject Property. There is the potential that threatened species occur in areas adjacent to the Subject Land that may be impacted by a decrease in habitat condition.	While changes to vegetation condition may have a localised impact to PCTs, TECs, threatened species and their habitats, this is not expected to impact on their bioregional persistence considering the large habitat connectivity within the surrounding areas.

Indirect Impact	Nature, Extent and Duration	TEC's/PCTs and/or Threatened Species and Their Habitat Likely to be Impacted	Consequences of the Impacts for the Bioregional Persistence of the Threatened Species, Threatened Ecological Communities and Their Habitats.
	pathogens will be transported via human or vehicular traffic into surrounding areas during construction. Temporary fencing will be erected around retained native vegetation to avoid such indirect impacts occurring during construction.		The introduction of pathogens such as myrtle rust, has the potential to detrimentally impact native vegetation. This impact will be mitigated through the installation of exclusion fencing around vegetation to be retained. Furthermore, the preparation of a VMP will assist in ensuring any potential impacts are kept to a minimum.
(e) increased risk of starvation, exposure and loss of shade or shelter	It is highly unlikely that any threatened fauna would be exposed to increased risks from starvation, exposure, and loss of shade and shelter as a result of the planning proposal given the poor quality of habitat proposed for removal, which is only connected to the wider landscape by roadside vegetation. No habitat is to be removed beyond the Subject Land, although disturbances from noise during construction and utilisation may deem such habitats unsuitable for certain species. However, due to the surrounding land uses of the locality, where this impact is already experienced this is not considered likely to be significant.	N/A	N/A

Indirect Impact	Nature, Extent and Duration	TEC's/PCTs and/or Threatened Species and Their Habitat Likely to be Impacted	Consequences of the Impacts for the Bioregional Persistence of the Threatened Species, Threatened Ecological Communities and Their Habitats.
(f) loss of breeding habitats	An increase in noise is to be expected during and post- construction. As such, there is potential for disturbance to breeding habitats directly adjacent to the Subject Land. However, due to the large areas of habitat connectivity in the broader landscape and no habitat removal proposed beyond the Subject Land, it is not expected for this to significantly impact on species inhabiting such areas.	There is potential that threatened fauna species use habitat adjacent to the Subject Land for breeding. Such species may be impacted by a reduction in habitat viability, which may in turn impact on their breeding capacity.	Any impacts to threatened species adjacent to the Subject Land is expected to be localised and will not have an overall impact on the bioregional persistence of threatened species.
(g) trampling of threatened flora species	No threatened flora records exist in the properties surrounding the Subject Property. However, prior to any works being undertaken, the proposed work area will be fenced off to mitigate any risks of accidental trampling. It is therefore not expected such areas would be accessed during and post-construction. There is potential for further threatened flora species to exist outside the Subject Land, however no works are proposed in these areas and therefore trampling should not be an issue.	N/A	N/A
(h) inhibition of nitrogen fixation and increased soil salinity	It is unlikely that the inhibition of nitrogen fixation will affect vegetation adjacent to the	N/A	N/A

Indirect Impact	Nature, Extent and Duration	TEC's/PCTs and/or Threatened Species and Their Habitat Likely to be Impacted	Consequences of the Impacts for the Bioregional Persistence of the Threatened Species, Threatened Ecological Communities and Their Habitats.
	Subject Land. Clearing will be limited to the Subject Land and as such is not expected to affect vegetation directly adjacent to the Subject Land.		
(i) fertiliser drift	This issue is not likely to affect the vegetation within or surrounding the Subject Land. As the risk for fertiliser drift is considered minimal for residential land uses.	N/A	N/A
(j) rubbish dumping	There is the possibility that rubbish dumping (including littering) in adjacent vegetation increases during and post construction. The dumping/littering of food resources may provide a food source for fauna, including threatened species. However, this may also encourage invasive species into such habitats. This impact can be mitigated by the appropriate disposal of rubbish.	There is low potential that threatened fauna species use habitat adjacent to the Subject Land. Such species may be impacted by the dumping of rubbish, particularly food resources. This may result in both positive (food source) and negative impacts (increase in predators) to such species.	This impact is expected to be localised and will not have an overall impact on the bioregional persistence of the threatened species.
(k) wood collection	This issue is not likely to affect the vegetation surrounding the Subject Land during and post-construction. Permanent fencing is required between the development and the land to be protected for conservation.	N/A	N/A

Indirect Impact	Nature, Extent and Duration	TEC's/PCTs and/or Threatened Species and Their Habitat Likely to be Impacted	Consequences of the Impacts for the Bioregional Persistence of the Threatened Species, Threatened Ecological Communities and Their Habitats.
(l) bush rock removal and disturbance	This issue is not likely to affect the vegetation surrounding the Subject Land. No bush rock was observed within or adjacent to the Subject Land.	N/A	N/A
(m) increase in predatory species populations	Predatory species, such as foxes, likely already inhabit areas within and surrounding the Subject Land. There is the possibility that other indirect impacts, such as an increase in rubbish dumping, may encourage predatory species into the area.	There is the low potential that threatened fauna species use habitat adjacent to the Subject Land. Such species may be impacted by an increase in predatory species populations.	As predatory species likely already utilise the areas surrounding the Subject Land any increase as a result of the future development is expected to be localised and will not have an overall impact on the bioregional persistence of the threatened species.
(n) increase in pest animal populations	Pest animal populations such as rabbits, likely already inhabit areas within and surrounding the Subject Land. There is the possibility that other indirect impacts, such as an increase in rubbish dumping, may encourage an increase in pest animal populations.	There is the low potential that threatened fauna and flora species use habitat adjacent to the Subject Land. Such species may be impacted by an increase in pest animal populations.	As pest species likely already utilise the areas surrounding the Subject Land any increase as a result of the future development is expected to be localised and will not have an overall impact on the bioregional persistence of the threatened species.
(o) increased risk of fire	The removal of vegetation as a result of the planning proposal is not expected to alter the bushfire risk of vegetation surrounding the Subject Land.	N/A	N/A

Indirect Impact	Nature, Extent and Duration	TEC's/PCTs and/or Threatened Species and Their Habitat Likely to be Impacted	Consequences of the Impacts for the Bioregional Persistence of the Threatened Species, Threatened Ecological Communities and Their Habitats.
(p) disturbance to specialist breeding and foraging habitat, e.g., beach nesting for shorebirds.	No areas of specialist breeding or foraging habitat is expected to be impacted as a result of the planning proposal	N/A	N/A

8. Threshold for Assessing and Offsetting

8.1 Impacts on Native Vegetation

The following native vegetation within the Subject Land is expected to be impacted as a result of the planning proposal:

- 2.45ha of Vegetation Zone 1: PCT 3269 – Moderate (All Strata Present)
- 11.02ha of Vegetation Zone 2: PCT 3269 – Low (Reduced Canopy)

The purchase and retirement of Biodiversity Offset Credits will be required for Vegetation Zone 1 and 2 within the Subject Land.

