Biodiversity Development Assessment Report

84 Gavenlock Road, Mardi NSW 2259

Catholic Schools Broken Bay

June 2025

NARLA
environmental

Report:	Biodiversity Development Assessment Report
Prepared for:	Catholic Schools Broken Bay
Prepared by:	Narla Environmental Pty Ltd
Project no:	SDAR1
Version:	Final v2.0

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Report Certification

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Document Control

Revision	Document Name	Issue Date	Internal Document Review
Draft v1.0	Biodiversity Development Assessment Report – 84 Gavenlock Road, Mardi 2259	29/01/2025	Luke Johnson
Draft v2.0	Biodiversity Development Assessment Report – 84 Gavenlock Road, Mardi 2259	21/03/2025	Luke Johnson
Final v1.0	Biodiversity Development Assessment Report – 84 Gavenlock Road, Mardi 2259	07/04/2025	Luke Johnson
Final v2.0	Biodiversity Development Assessment Report – 84 Gavenlock Road, Mardi 2259	19/06/2025	Luke Johnson

As the accredited assessor, I Luke Johnson, certify that the information presented in this report is a true and accurate record of the study findings in the opinion of the authors.

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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
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
DCCEEW	NSW Department of Climate Change, Energy the Environment and Water
DPE	NSW Department of Planning and Environment
DPIE	NSW Department of Planning, Industry and Environment
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
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
SAII	Serious and Irreversible Impacts

Acronym/ Term	Definition
SAII entity	Species and ecological communities that are likely to be the subject of serious and irreversible impacts (SAIIs)
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.
SSDA	State Significant Development Application
Subject Land	The footprint of the proposed development
Subject Property	84 Gavenlock Road, Mardi 2259 (Lot 9/4/DP3368)
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

Planning Secretary's Environmental Assessment Requirements

	Issue and Assessment Requirements	Relevant Section of this Report
1	**Statutory Context:**	
	Address all relevant legislation, environmental planning instruments (EPIs) (including drafts), plans, policies and guidelines.	Section 1.4 Section 2. Section 10
10	**Biodiversity:**	
	Assess any biodiversity impacts associated with the development in accordance with the Biodiversity Conservation Act 2016 and the Biodiversity Assessment Method 2020, including the preparation of a Biodiversity Development Assessment Report (BDAR), unless a waiver is granted or the site is on biodiversity certified land.	This document.
	If the development is on biodiversity certified land, provide information to identify the site (using associated mapping) and demonstrate the proposed development is consistent with the relevant biodiversity measure conferred by the biodiversity certification.	Not applicable
12	**Ground and Water Conditions:**	
	Assess potential impacts on soil resources and related infrastructure and riparian lands on and near the site, including soil erosion, salinity and acid sulfate soils.	Section 2
	Provide a Surface and Groundwater Impact Assessment that assesses potential impacts on: • surface water resources (quality and quantity) including related infrastructure, hydrology, dependent ecosystems, drainage lines, downstream assets and watercourses. • groundwater resources in accordance with the Groundwater Guidelines.	Section 5

Executive Summary

Narla Environmental Pty Ltd (Narla) was commissioned by Catholic Schools Broken Bay ('the proponent') to prepare a Biodiversity Development Assessment Report (BDAR) to accompany a State Significant Development Application (SSDA) and address the Secretary's Environmental Assessment Requirements (SEARs) for the proposed development at 84 Gavenlock Road, Mardi NSW 2259 (Lot 9/4/DP3368), hereafter referred to as the Subject Property).

This BDAR has assessed the biodiversity impacts of the proposed development 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).

Construction, subdivision and operation of a new Catholic school for 200 students with special needs, comprising 20 general learning areas, flexible specialist learning areas, administration and staff facilities, library, hall, amenities and associated site preparation works, landscaping, play space and on-site car parking and kiss and drop, together with road upgrades for Keefers Glen.

The proposed development will involve the removal of vegetation and the demolition of the existing structures to allow for future development within the Subject Property in line with the E3: Productivity Support zoning which covers the majority of the site. All areas associated with the proposed development will be hereafter referred to as the Subject Land.

Owing to the vegetated nature of the Subject Land and the goals of the project to facilitate future development on the site, complete avoidance of impacts to native vegetation were not possible. The vegetation to be impacted largely consists of native remnant canopy vegetation surrounding a dam.

The proposed development is expected to impact on one (1) Plant Community Types (PCT):

- PCT 4021: Coastal Creekline Fry Shrubby Swamp Forest.

The following ecosystem credits are required to be offset in order to mitigate the impacts upon biodiversity as a result of the proposed development:

- Fourteen (14) ecosystem credits for PCT 4021.

Areas of vegetation identified as PCT 4021 within the Subject Land conforms to the following Biodiversity Conservation Act 2016 (BC Act) listed Endangered Ecological Community:

- Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions

Seven (7) species credit species was assumed present owing to areas of suitable habitat being mapped within the Subject Land. The following species credits are therefore required to be offset in order to mitigate the impacts upon these species as a result of the proposed development:

- 14 credits for *Cercartus nanus* (Eastern Pygmy-possum; Assumed Present);
- 8 credits for *Crinia tinnula* (Wallum Froglet; Assumed Present);
- 10 credits for *Hieraaetus morphoides* (Little Eagle; Assumed Present);
- 14 credits for *Hoplocephalus stephensii* (Stephens' Banded Snake; Assumed Present);
- 8 credits for *Mixophyes iteratus* (Giant Barred Frog; Assumed Present);
- 11 credits for *Myotis macropus* (Southern Myotis; Assumed Present); and
- 14 credits for *Phascogale tapoatafa* (Brush-tailed Phascogale; Assumed Present).

In order to avoid and minimise potential impacts of the proposed development on local biodiversity values, a series of mitigation and management measures have been identified, which are to be implemented as part of any Construction Environmental Management Plan (CEMP) produced for the site. This includes assigning a Project Ecologist to undertake an extensive pre-clearing survey and to supervise the clearing of all vegetation and dam in relation to the proposed development.

1. Introduction

1.1 Overview

Narla Environmental Pty Ltd (Narla) was commissioned by Catholic Schools Broken Bay ('the proponent') to prepare a Streamlined Biodiversity Development Assessment Report (SBDAR) to accompany a State Significant Development Application (SSDA) as part of the Secretary's Environmental Assessment Requirements (SEARs) for the proposed development at 84 Gavenlock Road, Mardi NSW 2259 (Lot 9/4/DP3368), hereafter referred to as the Subject Property (**Figure 1**). The proposed works are subject to SSD approval. Part 4, Division 4.1 of the Environmental Planning and Assessment Act 1979 (EP&A Act) establishes the assessment framework for SSD's. The preparation of this SBDAR is in response to the SEARs issued for the EIS by the NSW Department of Planning and Environment. This BDAR will assess the biodiversity impacts of the proposed development 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 DA 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 Project Description

Catholic Schools Broken Bay (CSBB) is proposing construction of a new school for students with a disability at the purpose-built K-12 Eileen O'Connor Catholic School using land located in the north-western corner of St Peter's Catholic School at 84 Gavenlock Road, Mardi. The school will have capacity for 200 students and will provide education and allied health facilities.

The proposed development involves:

- Tree removal and infill of existing dam;
- Site establishment and benching;
- Construction of a part-two, part-three storey school campus comprising 20 General Learning Areas (GLA), flexible specialist learning areas, library, multipurpose hall, administration, staff facilities, storage, landscaping and playspaces;
- Construction of two (2) new vehicle accessways from Keefers Glen and at-grade carpark (including bus parking) and covered drop off/pick up area;
- Subdivision of land to create a new allotment for the school; and
- Widening of a portion of Keefers Glen.

All areas associated with the proposed development will be hereafter referred to as the Subject Land (**Figure 1**). The Subject Land covers an area of approximately 1.50ha, consisting of existing educational buildings and cleared land, as well as a dam and native remnant vegetation.

1.3 Site Location and Description

The Subject Property is situated within urban landscpae in the suburb of Mardi in the Central Coast Council Local Government Area (LGA; **Figure 2**). It is bounded on the west and south by suburban residential properties, mixed industrial/business to the east, as well as a large patch of remnant bushland on the northern boundary.

The Subject Property is located within the boundaries of the Darkinjung Local Aboriginal Land Councils. It has an area of approximately 13.31ha.

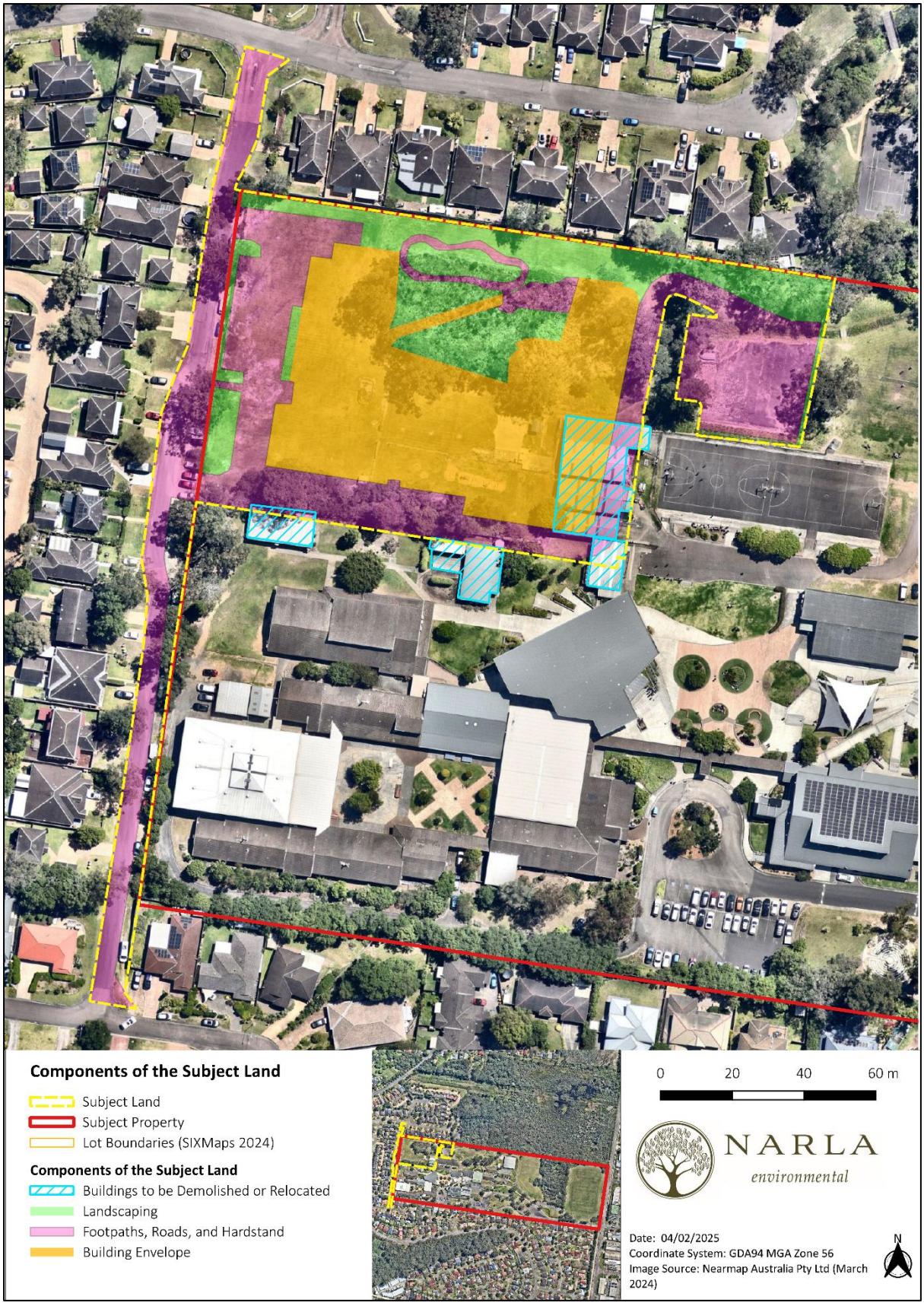

Figure 1. Components of the Subject Land.