8.2 Impacts on Threatened Species

The following threatened species have either been assumed present within the Subject Land and will require the purchase and retirement of Biodiversity Offset Credits or suitable targeted surveys to confirm their absence:

- *Callocephalon fimbriatum* (Gang-gang Cockatoo)
- *Calyptorhynchus lathami lathami* (South-eastern Glossy Black-Cockatoo)
- *Cercartetus nanus* (Eastern Pygmy-possum)
- *Cryptostylis hunteriana* (Leafless Tongue Orchid)
- *Haliaeetus leucogaster* (White-bellied Sea-Eagle)
- *Heleioporus australiacus* (Giant Burrowing Frog)
- *Hieraaetus morphnoides* (Little Eagle)
- *Isodon obesulus obesulus* (Southern Brown Bandicoot)
- *Litoria aurea* (Green and Golden Bell Frog)
- *Lophoictinia isura* (Square-tailed Kite)
- *Myotis macropus* (Southern Myotis)
- *Pandion cristatus* (Eastern Osprey)
- *Petauroides volans* (Southern Greater Glider)
- *Petaurus norfolcensis* (Squirrel Glider)
- *Phascogale tapoatafa* (Brush-tailed Phascogale)
- *Phascolarctos cinereus* (Koala)
- *Sminthopsis leucopus* (White-footed Dunnart)

8.3 Serious and Irreversible Impacts (SAII's)

One (1) threatened ecological community within the Subject Land has been identified as an entity at risk of an SAI in the Threatened Biodiversity Data Collection (NDCCEW 2026e):

- Illawarra lowlands grassy woodland in the Sydney Basin Bioregion. (Principal 1, 2 and 3)

8.3.1 Illawarra lowlands grassy woodland in the Sydney Basin Bioregion

Due to the sensitivity of this TEC to any impact, a determination of whether or not the proposed impacts are serious and irreversible is to be undertaken in accordance with Section 9.1 of the BAM (DPIE 2020a) is required. This is outlined in **Table 19**.

Table 19. Additional impact assessment provisions for ecological communities that are associated with a serious and irreversible impact.

Serious and Irreversible Impact (SII) Impact assessment provisions for ecological communities: Illawarra lowlands grassy woodland in the Sydney Basin Bioregion (ILGW-SBB)		
BC Act Status: Endangered		
a) the action and measures taken to avoid the direct and indirect impact on the potential entity for a SII	Due to the vegetated nature of the Subject Property, it was not possible to completely avoid impacts. The core wetland area present within the Subject Property will be avoided by the planning proposal. To address indirect impacts, measures include developing a Construction Environmental Management Plan (CEMP), overseeing vegetation management activities by a qualified ecologist, and recommending the creation of a Vegetation Management Plan (VMP) for the intact bushland within the greater Subject Property.	
b) the area (ha) and condition of the threatened ecological community (TEC) to be impacted directly and indirectly by the proposed development. The condition of the TEC is to be represented by the vegetation integrity score for each vegetation zone	The proposed development will impact on approximately 2.45ha of vegetation from Zone 1: Moderate Condition and 11.02ha of Zone 1: Low Condition that conformed to this TEC. Vegetation Zone 1 comprised of a native canopy above a regenerating mid storey and ground layer, VI score = 38.9. Vegetation Zone 2 comprised of a regenerating shrub and ground layer with sparse canopy, VI score = 17.7 There is the potential for the planning proposal to have an indirect impact on areas of ILGW-SBB not being removed surrounding the Subject Land. However, the implementation of the mitigation measures proposed in Table 17 , will ensure any indirect impacts are kept to a minimum.	
c) the extent and overall condition of the potential TEC within an area of 1,000ha, and then 10,000ha, surrounding the proposed development footprint	Mapping from the NSW State Vegetation Type Map (DPE 2022a) indicates the presence of approximately 571.18ha of ILGW-SBB within an area of 1,000ha surrounding the Subject Land, and 1493.91ha of ILGW-SBB within an area of 10,000ha surrounding the Subject Land. The ILGW-SBB within these areas largely comprises fragmented patches of varying sizes. The conditions of these patches cannot be determined without ground truthing, although are expected to be partially degraded due to their positioning within a residential landscape.	
d) an estimate of the extant area and overall condition of the potential TEC remaining in the IBRA subregion before and after the impact of the proposed development has been taken into consideration	The NSW State Vegetation Type Map (DPE 2022a) indicates approximately 2949.52ha of ILGW-SBB occurs within the Jervis IBRA Subregion. This comprises fragmented patches of varying sizes. The conditions of these patches cannot be determined without ground truthing. Overall, the impact of the planning proposal will result in impacts to 13.47ha of ILGW-SBB from the Jervis subregion accounting for approximately 0.45% of the extant area of ILGW-SBB in the Jervis IBRA Subregion. This will result in approximately 2935ha of ILGW-SBB remaining within the Jervis IBRA Subregion after the planning proposal.	
e) an estimate of the area of the candidate TEC that is in the reserve system within the IBRA region and the IBRA subregion	No areas of ILGW-SBB are presently included in formal conservation reserves though some occur in small council reserves including Blackbutt Reserve and Croome Road Reserve in Shellharbour (NSW Threatened Species Scientific Community, 2011).	
f) the development, clearing or biodiversity certification proposal's impact on:	i) abiotic factors critical to the long-term survival of the potential TEC; for example, how much the impact will	The planning proposal has the potential to alter the natural hydrology occurring within and surrounding the Subject Land due to excavation works during

Serious and Irreversible Impact (SII) Impact assessment provisions for ecological communities: Illawarra lowlands grassy woodland in the Sydney Basin Bioregion (ILGW-SBB)		
BC Act Status: Endangered		
	lead to a reduction of groundwater levels or the substantial alteration of surface water patterns	construction. This may alter water runoff levels and increase nutrients into adjacent areas of ILGW-SBB, causing an increase in weed infestations. However, owing to the altered nature of the vegetation adjacent to the Subject Land this is not expected to a significant impact.
	ii) characteristic and functionally important species through impacts such as, but not limited to, inappropriate fire/flooding regimes, removal of understorey species or harvesting of plants	The areas of ILGW-SBB within the Subject Land are of a moderate quality with a native canopy above a understorey historically subject to disturbance (e.g. grazing). Fire and flood regimes have been largely altered due to surrounding land uses that have occurred in the area. Therefore, it is highly unlikely that the planning proposal will exacerbate impacts on characteristic and functionally important species as the area is already altered. It is not expected that the planning proposal will impact any characteristic and functionally important species outside of the Subject Land.
	iii) the quality and integrity of an occurrence of the potential TEC through threats and indirect impacts including, but not limited to, assisting invasive flora and fauna species to become established or causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants which may harm or inhibit growth of species in the potential TEC	The planning proposal may enhance weed infiltration into adjacent habitat by an increase in edge effects. However, owing to the number of exotic species already present within the vegetation adjacent to the Subject Land this is not expected to a significant impact. It is therefore not expected that the quality and integrity of adjacent ILGW-SBB will be significantly reduced by the proposed development.
g) direct or indirect fragmentation and isolation of an important area of the potential TEC	The ILGW-SBB within the Subject Land and surrounds occurs within a 'Priority Management Area' as defined under the Saving our Species Strategy (DPE 2024h).	
h) the measures proposed to contribute to the recovery of the potential TEC in the IBRA subregion.	The Saving our Species Strategy (DPE 2024h) has identified critical actions proposed to manage key threats to conserve this ecological community, including: Conduct targeted physical and chemical weed control and bush regeneration activities after establishing weed management requirements.	