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 Central Coast Council LGA, including:

- Relevant State and Commonwealth Databases & Datasets:
    - NSW BioNet. Vegetation Classification System (DCCEEW 2025a);
    - NSW BioNet. The website of the Atlas of NSW Wildlife (DCCEEW 2025b);
    - NSW BioNet. Threatened Biodiversity Data Collection (DCCEEW 2025c); and
    - Six Maps Clip & Ship (NSW Government Spatial Services 2025);
- Vegetation and Soil Mapping:
    - NSW State Vegetation Type Map (DPE 2022).
- 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 (DPE 2023);
    - 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:
    - Central Coast Development Control Plan (DCP) 2022; and
    - Central Coast Local Environmental Plan (LEP) 2022.

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

- Site Demolition Plan (Stanton Dahl Architects 2025);
- Arboricultural Impact Assessment (Bellevue Tree Consultants 2025).

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; DCCEEW 2025b) 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 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 proposed development 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 proposed development.

2. Landscape

2.1 IBRA Bioregion and Subregion

The Subject Land occurs within the 'Wyong' 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 occurs within the 'Gosford – Cooranbong Coastal Slopes' Mitchell Landscape Ecosystem (**Figure 4**). This landscape is characterised by rolling hills and sandstone plateau outliers of Triassic Narrabeen sandstones, extensive rock outcrop and low cliffs along ridge margins, general elevation 0 to 75m. Texture-contrast soils on lithic sandstones and shales. Loamy sand alluvium along creeks. Organic sand and mud in lagoons and swamps. Open forest and woodland of Smooth-barked Apple (*Angophora costata*), Red Bloodwood (*Corymbia gummifera*), Brown Stringybark (*Eucalyptus capitellata*), Sydney Peppermint (*Eucalyptus piperita*), Spotted Gum (*Corymbia maculata*), Bastard Mahogany (*Eucalyptus carnea*), Northern Grey Ironbark (*Eucalyptus siderophloia*) and Grey Gum (*Eucalyptus punctata*) on hills and slopes. Small areas of closed forest with; Turpentine (*Syncarpia glomulifera*), Lilly Pilly (*Acmena smithii*), Mountain Cedar Wattle (*Acacia elata*), Coachwood (*Ceratopetalum apetalum*), Sassafras (*Doryphora sassafras*) and Water Gum (*Tristaniopsis laurina*) in gullies under high escarpments Prickly-leaved Tea-tree (*Melaleuca styphelioides*) and other shrubs with Swamp Mahogany (*Eucalyptus robusta*), Swamp Oak (*Casuarina glauca*), sedges and Common Reed (*Phragmites australis*) on swampy creek flats. Coastal heath subject to salt spray on headlands (Mitchell 2002).

2.3 Topography, Geology and Soils

The Subject Land is located on a gentle north facing slope with the elevation ranging from 31m to 13m above mean sea level (amsl; Google Earth 2025). The Subject Land is mapped as occurring primarily on the 'Woodburys Bridge' and 'Erina' soil landscapes as per the Soil Landscapes of the Gosford-Lake Macquarie 1:100,000 Sheets (Murphy and Tille 1993).

The Woodburys Bridge soil landscape is characterised by broad gently undulating rises and rolling low hills on Patonga Claystone on the Central Coast Lowlands, in the south-east corner of the Hunter Region. Slopes <20 %, local relief 40 - 80 m, elevation 10 - 70 m. Sandstone capping on crests of steeper hills is common. The geology is Narrabeen Group - Clifton Subgroup - Patonga Claystone Formation: red brown and light coloured claystone and siltstone with some sandstone.

The Erina soil landscape is characterised by Gently undulating rises to rolling low hills on the Terrigal Formation in the south east of the Hunter Region and extending south into the Hawkesbury Nepean catchment. Slopes <25%, local relief <60 m, elevation 1 – 155 m. The geology is Terrigal Formation of the Narrabeen Group, consisting of lithic and quartz sandstone and siltstone, minor sedimentary breccia, claystone and conglomerate. Some sandstones are highly weathered and friable.

The Subject Land did not contain any areas of geological significance, such as karsts, caves, cliffs or crevices. The Subject Land is mapped as occurring on Class 4 and 5 Acid Sulphate Soils according to the Central Caast Council LEP 2022 (**Figure 5**).

2.4 Hydrology

The Subject Land intersects one unmapped drainage channel and dam however no mapped streams or watercourses are located within the Subject Property. Another dam is mapped as occurring in the broader Subject Property (**Figure 6**). A number of mapped watercourses and associated riparian buffer zones occur within the 1,500m buffer surrounding the Subject Land, ranging from 1st to 3rd order streams (**Figure 7**).

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.

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 391ha within the buffer circle (total area = 822ha) and was 48% and assigned to the >30% - 70% class.

Large, continuous areas of habitat connectivity that may facilitate the movement of threatened species were evident within the 1,500m surrounding the Subject Land (**Figure 8**).