Serious and Irreversible Impact (SII) Impact assessment provisions for ecological communities: Illawarra lowlands grassy woodland in the Sydney Basin Bioregion (ILGW-SBB)	
BC Act Status: Endangered	
	- Define and implement an appropriate grazing regime to manage weeds and biomass in the site. - Review current fencing requirements and assess the quality of fencing installed. Repair, replace, and add new fencing as needed to manage domestic stock movement. - Liaise with relevant parties (TransGrid, Council, etc.) to ensure environmental values are considered during infrastructure maintenance works, specifically electrical easement management. - Undertake ground-based shooting and other management actions if deemed appropriate, following protocols of the Northern Illawarra Deer Management Plan. - Research appropriate fire regimes to maintain a community structure consistent with Illawarra Lowlands Grassy Woodlands. - Determine the extent of Illawarra Lowlands Grassy Woodlands within the site boundary and corresponding tenure. Approach landholders for conservation participation, identifying threats and implementing protective actions. - Consult with relevant parties utilizing the area regarding its environmental values. Provide advice on activities impacting the Illawarra Lowlands Grassy Woodlands community and mitigation measures. - Undertake ongoing measures to restrict and manage inappropriate recreational activities such as 4WD use or creation of unwanted mountain bike tracks. - Conduct ground-based trapping or shooting of goats in coordination with other SoS projects in the site. - Determine the current extent of Illawarra Lowlands Grassy Woodlands within the site and identify landholders willing to engage in conservation. Determine appropriate locations for inclusion in the SoS program. - Create and distribute educational material discussing environmental values and impacts of weeds. Provide information on how local landholders can contribute to weed management. - Implement ongoing measures to restrict and manage inappropriate recreational activities associated with camping grounds through signage and liaison with appropriate authorities. A number of impact mitigation measures are to be implemented by the proponent before, during and after construction to avoid and minimise the impacts of the proposed development on IGLW-SBB (see Table 17).

9. Biodiversity Offset Credit Requirements

The preferred approach to offset the residual impacts of the proposal is to purchase and retire the appropriate species credits from registered Biodiversity Stewardship Sites that comply with the trading rules of the NSW BOS in accordance with the 'like for like' report generated by the BAM calculator. If such credits are unavailable, credits would be sourced in accordance with the 'variation report' generated by the BAMC.

A payment to the Biodiversity Conservation Trust (BCT) would be considered as a contingency option if a suitable number and type of biodiversity credits cannot be secured.

9.1 Offset Requirement for Ecosystem Credits

A total of one-hundred and forty-six (146) ecosystem credits are required to offset the likely biodiversity impacts of the planning proposal (Table 20).

Table 20. Ecosystem credits required to offset the likely impacts associated with the planning proposal. Areas have been rounded up by the BAMC.

Plant Community Type (PCT)	BC Act Status	Vegetation Zone	Total Area (ha)	Ecosystem Credits Required
PCT 3269: Shoalhaven Lowland Spotted Gum-Paperbark Forest	Illawarra Lowlands Grassy Woodland in the Sydney Basin Bioregion	Zone 1 – PCT 3269 – Moderate (All Strata Present)	2.5	48
		Zone 2 – PCT 3269 – Low (Reduced Canopy)	11	98
Total Ecosystem Credits				146

9.2 Offset Requirement for Species Credits

A total of 1,490 species credits that have been 'assumed present' will require offsetting through the retiring of biodiversity offset species credits under the BOS as a result of the likely impacts associated with the planning proposal (Table 21), if no targeted surveys are conducted to confirm their absence from within the Subject Land.

Table 21. Species credits required to offset the likely impacts associated with the planning proposal. Areas have been rounded up by the BAMC.

Species	Vegetation Zones	Total Area (ha)	Species Credits Required
<i>Callocephalon fimbriatum</i> Gang-gang Cockatoo	Zone 1 – PCT 3269 – Moderate (All Strata Present) (2.4ha)	2.4	48
<i>Calyptorhynchus lathami</i> South-eastern Glossy Black-Cockatoo	Zone 1 – PCT 3269 – Moderate (All Strata Present) (2.4ha)	2.4	48
<i>Cercartetus nanus</i> Eastern Pygmy-possum	Zone 1 – PCT 3269 – Moderate (All Strata Present) (2.4ha)	13.4	146

	Zone 2 – PCT 3269 – Low (Reduced Canopy) (11.0ha)		
<i>Cryptostylis hunteriana</i> Leafless Tongue Orchid	Zone 1 – PCT 3269 – Moderate (All Strata Present) (2.4ha) Zone 2 – PCT 3269 – Low (Reduced Canopy) (11.0ha)	13.4	109
<i>Haliaeetus leucogaster</i> White-bellied Sea-Eagle	Zone 1 – PCT 3269 – Moderate (All Strata Present) (2.4ha)	2.4	48
<i>Heleioporus australiacus</i> Giant Burrowing Frog	Zone 1 – PCT 3269 – Moderate (All Strata Present) (2.4ha) Zone 2 – PCT 3269 – Low (Reduced Canopy) (11.0ha)	13.4	109
<i>Hieraaetus morphnoides</i> Little Eagle	Zone 1 – PCT 3269 – Moderate (All Strata Present) (2.4ha)	2.4	36
<i>Isoodon obesulus obesulus</i> Southern Brown Bandicoot (eastern)	Zone 1 – PCT 3269 – Moderate (All Strata Present) (2.4ha) Zone 2 – PCT 3269 – Low (Reduced Canopy) (11.0ha)	13.4	146
<i>Litoria aurea</i> Green and Golden Bell Frog	Zone 1 – PCT 3269 – Moderate (All Strata Present) (2.4ha) Zone 2 – PCT 3269 – Low (Reduced Canopy) (11.0ha)	13.4	146
<i>Lophoictinia isura</i> Square-tailed Kite	Zone 1 – PCT 3269 – Moderate (All Strata Present) (2.4ha)	2.4	36
<i>Myotis macropus</i> Southern Myotis	Zone 1 – PCT 3269 – Moderate (All Strata Present) (2.4ha) Zone 2 – PCT 3269 – Low (Reduced Canopy) (11.0ha)	13.4	146
<i>Pandion cristatus</i> Eastern Osprey	Zone 1 – PCT 3269 – Moderate (All Strata Present) (2.4ha)	2.4	36
<i>Petauroides volans</i> Southern Greater Glider	Zone 1 – PCT 3269 – Moderate (All Strata Present) (2.4ha)	2.4	48
<i>Petaurus norfolcensis</i> Squirrel Glider	Zone 1 – PCT 3269 – Moderate (All Strata Present) (2.4ha)	2.4	48
<i>Phascogale tapoatafa</i> Brush-tailed Phascogale	Zone 1 – PCT 3269 – Moderate (All Strata Present) (2.4ha) Zone 2 – PCT 3269 – Low (Reduced Canopy) (11.0ha)	13.4	146
<i>Phascolarctos cinereus</i> Koala	Zone 1 – PCT 3269 – Moderate (All Strata Present) (2.4ha)	2.4	48
<i>Sminthopsis leucopus</i> White-footed Dunnart	Zone 1 – PCT 3269 – Moderate (All Strata Present) (2.4ha) Zone 2 – PCT 3269 – Low (Reduced Canopy) (11.0ha)	13.4	146
Total Species Credits:			1490