2.7 Areas of Outstanding Biodiversity Value

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

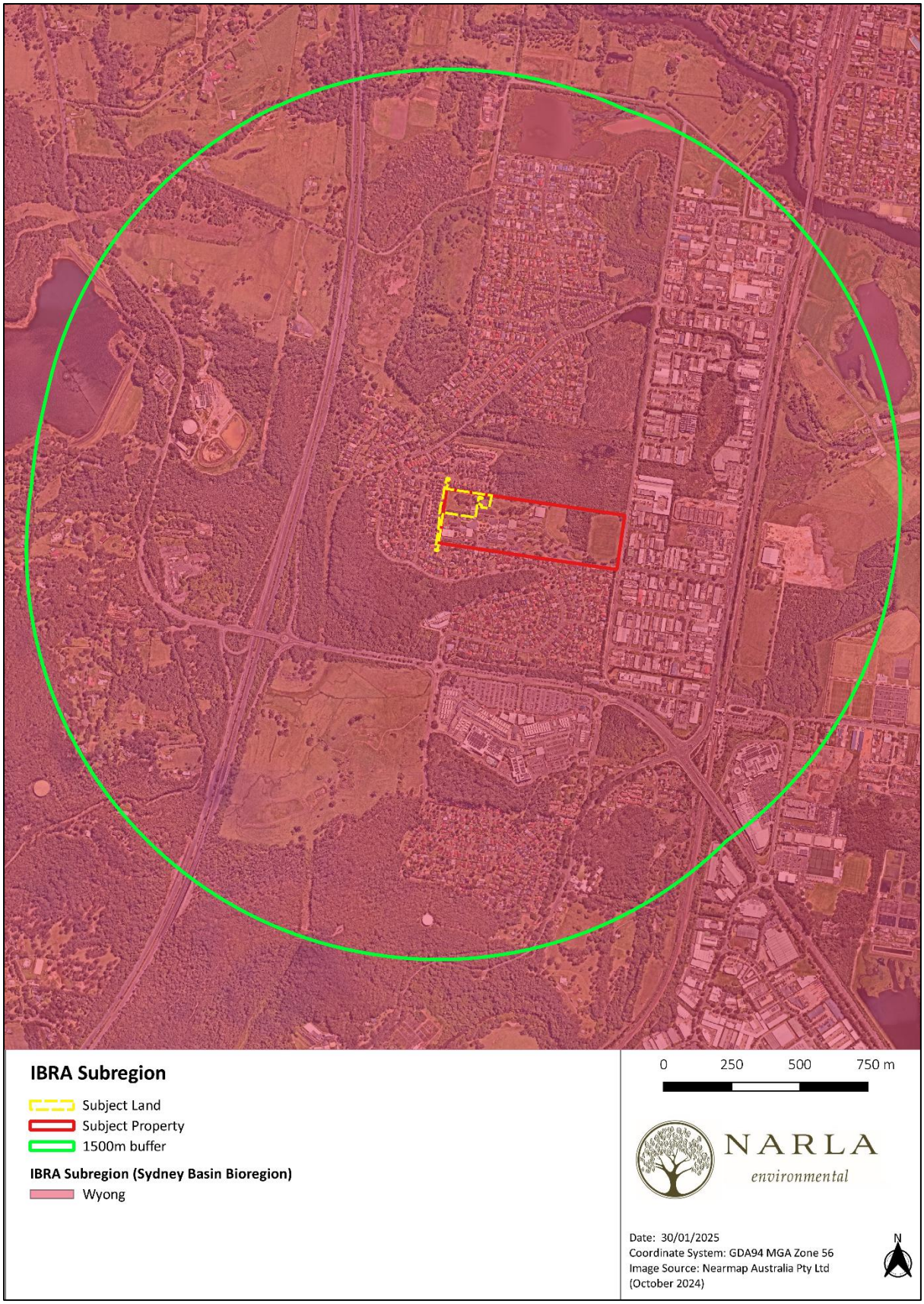

Figure 3. IBRA Bioregion and Subregion of the Subject Property, Subject Land and within a 1,500m buffer.