10. Biodiversity certification offsets and strategy

10.1 Land uses

10.1.1 Land Proposed for Biodiversity Certification

The land proposed for biodiversity certification is shown in **Figure 1**.

10.1.2 Land Proposed for Biodiversity Conservation

The land proposed for biodiversity conservation is shown in **Figure 1**. This area is proposed to be rezoned as Conservation Land (C2) and accounts for 9.36ha of the Subject Property.

10.1.3 Land Proposed to be Retained

The land proposed to be retained accounts for approximately 6.74ha. This area is proposed to be retained as Employment Land. Existing development assessment and approval arrangements under the EP&A Act will continue to apply to this land.

Table 22. Land uses and offsets for the biodiversity certification proposal.

Land use	Area (ha)	Native vegetation extent (ha)
Within biodiversity certification assessment area		
Total area of biodiversity certification assessment area	25.62	22.83
Land proposed for certification	16.26	13.47
Avoided land (land that is avoided for biodiversity reasons)	9.36	9.36
Land proposed for a biodiversity stewardship site as a source of credits to offset impacts on the biodiversity certified land (if applicable)	NA	NA
Retained land (land that is neither proposed for certification nor proposed for a conservation measure)	6.74	6.74

10.2 Offset Strategy

The offsets strategy for the biodiversity certification proposal includes the following:

The following ecosystem credits are required to be offset in order to mitigate the likely impacts to biodiversity as a result of the planning proposal:

- 146 ecosystem credits for PCT 3269.

Areas of vegetation identified as PCT 3269 within the Subject Land conforms to the following Biodiversity Conservation Act 2016 (BC Act) listed Critically Endangered Ecological Community:

- Illawarra Lowlands Grassy Woodland in the Sydney Basin Bioregion.

1,490 species credit species were required to be assumed present owing to the presence of suitable habitat within the Subject Land and a lack of suitable survey in accordance with DPE guidelines being conducted at the time of

preparing this report to confirm their absence. The following species credits are therefore required to be offset in order to mitigate the impacts upon these species as a result of the planning proposal:

- 48 species credits for *Callocephalon fimbriatum* (Gang-gang Cockatoo)
- 48 species credits for *Calyptorhynchus lathami lathami* (South-eastern Glossy Black-Cockatoo)
- 146 species credits for *Cercartetus nanus* (Eastern Pygmy-possum)
- 109 species credits for *Cryptostylis hunteriana* (Leafless Tongue Orchid)
- 48 species credits for *Haliaeetus leucogaster* (White-bellied Sea-Eagle)
- 109 species credits for *Heleioporus australiacus* (Giant Burrowing Frog)
- 36 species credits for *Hieraaetus morphnoides* (Little Eagle)
- 146 species credits for *Isodon obesulus obesulus* (Southern Brown Bandicoot (eastern))
- 146 species credits for *Litoria aurea* (Green and Golden Bell Frog)
- 36 species credits for *Lophoictinia isura* (Square-tailed Kite)
- 146 species credits for *Myotis macropus* (Southern Myotis)
- 36 species credits for *Pandion cristatus* (Eastern Osprey)
- 48 species credits for *Petauroides volans* (Southern Greater Glider)
- 48 species credits for *Petaurus norfolcensis* (Squirrel Glider)
- 146 species credits for *Phascogale tapoatafa* (Brush-tailed Phascogale)
- 48 species credits for *Phascolarctos cinereus* (Koala)
- 146 species credits for *Sminthopsis leucopus* (White-footed Dunnart)

Subject to the Developer obtaining all required consents, approvals, licences, permits or authorisations for vegetation clearing within Subject Land, the Developer will prepare a Construction Environment Management Plan (CEMP) to the satisfaction of Council, prior to clearing in the proposal to incorporate the Developers Statement of Commitments to guide the development outlined in this biocertification assessment and ensure that all direct and indirect impacts (e.g. APZs, utilities, access, stormwater run-off etc) are contained within the development footprint and appropriate mitigation measures are put in place to minimise indirect impacts to threatened fauna including Koala, Squirrel Glider and microbats. Specifically, this will address the management of the land proposed for conservation measures and their buffers such that surrounding roads will be fully curbed and guttered with no stormwater being discharged into the conservation areas (treated water from the detention basins within the development footprint will flow into existing riparian areas).

The CEMP will include, but not be limited to:

- Temporary and permanent protective fencing will be erected around all areas identified for conservation prior to clearing activities commencing in relevant stages to minimise any inadvertent damage;
- Any trees, or parts thereof, that would be appropriate for use as fauna habitat in the Browns Creek and southern habitat corridor, will be identified and salvaged;
- Roads surrounding each part of the Conservation Areas will be fully curbed and guttered with piped stormwater management infrastructure to ensure that stormwater will not flow directly into the Conservation Areas;
- A fauna pre-clearance protocol will be prepared for the removal of all trees within the Biocertification Area;
- Lighting around conservation areas designed to minimise impacts to fauna; and
- Monitoring of performance measures and non-compliance.

11. Other Relevant Legislation and Planning Policies

11.1 State Environmental Planning Policy (Biodiversity and Conservation) 2021 – Chapter 4: Koala Habitat Protection 2021.

This Policy aims to encourage the conservation and management of areas of natural vegetation that provide habitat for koalas to support a permanent free-living population over their present range and reverse the current trend of koala population decline. This Chapter applies to LGAs that are listed in Schedule 2 ‘Local government areas’ of the SEPP. As the Shoalhaven LGA is included in Schedule 2, this Chapter applies to the Subject Land. As such, the development control provisions of Part 4.2 of the SEPP apply to development applications relating to the land, as the land:

- Has an area of at least 1 hectare (including adjoining land within the same ownership); and
- Does not have an approved koala plan of management applying to the land.

Before a council may grant consent to a development application for consent to carry out development on the land, the council must assess whether the development is likely to have any impact on koalas or koala habitat. If the council is satisfied that the development is likely to have low or no impact on koalas or koala habitat, the council may grant consent to the development application.

A site assessment was undertaken to determine whether the land contained core koala habitat, which is defined by the SEPP as:

- an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas are recorded as being present at the time of assessment of the land as highly suitable koala habitat, or
- an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas have been recorded as being present in the previous 18 years.

Although the Subject Land contained suitable habitat (where 15% or greater of the total number of trees are the regionally relevant species of those listed in Schedule 3 of the SEPP), no signs of koala’s or koala occupancy (scats, scratch marks) were observed within the Subject Land and there are no Koala records within 2.5km of the Subject Land in the last 18 years. It was therefore determined that the Subject Land was unlikely to contain core koala habitat, and no further assessment under the SEPP (i.e. Koala Assessment Report) should be required.

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13. Appendices

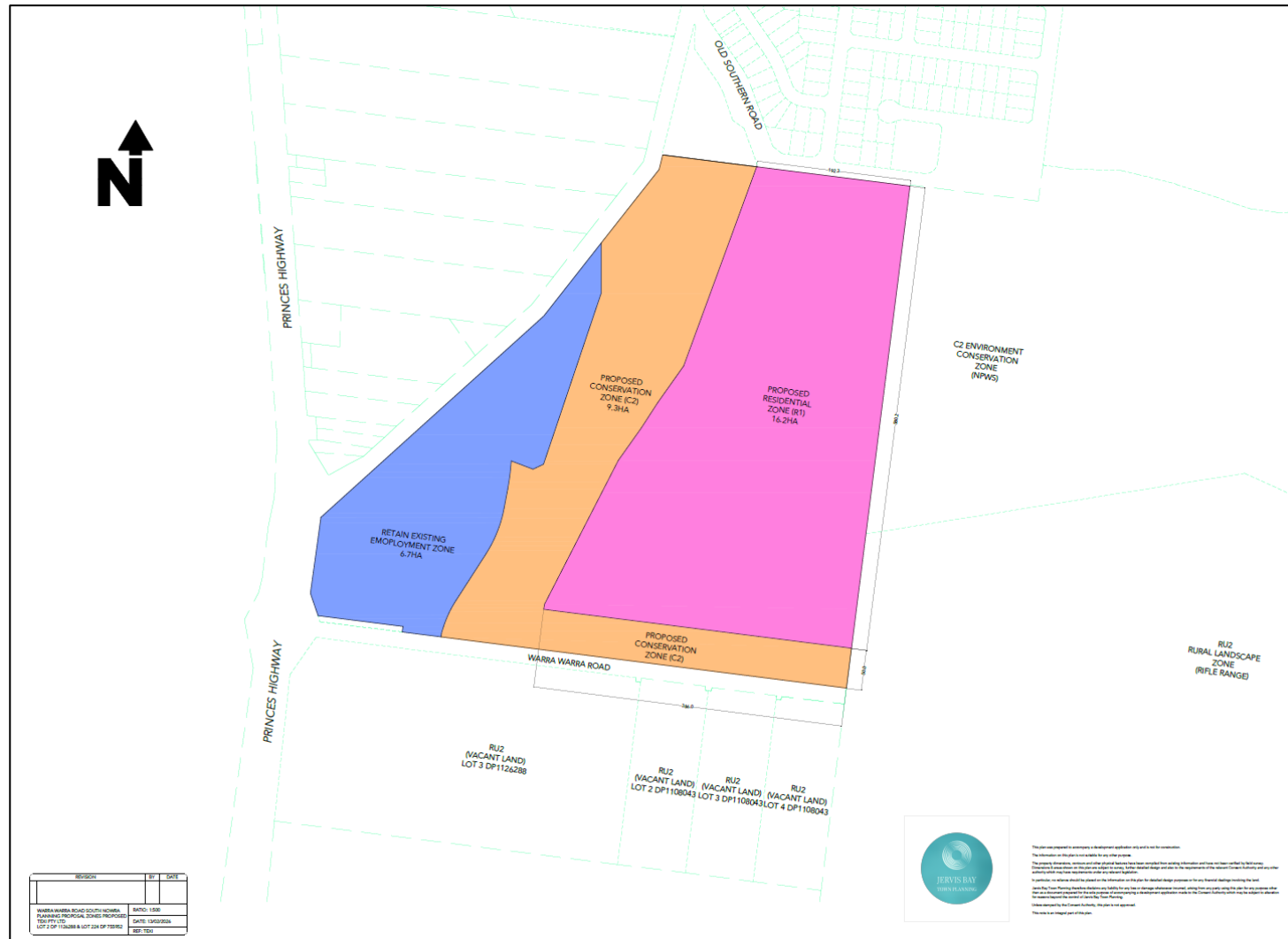
Appendix A. Proposed Rezoning Layout (Jervis Bay Town Planning 2026)

Appendix B. Initial indicative-built form map (Jervis Bay Town Planning 2024).

Appendix C. BAM Site - Field Survey Forma (copied directly from Electronic Data Sheet).

Appendix D. BAMC Generated Biodiversity Credit Report.

Appendix A. Proposed Rezoning Layout (Jervis Bay Town Planning 2026)



Appendix C. BAM Site - Field Survey Form (copied directly from Electronic Data Sheet).

BAM Site – Field Survey Form					
Date:	08.05.2024	Plot ID:	1	Photo #:	0
Zone:	56	Plot Dimensions:	50x20m	Easting:	281294
Datum:	GDA94	Middle bearing from 0m:	48	Northing:	6132642
PCT:	PCT 3269 – Low (Reduced Canopy)				

Growth Form	Scientific Name	Cover	Abundance
Shrub (SG)	<i>Kunzea ambigua</i>	40	150
Grass & grasslike (GG)	<i>Aristida vagans</i>	5	500
Grass & grasslike (GG)	<i>Cymbopogon refractus</i>	2	250
Shrub (SG)	<i>Hakea sericea</i>	2	5
Shrub (SG)	<i>Acacia falcata</i>	2	7
Grass & grasslike (GG)	<i>Lomandra multiflora subsp. multiflora</i>	2	10
Shrub (SG)	<i>Pimelea linifolia</i>	1	5
HTE	<i>Senecio madagascariensis</i>	0.2	15
HTE	<i>Axonopus fissifolius</i>	0.5	500
Forb (FG)	<i>Hypericum gramineum</i>	0.1	20
Other (OG)	<i>Glycine clandestina</i>	0.1	15
Forb (FG)	<i>Centella asiatica</i>	1	100
Shrub (SG)	<i>Leptospermum continentale</i>	0.5	50
Forb (FG)	<i>Drosera spp.</i>	0.1	30
Tree (TG)	<i>Allocasuarina spp.</i>	1	1
Tree (TG)	<i>Eucalyptus spp.</i>	0.5	3
Forb (FG)	<i>Hydrocotyle sibthorpioides</i>	0.1	50
Forb (FG)	<i>Gamochaeta spp.</i>	0.1	15
HTE	<i>Sporobolus fertilis</i>	0.5	50