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

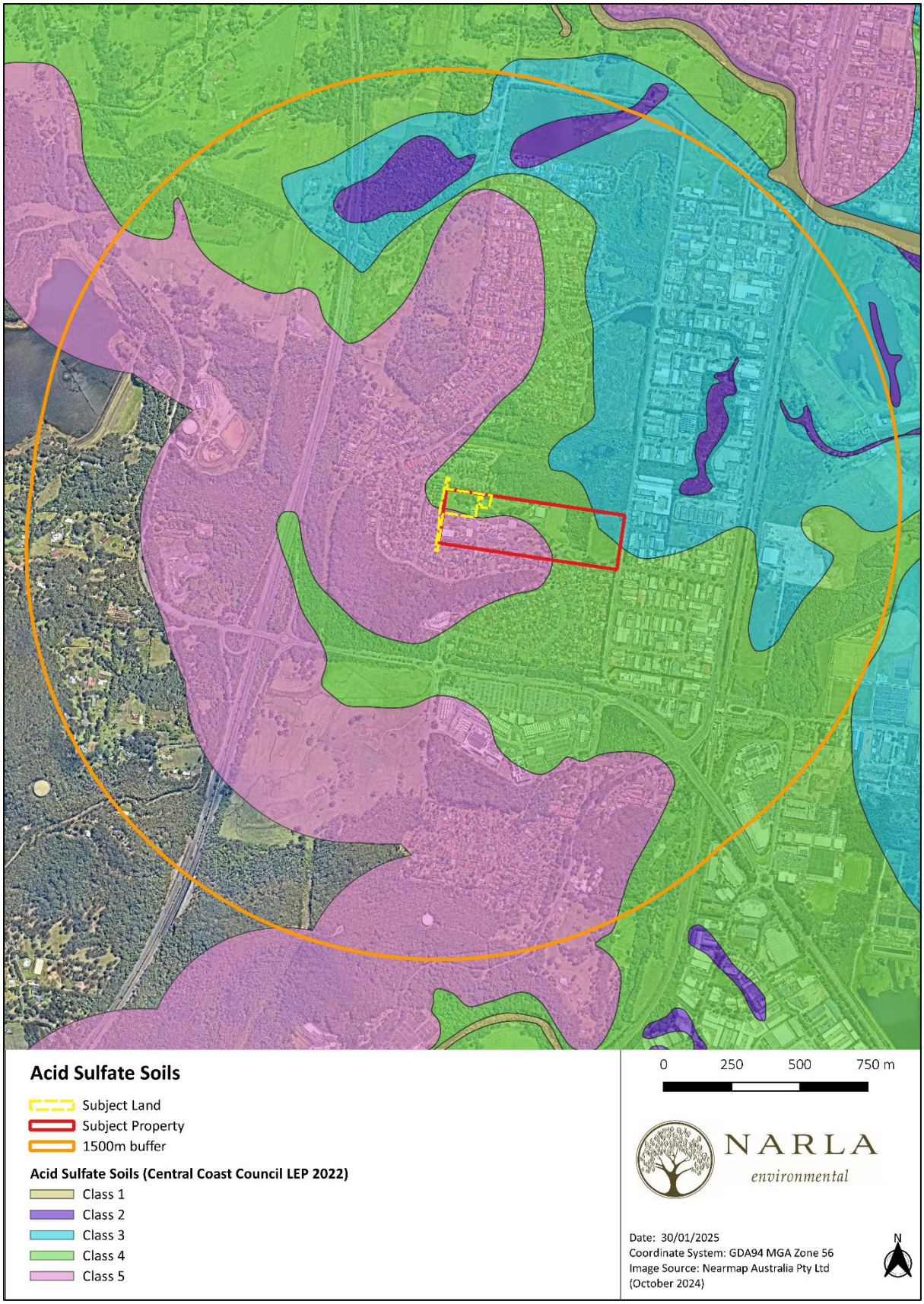

Figure 5. Acid sulphate soil classes in proximity to the Subject Land.

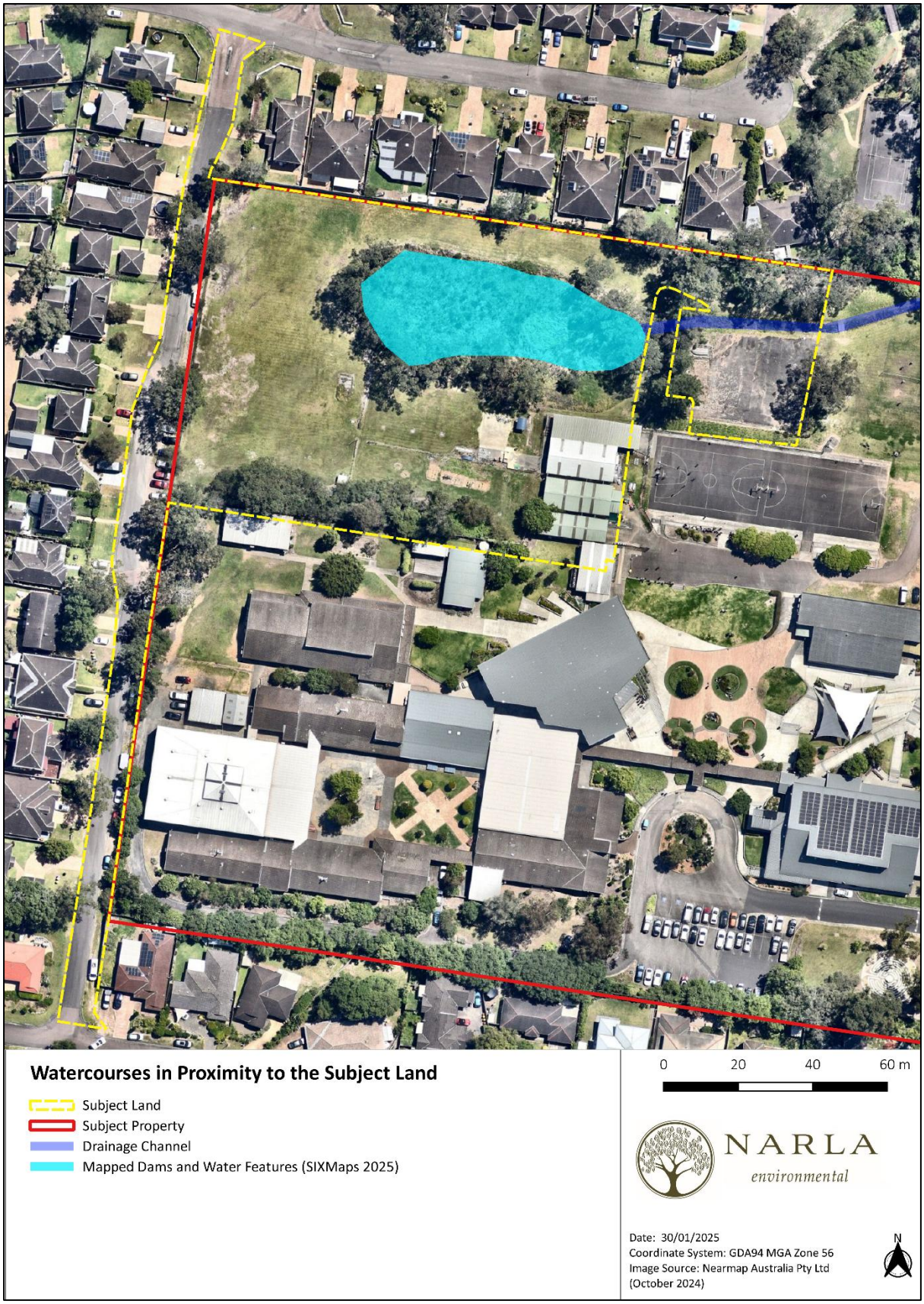

Figure 6. Watercourses and waterbodies within and surrounding the Subject Land.