	# Tree Stems Count	# Hollow Bearing Trees
80+cm	absent	0
50-79cm	absent	0
30-49cm	absent	0
20-29cm	absent	0
10-19cm	absent	0
5-9cm	absent	0
<5cm	present	0

Length of Logs (m)	0
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BAM Attribute (1x1m)	Litter Cover (%)
1 (5m)	10
2 (15m)	10
3 (25m)	10

4 (35m)	10
5 (45m)	20
Average	12

Growth Form	Composition Data (Count of Native Cover)	Structure Data (Sum of Cover)
Tree	2	1.5
Shrub	5	45.5
Grass	3	9
Forb	5	1.4
Fern	0	0
Other	1	0.1
High Threat Exotics	3	1.2

BAM Site – Field Survey Form					
Date:	08.05.2024	Plot ID:	2	Photo #:	0
Zone:	56	Plot Dimensions:	50x20m	Easting:	281309
Datum:	GDA94	Middle bearing from 0m:	70	Northing:	6132762
PCT:	PCT 3269 – Moderate (All Strata Present)				

Growth Form	Scientific Name	Cover	Abundance
Shrub (SG)	<i>Pittosporum undulatum</i>	2	5
Tree (TG)	<i>Corymbia maculata</i>	60	27
Grass & grasslike (GG)	<i>Entolasia stricta</i>	1	60
Grass & grasslike (GG)	<i>Aristida ramosa</i>	1	60
Grass & grasslike (GG)	<i>Microlaena stipoides</i>	1	50
Grass & grasslike (GG)	<i>Cymbopogon refractus</i>	1	50
HTE	<i>Asparagus aethiopicus</i>	0.3	4
Shrub (SG)	<i>Kunzea ambigua</i>	5	25
Forb (FG)	<i>Lagenophora gracilis</i>	0.1	5
Forb (FG)	<i>Lobelia purpurascens</i>	0.2	100
Grass & grasslike (GG)	<i>Paspalidium distans</i>	1	50
Forb (FG)	<i>Gonocarpus spp.</i>	0.2	4
Tree (TG)	<i>Eucalyptus paniculata</i>	5	6
Exotic	<i>Cirsium vulgare</i>	0.1	7
Other (OG)	<i>Parsonsia straminea</i>	0.1	2
Shrub (SG)	<i>Pimelea linifolia</i>	0.2	3
HTE	<i>Senna pendula</i>	1	3
Shrub (SG)	<i>Acacia stricta</i>	1	1
HTE	<i>Araujia sericifera</i>	0.2	2
Grass & grasslike (GG)	<i>Oplismenus spp.</i>	1	25
Shrub (SG)	<i>Lissanthe strigosa</i>	1	10

	# Tree Stems Count	# Hollow Bearing Trees
80+cm	absent	0
50-79cm	one	1
30-49cm	absent	0
20-29cm	present	0
10-19cm	present	0
5-9cm	present	0
<5cm	present	0

Length of Logs (m)	2
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BAM Attribute (1x1m)	Litter Cover (%)
1 (5m)	80

2 (15m)	75
3 (25m)	90
4 (35m)	70
5 (45m)	85
Average	80

Growth Form	Composition Data (Count of Native Cover)	Structure Data (Sum of Cover)
Tree	2	65
Shrub	5	9.2
Grass	6	6
Forb	3	0.5
Fern	0	0
Other	1	0.1
High Threat Exotics	3	1.5

BAM Site – Field Survey Form					
Date:	08.05.2024	Plot ID:	3	Photo #:	0
Zone:	56	Plot Dimensions:	50x20m	Easting:	281520
Datum:	GDA94	Middle bearing from 0m:	15	Northing:	6132944
PCT:	PCT 3269 – Moderate (All Strata Present)				

Growth Form	Scientific Name	Cover	Abundance
Shrub (SG)	<i>Kunzea ambigua</i>	35	150
Grass & grasslike (GG)	<i>Paspalidium distans</i>	2	5
Shrub (SG)	<i>Daviesia ulicifolia</i>	5	7
Shrub (SG)	<i>Acacia stricta</i>	2	2
Forb (FG)	<i>Lagenophora gracilis</i>	0.1	6
Shrub (SG)	<i>Melaleuca decora</i>	10	2
Tree (TG)	<i>Corymbia maculata</i>	20	3
Forb (FG)	<i>Drosera spp.</i>	0.1	25
Forb (FG)	<i>Centella asiatica</i>	0.2	25
Shrub (SG)	<i>Lissanthe strigosa</i>	1	8
Tree (TG)	<i>Eucalyptus globoidea</i>	10	2
HTE	<i>Ageratina adenophora</i>	2	30
Shrub (SG)	<i>Hakea sericea</i>	5	8
Shrub (SG)	<i>Pimelea linifolia</i>	2	7

	# Tree Stems Count	# Hollow Bearing Trees
80+cm	absent	0
50-79cm	absent	0
30-49cm	absent	0
20-29cm	present	0
10-19cm	present	0
5-9cm	present	0
<5cm	present	0

Length of Logs (m)	0
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BAM Attribute (1x1m)	Litter Cover (%)
1 (5m)	85
2 (15m)	75
3 (25m)	70
4 (35m)	90
5 (45m)	70
Average	78

Growth Form	Composition Data (Count of Native Cover)	Structure Data (Sum of Cover)
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Tree	2	30
Shrub	7	60
Grass	1	2
Forb	3	0.4
Fern	0	0
Other	0	0
High Threat Exotics	1	2

BAM Site – Field Survey Form					
Date:	08.05.2024	Plot ID:	4	Photo #:	0
Zone:	56	Plot Dimensions:	50x20	Easting:	281567
Datum:	GDA94	Middle bearing from 0m:	50	Northing:	6133034
PCT:	PCT 3269 – Moderate (All Strata Present)				

Growth Form	Scientific Name	Cover	Abundance
Forb (FG)	<i>Hydrocotyle sibthorpioides</i>	2	100
Shrub (SG)	<i>Lissanthe strigosa</i>	5	12
Forb (FG)	<i>Lagenophora gracilis</i>	0.1	8
Shrub (SG)	<i>Pittosporum undulatum</i>	2	6
Shrub (SG)	<i>Kunzea ambigua</i>	45	75
Forb (FG)	<i>Dichondra repens</i>	0.2	50
Tree (TG)	<i>Corymbia maculata</i>	20	5
Forb (FG)	<i>Centella asiatica</i>	0.2	100
Grass & grasslike (GG)	<i>Cymbopogon refractus</i>	0.5	50
Grass & grasslike (GG)	<i>Microlaena stipoides</i>	0.5	50
HTE	<i>Senna pendula</i>	2	3
HTE	<i>Bidens pilosa</i>	0.1	25
HTE	<i>Ageratina adenophora</i>	1	25
Shrub (SG)	<i>Hakea sericea</i>	5	9
Shrub (SG)	<i>Melaleuca decora</i>	5	5