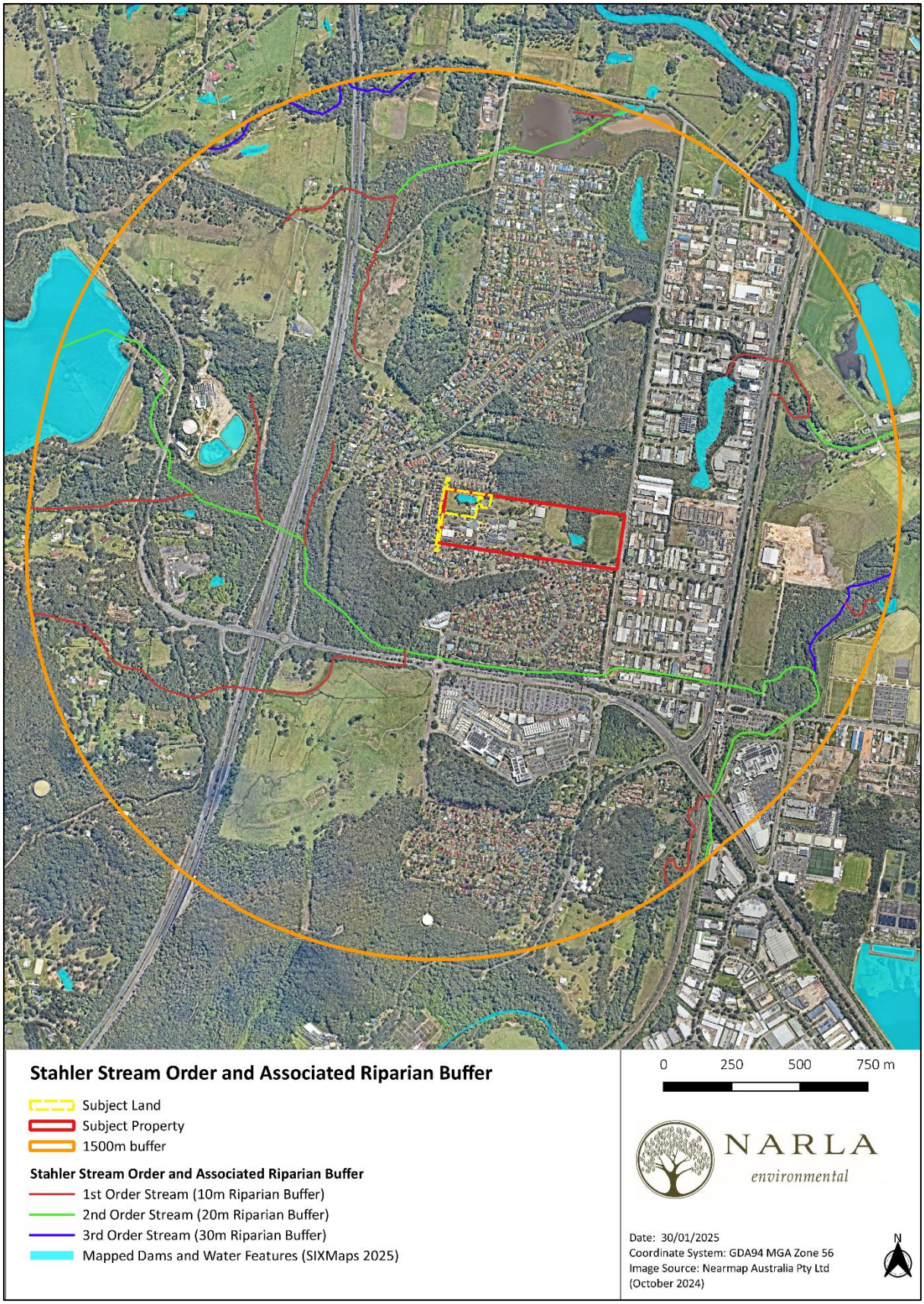

Figure 7. Rivers and streams (with associated riparian buffers) occurring within the 1,500m buffer.

Figure 8. 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 (DPE 2022a) identified areas of non-native vegetation across the entire subject Land and Property. However, the following native vegetation communities have been mapped surrounding the Subject Property:

- PCT 3242: Lower North Ranges Turpentine Moist Forest;
- PCT 2250: Northern Foothills Blackbutt Grassy Forest;
- PCT 4020: Coastal Creekflat Layered Grass-Sedge Swamp Forest;
- PCT 4028: Estuarine Swamp Oak Twig-rush Forest; and
- PCT 4042: Lower North Riverflat Eucalypt-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 (DCCEEW 2025b). The following selection criteria were used in the PCT Filter Tool (DCCEEW 2025f) to develop the PCT shortlist.