	# Tree Stems Count	# Hollow Bearing Trees
80+cm	absent	0
50-79cm	absent	0
30-49cm	present	0
20-29cm	present	0
10-19cm	present	0
5-9cm	present	0
<5cm	present	0

Length of Logs (m)	0.5
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BAM Attribute (1x1m)	Litter Cover (%)
1 (5m)	5
2 (15m)	35
3 (25m)	30
4 (35m)	35
5 (45m)	5
Average	22

Growth Form	Composition Data	Structure Data
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	(Count of Native Cover)	(Sum of Cover)
Tree	1	20
Shrub	5	62
Grass	2	1
Forb	4	2.5
Fern	0	0
Other	0	0
High Threat Exotics	3	3.1

BAM Site – Field Survey Form					
Date:	08.05.2024	Plot ID:	5	Photo #:	0
Zone:	56	Plot Dimensions:	50x20m	Easting:	281699
Datum:	GDA94	Middle bearing from 0m:	9	Northing:	6132630
PCT:	PCT 3269 – Low (Reduced Canopy)				

Growth Form	Scientific Name	Cover	Abundance
Shrub (SG)	<i>Melaleuca decora</i>	20	2
Shrub (SG)	<i>Kunzea ambigua</i>	15	25
Shrub (SG)	<i>Melaleuca ericifolia</i>	10	3
HTE	<i>Sporobolus fertilis</i>	10	50
Shrub (SG)	<i>Acacia longifolia</i>	2	2
HTE	<i>Senecio madagascariensis</i>	0.5	8
Exotic	<i>Richea spp.</i>	0.2	50
HTE	<i>Paspalum dilatatum</i>	2	55
Forb (FG)	<i>Drosera spp.</i>	0.1	80
Grass & grasslike (GG)	<i>Lomandra longifolia</i>	1	35
Other (OG)	<i>Parsonsia straminea</i>	0.1	3
Tree (TG)	<i>Allocasuarina spp.</i>	5	4
Shrub (SG)	<i>Hakea sericea</i>	2	4
Grass & grasslike (GG)	<i>Aristida vagans</i>	0.5	50
Grass & grasslike (GG)	<i>Eragrostis brownii</i>	1	150
Tree (TG)	<i>Eucalyptus spp.</i>	1	8

	# Tree Stems Count	# Hollow Bearing Trees
80+cm	absent	0
50-79cm	absent	0
30-49cm	absent	0
20-29cm	absent	0
10-19cm	absent	0
5-9cm	present	0
<5cm	present	0

Length of Logs (m)	2
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BAM Attribute (1x1m)	Litter Cover (%)
1 (5m)	5
2 (15m)	5
3 (25m)	10
4 (35m)	10

5 (45m)	15
Average	9

Growth Form	Composition Data (Count of Native Cover)	Structure Data (Sum of Cover)
Tree	2	6
Shrub	5	49
Grass	3	2.5
Forb	1	0.1
Fern	0	0
Other	1	0.1
High Threat Exotics	3	12.5

BAM Site – Field Survey Form					
Date:	08.05.2024	Plot ID:	6	Photo #:	0
Zone:	56	Plot Dimensions:	50x20m	Easting:	281719
Datum:	GDA94	Middle bearing from 0m:	75	Northing:	6132902
PCT:	PCT 3269 – Low (Reduced Canopy)				

Growth Form	Scientific Name	Cover	Abundance
Shrub (SG)	<i>Melaleuca decora</i>	15	2
Shrub (SG)	<i>Acacia longifolia</i>	5	5
Shrub (SG)	<i>Kunzea ambigua</i>	65	250
Shrub (SG)	<i>Acacia falcata</i>	0.5	3
Forb (FG)	<i>Centella asiatica</i>	0.5	150
Grass & grasslike (GG)	<i>Aristida vagans</i>	0.5	50
HTE	<i>Sporobolus fertilis</i>	0.2	30
HTE	<i>Andropogon virginicus</i>	0.1	25
Forb (FG)	<i>Hydrocotyle sibthorpioides</i>	0.3	100
HTE	<i>Paspalum dilatatum</i>	0.2	25
Tree (TG)	<i>Allocasuarina spp.</i>	1	5
Other (OG)	<i>Glycine clandestina</i>	0.1	10

	# Tree Stems Count	# Hollow Bearing Trees
80+cm	absent	0
50-79cm	absent	0
30-49cm	absent	0
20-29cm	absent	0
10-19cm	present	0
5-9cm	present	0
<5cm	present	0

Length of Logs (m)	0
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BAM Attribute (1x1m)	Litter Cover (%)
1 (5m)	25
2 (15m)	15
3 (25m)	10
4 (35m)	15
5 (45m)	60
Average	25

Growth Form	Composition Data (Count of Native Cover)	Structure Data (Sum of Cover)
Tree	1	1

Shrub	4	85.5
Grass	1	0.5
Forb	2	0.8
Fern	0	0
Other	1	0.1
High Threat Exotics	3	0.5

BAM Site – Field Survey Form					
Date:	08.05.2024	Plot ID:	7	Photo #:	0
Zone:	56	Plot Dimensions:	50x20m	Easting:	281500
Datum:	GDA94	Middle bearing from 0m:	9	Northing:	6132530
PCT:	PCT 3269 – Moderate (All Strata Present)				

Growth Form	Scientific Name	Cover	Abundance
Grass & grasslike (GG)	<i>Microlaena stipoides</i>	2	1000
Tree (TG)	<i>Allocasuarina spp.</i>	1	5
Tree (TG)	<i>Eucalyptus paniculata</i>	15	12
HTE	<i>Lantana camara</i>	1	3
Grass & grasslike (GG)	<i>Lomandra longifolia</i>	2	25
Tree (TG)	<i>Acacia maidenii</i>	0.5	3
Forb (FG)	<i>Dichondra repens</i>	1	1000
	0	0	0
HTE	<i>Sporobolus fertilis</i>	0.5	800
Shrub (SG)	<i>Pittosporum undulatum</i>	5	2
Shrub (SG)	<i>Melaleuca decora</i>	5	8
Other (OG)	<i>Parsonsia straminea</i>	0.1	15
Shrub (SG)	<i>Kunzea ambigua</i>	2	50
Other (OG)	<i>Glycine clandestina</i>	0.1	20
Tree (TG)	<i>Corymbia maculata</i>	35	15
Grass & grasslike (GG)	<i>Oplismenus aemulus</i>	1	500
Grass & grasslike (GG)	<i>Entolasia marginata</i>	1	500
Forb (FG)	<i>Lobelia purpurascens</i>	0.5	500
	0	0	

	# Tree Stems Count	# Hollow Bearing Trees
80+cm	absent	0
50-79cm	absent	0
30-49cm	present	0
20-29cm	present	0
10-19cm	present	0
5-9cm	present	0
<5cm	present	0

Length of Logs (m)	7
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BAM Attribute (1x1m)	Litter Cover (%)
1 (5m)	70
2 (15m)	80
3 (25m)	10
4 (35m)	10