3.1.2.1 Vegetation Community 1

- IBRA Bioregion: Sydney Basin Bioregion
- IBRA Subregion: Wyong
- Dominant Species: *Angophora costata, Eucalyptus robusta, Melaleuca nodosa and Pultenaea blakelyi*

This process delivered a selection of six (6) PCT's that occur within the Wyong 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 two (2) 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.**

Table 1. Vegetation Community 1: Output from the PCT Filter Tool (DPE 2023f) 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 floristic Matches	*Angophora costata*	*Eucalyptus robusta*	*Melaleuca nodosa*	*Pultenaea blakelyi*
PCT 3983: Central Coast Flats Mesic Swamp Forest	Yes. This PCT is known to occupy very low elevations of less than 30 metres asl in very wet coastal zones and occurs on clay rich alluvium. This vegetation zone within the Subject Land is located on low-lying alluviums within this distribution	4	√	√	√	√
PCT 3986: Coastal Sands Swamp Mahogany Rush Forest	No. This PCT is found on poorly drained low-lying sandy alluviums and marine sand swales between the Shoalhaven region and the Tweed River. This vegetation zone within the Subject Land is not located on marine sands.	4	√	√	√	√
PCT 3995: Hunter Coast Paperbark-Swamp Mahogany Forest	No. This is PCT is known to occur in coastal lowland inundated freshwater swamps between Gosford and Port Stephens, Hunter coast. Mainly situated in sand swales and depressions along low-lying Quaternary sand plains below 10 metres asl across the Tomago Peninsula. This vegetation zone within the Subject Land is >10m asl.	4	√	√	√	√
PCT 4006: Northern Paperbark-Swamp Mahogany Saw-sedge Forest	No. This PCT is occurs on very low-lying alluvium, estuarine deposits, back barrier flats, back swamps and rarely sand swales, at elevations almost always below 20 metres asl. It is mainly constrained to within a few kilometres of the coastline, although spatial outliers occur on coastal floodplains that extend some way inland. The Subject Land is located approximately 9km from the coast.	4	√	√	√	√
PCT 4021: Coastal Creekline Dry Shrubby Swamp Forest	Yes. This PCT occupies drier elevated parts of coastal alluvial flats in creek headwaters, narrow drainage channels and margins of swamps. This vegetation zone within the Subject Land is located on suitable geology on the margin of swamps.	4	√	√	√	√
PCT 4047: Northern Swamp Mahogany-Bottlebrush Swamp Forest	No. This PCT is found between Coffs Harbour and Newcastle. The Subject Land is not located within this distribution.	4	√	√	√	√

Table 2. Vegetation Community 1: PCT selection criteria. Green indicates the selected PCT.

Candidate PCT	PCT Description (DPE 2023b)	Justification
PCT 3983: Central Coast Flats Mesic Swamp Forest	A restricted tall to very tall sclerophyll open forest with a sub-canopy of Melaleuca trees, mesophyll small trees, shrubs and climbers and a ground layer of sedges and ferns on low-lying alluvial soils on the Central Coast. The tree canopy is very frequently exclusively dominated by *Eucalyptus robusta*, which is rarely replaced or accompanied by other eucalypts such as *Eucalyptus saligna* or *Eucalyptus deanei*. A mid-high to tall sub-canopy is characterised by a high cover of Melaleuca species of which *Melaleuca biconvexa* is very frequently the most abundant, however is commonly accompanied (or very rarely replaced) by *Melaleuca linariifolia* and occasionally *Melaleuca styphelioides*. The climber *Parsonsia straminea* is almost always present on the trunks of the sub-canopy trees. Other common small trees in the sub-canopy include a sparse cover of *Glochidion ferdinandi*, *Callistemon salignus* or palms *Livistona australis* or rarely *Archontophoenix cunninghamiana*. Lower shrubs include *Ficus coronata* and *Pittosporum undulatum*. The ground layer very frequently includes a high cover of *Gahnia clarkei*, which is characteristic of this community, and the fern *Hypolepis muelleri*, accompanied by smaller sedges such as *Carex appressa* and grasses including *Oplismenus imbecillis*. This PCT has a narrow, restricted distribution between Gosford and Wyong, with a small number of northern locations on the margins of the Lake Macquarie district. It occupies very low elevations of less than 30 metres asl in very wet coastal zones, on periodically inundated clay-rich alluviums sourced from the surrounding Narrabeen shale and sandstone hills and ranges. This community has weak floristic overlap with other PCTs in NSW, however it grades into PCT 4028 at elevations of below 10 metres asl or where brackish water inundates	Narla have NOT assigned this PCT to the vegetation within the Subject Land. Whilst it comprises a number of diagnostic species, it was not chosen as the "best fit" PCT as this PCT is described as having a mid-stratum that is almost always very sparse. The mid-stratum, where not historically cleared, within this vegetation zone was dense. This PCT also fails to account for the high presence of *Angophora costata*.

Candidate PCT	PCT Description (DPE 2023b)	Justification
	the alluvial soils. On adjoining sites with better drained soils, it grades into PCT 3025.	
PCT 4021: Coastal Creekline Dry Shrubby Swamp Forest	A tall to very tall dry swampy sclerophyll open forest with a layered mid-stratum of Melaleucas and dry shrubs with a ground cover of tall sedges found on low-lying flats on the Shoalhaven, Illawarra, Central and lower north coasts. The tree canopy includes a wide variety of coastal eucalypt species with *Eucalyptus robusta* commonly recorded with *Eucalyptus resinifera* and *Angophora costata* also common north of Gosford. Occasional local stands are dominated by *Eucalyptus pilularis* in association with *Angophora floribunda*, however species vary between the north and south of the distribution. The consistent floristic attributes are found in the layered mid-stratum and ground cover species. Typically, a sparse to mid-dense taller layer of Melaleuca linariifolia very frequently occurs with a lower layer of *Acacia longifolia*, *Glochidion ferdinandi*, *Leptospermum polygalifolium*, *Dodonaea triquetra* and *Banksia spinulosa*. Other occasional shrubs include *Breynia oblongifolia*, *Acacia irrorata* or the taller *Callistemon salignus*. The ground layer almost always includes a high cover of *Gahnia clarkei*, with *Dianella caerulea* and *Entolasia stricta* and very frequently *Pteridium esculentum*, *Lomandra longifolia* and *Imperata cylindrica*. Smaller sedge species are rare in this PCT. This PCT occupies drier elevated parts of coastal alluvial flats in creek headwaters, narrow drainage channels and margins of swamps where soils are less frequently inundated. It grades into a grassier swamp forest PCT 4020 with increasing elevation on richer alluvial soils.	Narla have assigned this PCT to the vegetation within the Subject Land. As It comprises of several diagnostic species, it was chosen as the "best fit" PCT as this vegetation onsite contained all the diagnostic canopy species as well and several shrub and ground cover. it is described as almost always having a high cover of *Gahnia clarkei. Gahnia clarkei* was identified within this vegetation zone.