5 (45m)	5
Average	35

Growth Form	Composition Data (Count of Native Cover)	Structure Data (Sum of Cover)
Tree	4	51.5
Shrub	3	12
Grass	4	6
Forb	2	1.5
Fern	0	0
Other	2	0.2
High Threat Exotics	2	1.5



BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00066616/BAAS23028/26/00066617		09/04/2026
Assessor Name	Assessor Number	BAM Data version *
Luke Johnson	BAAS23028	Current classification (live - default) (94)
Proponent Names	Report Created	BAM Case Status
John Lawrence	22/06/2026	Finalised
Assessment Revision	BOS entry trigger	Assessment Type
3		Biocertification
Date Finalised	* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.	
22/06/2026		

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
Illawarra Lowlands Grassy Woodland in the Sydney Basin Bioregion	Endangered Ecological Community	3269-Shoalhaven Lowland Spotted Gum-Paperbark Forest
Species		
Nil		

Assessment Id	Proposal Name	Page 1 of 7
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BAM Biodiversity Credit Report (Like for like)

Additional Information for Approval

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

PCT

No Changes

Predicted Threatened Species Not On Site

Name

No Changes

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

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
3269-Shoalhaven Lowland Spotted Gum-Paperbark Forest	Illawarra Lowlands Grassy Woodland in the Sydney Basin Bioregion	13.5	48	98	146

Assessment Id

Proposal Name

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BAM Biodiversity Credit Report (Like for like)

3269-Shoalhaven Lowland Spotted Gum-Paperbark Forest	Like-for-like credit retirement options					
	Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
	Illawarra Lowlands Grassy Woodland in the Sydney Basin Bioregion This includes PCT's: 3269, 3327, 3330, 4052	-	3269_Moderate	Yes	48	Jervis, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Illawarra Lowlands Grassy Woodland in the Sydney Basin Bioregion This includes PCT's: 3269, 3327, 3330, 4052	-	3269_Low	No	98	Jervis, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

Species	Vegetation Zone/s	Area / Count	Credits
Callocephalon fimbriatum / Gang-gang Cockatoo	3269_Moderate	2.5	48.00
Calyptrorhynchus lathami lathami / South-eastern Glossy Black-Cockatoo	3269_Moderate	2.5	48.00
Cercartetus nanus / Eastern Pygmy-possum	3269_Moderate, 3269_Low	13.5	146.00
Cryptostylis hunteriana / Leafless Tongue Orchid	3269_Moderate, 3269_Low	13.5	109.00

BAM Biodiversity Credit Report (Like for like)

Haliaeetus leucogaster / White-bellied Sea-Eagle	3269_Moderate	2.5	48.00
Heleioporus australiacus / Giant Burrowing Frog	3269_Moderate, 3269_Low	13.5	109.00
Hieraaetus morphnoides / Little Eagle	3269_Moderate	2.5	36.00
Isodon obesulus obesulus / Southern Brown Bandicoot (eastern)	3269_Moderate, 3269_Low	13.5	146.00
Litoria aurea / Green and Golden Bell Frog	3269_Moderate, 3269_Low	13.5	146.00
Lophoictinia isura / Square-tailed Kite	3269_Moderate	2.5	36.00
Myotis macropus / Southern Myotis	3269_Moderate, 3269_Low	13.5	146.00
Pandion cristatus / Eastern Osprey	3269_Moderate	2.5	36.00
Petauroides volans / Southern Greater Glider	3269_Moderate	2.5	48.00
Petaurus norfolcensis / Squirrel Glider	3269_Moderate	2.5	48.00
Phascogale tapoatafa / Brush-tailed Phascogale	3269_Moderate, 3269_Low	13.5	146.00
Phascolarctos cinereus / Koala	3269_Moderate	2.5	48.00
Sminthopsis leucopus / White-footed Dunnart	3269_Moderate, 3269_Low	13.5	146.00

Credit Retirement Options

Like-for-like credit retirement options

Callocephalon fimbriatum / Gang-gang Cockatoo	Spp	IBRA subregion
	Callocephalon fimbriatum / Gang-gang Cockatoo	Any in NSW
Calyptrorhynchus lathami lathami / South-eastern Glossy Black-Cockatoo	Spp	IBRA subregion
	Calyptrorhynchus lathami lathami / South-eastern Glossy Black-Cockatoo	Any in NSW

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BAM Biodiversity Credit Report (Like for like)

Cercartetus nanus / Eastern Pygmy-possum	Spp	IBRA subregion
	Cercartetus nanus / Eastern Pygmy-possum	Any in NSW
Cryptostylis hunteriana / Leafless Tongue Orchid	Spp	IBRA subregion
	Cryptostylis hunteriana / Leafless Tongue Orchid	Any in NSW
Haliaeetus leucogaster / White-bellied Sea-Eagle	Spp	IBRA subregion
	Haliaeetus leucogaster / White-bellied Sea-Eagle	Any in NSW
Heleioporus australiacus / Giant Burrowing Frog	Spp	IBRA subregion
	Heleioporus australiacus / Giant Burrowing Frog	Any in NSW
Hieraaetus morphnoides / Little Eagle	Spp	IBRA subregion
	Hieraaetus morphnoides / Little Eagle	Any in NSW
Isodon obesulus obesulus / Southern Brown Bandicoot (eastern)	Spp	IBRA subregion
	Isodon obesulus obesulus / Southern Brown Bandicoot (eastern)	Any in NSW
Litoria aurea / Green and Golden Bell Frog	Spp	IBRA subregion

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BAM Biodiversity Credit Report (Like for like)

	Litoria aurea / Green and Golden Bell Frog	Any in NSW
Lophoictinia isura / Square-tailed Kite	Spp	IBRA subregion
	Lophoictinia isura / Square-tailed Kite	Any in NSW
Myotis macropus / Southern Myotis	Spp	IBRA subregion
	Myotis macropus / Southern Myotis	Any in NSW
Pandion cristatus / Eastern Osprey	Spp	IBRA subregion
	Pandion cristatus / Eastern Osprey	Any in NSW
Petauroides volans / Southern Greater Glider	Spp	IBRA subregion
	Petauroides volans / Southern Greater Glider	Any in NSW
Petaurus norfolcensis / Squirrel Glider	Spp	IBRA subregion
	Petaurus norfolcensis / Squirrel Glider	Any in NSW
Phascogale tapoatafa / Brush-tailed Phascogale	Spp	IBRA subregion
	Phascogale tapoatafa / Brush-tailed Phascogale	Any in NSW

Assessment Id

Proposal Name

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BAM Biodiversity Credit Report (Like for like)

Phascolarctos cinereus / Koala	Spp	IBRA subregion
	Phascolarctos cinereus / Koala	Any in NSW
Sminthopsis leucopus / White-footed Dunnart	Spp	IBRA subregion
	Sminthopsis leucopus / White-footed Dunnart	Any in NSW



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