3.1.3 Final PCT and Vegetation Zone Selection

The field survey conducted by experienced Narla Ecologists confirmed the presence of one (1) PCTs in addition to areas of landscaped and exotic vegetation within the Subject Land:

- PCT 4021: Coastal Creekline Dry Shrubby Swamp Forest.

Three (3) vegetation zones were identified within the Subject Land that consisted of differing condition classes or vegetation types:

- Vegetation Zone 1: PCT 4021 - Moderate condition (Remnant Canopy);
- Vegetation Zone 2: PCT 4021 - Low condition (Planted); and
- Vegetation Zone 3: Landscaped and Exotic vegetation.

These vegetation zones are detailed in **Table 3** and **Table 4** and displayed in **Figure 9.**

Table 3. PCT 4021 identified within the Subject Land.

PCT 4021: Coastal Creekline Dry Shrubby Swamp Forest		
Vegetation Class	Coastal Floodplain Wetlands	
Total Area within the Subject Land	0.50ha	
Condition Class	**Moderate condition (Remnant)**	**Low Condition (Planted)**
Vegetation Zone	**1**	**2**
Extent within Subject Land (approximate)	0.35ha	0.15ha
Field survey effort	One (1) 20mx50m VIS plot was established.	One (1) 20mx50m VIS plot was established.
Description of vegetation	The vegetation within this zone consisted of remnant canopy species over a dense shrub layer, and a ground layer comprised of numerous grass and forb species (**Plate 1**). The zone encompasses the existing and drainage channel. The canopy species within this zone consisted of *Angophora costata, Eucalyptus robusta* and stands of *Casuarina glauca. S*hrubs species present were *Melaleuca nodosa*, *Acacia longifolia* and *pultenaea blakelyi*. The ground layer consisted of numerous grass and forb species *Gahnia clarkei* and *Imperata cylindrica* was dominant with lower covers of *Lomandra longifolia, Commelina cyanea, Digitaria didactyla, Gonocarpus micranthus,* and *Microlaena stipoides.*	This species consisted of a historically cleared land with mature planted native vegetation (**Plate 2**) either within a garden bed or along the road reserve. The canopy layer was dominated by *Eucalyptus robusta* and *Angophora costata* with smaller individuals of small trees and shrubs such as *Casuarina glauca*, *Acacia floribunda* and *Melaleuca nodosa*. The groundlayer was dominated by *Microlaena stipoides* with several commonly occuring exotic species such as *Lantana camara* and *Cenchrus clandestinus* starting to form large patches.

PCT 4021: Coastal Creekline Dry Shrubby Swamp Forest		
Structure of vegetation	Moderate canopy cover was evident within the VIS plot, with native trees totalling 25.5% cover. Shrub cover was low to moderate totalling 10%. Native groundcover was high to including 59.4% grasses, 2.4% forbs, 0% ferns and 8% other. A low to moderate cover of leaf litter (24%) was apparent. High Threat Exotics (HTEs) were identified at moderate densities covering 6.2%. Fallen logs were absent. The VIS plot contained a low to moderate diversity of tree stem sizes, with zero (0) large trees present (>50cm DBH). Regenerating stems were observed and no hollow bearing trees were recorded.	Canopy cover was moderate within the VIS plot at 30%, with a high shrub cover at 65%. Native groundcover was moderate including 27% grasses, 3.2% forbs, 10% ferns and 2% other. A high coverage of leaf litter (77%) was apparent. High Threat Exotics were identified at moderate densities covering 8.2%. 0m of fallen logs was recorded. The VIS plot contained regenerating stems however only one (1) other tree stems classes were recorded, and no hollows.
TEC Status (BC Act 2016)	This vegetation zone conforms to the Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions – Endangered Ecological Community (See **Section 3.2.1**)	This vegetation zone conforms to the Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions – Endangered Ecological Community (See **Section 3.2.1**)
TEC Status (EPBC Act 1999)	This vegetation zone does not conform to the Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions – Endangered Ecological Community (See **Section 3.2.2**)	This vegetation zone does not conform to the Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions – Endangered Ecological Community (See **Section 3.2.2**)
Scientific Reference from VIS (DPE 2023b)	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 DPIE, Parramatta;	

Table 4. Landscaped and Exotic Vegetation identified within the Subject Land.

Landscaped and Exotic vegetation	
Total area within the Subject Land (approximate)	0.64ha
Vegetation Zone	3
Field Survey Effort	No VIS plots were established owing to the exotic nature of this zone.
Description of vegetation within the Subject Land	The vegetation within this zone largely consisted of the exotic trees such as *Pyrus calleryana* and *Fraxinus oxycarpa* and areas of exotic lawn dominated by *Cenchrus clandestinus* and *Stenotaphrum secundatum* (Plate 3).
Justification of vegetation assignment	The vegetation within this zone comprised planted exotic species. The vegetation does not conform to a locally occurring PCT and was therefore classified as 'Landscaped and Exotic vegetation'.
TEC Status (BC Act 2016)	None.
TEC Status (EPBC Act 1999)	No Associated TEC

Plate 1.Representative photo of Vegetation Zone 1: PCT 4021 Moderate condition (Remnant) within the Subject Land.

Plate 2. Representative photo of Vegetation Zone 2: PCT 4021 Low condition (Planted) within the Subject Land.

Plate 3. Representative photo of Vegetation Zone 3: Landscaped and Exotic Vegetation within the Subject Land.

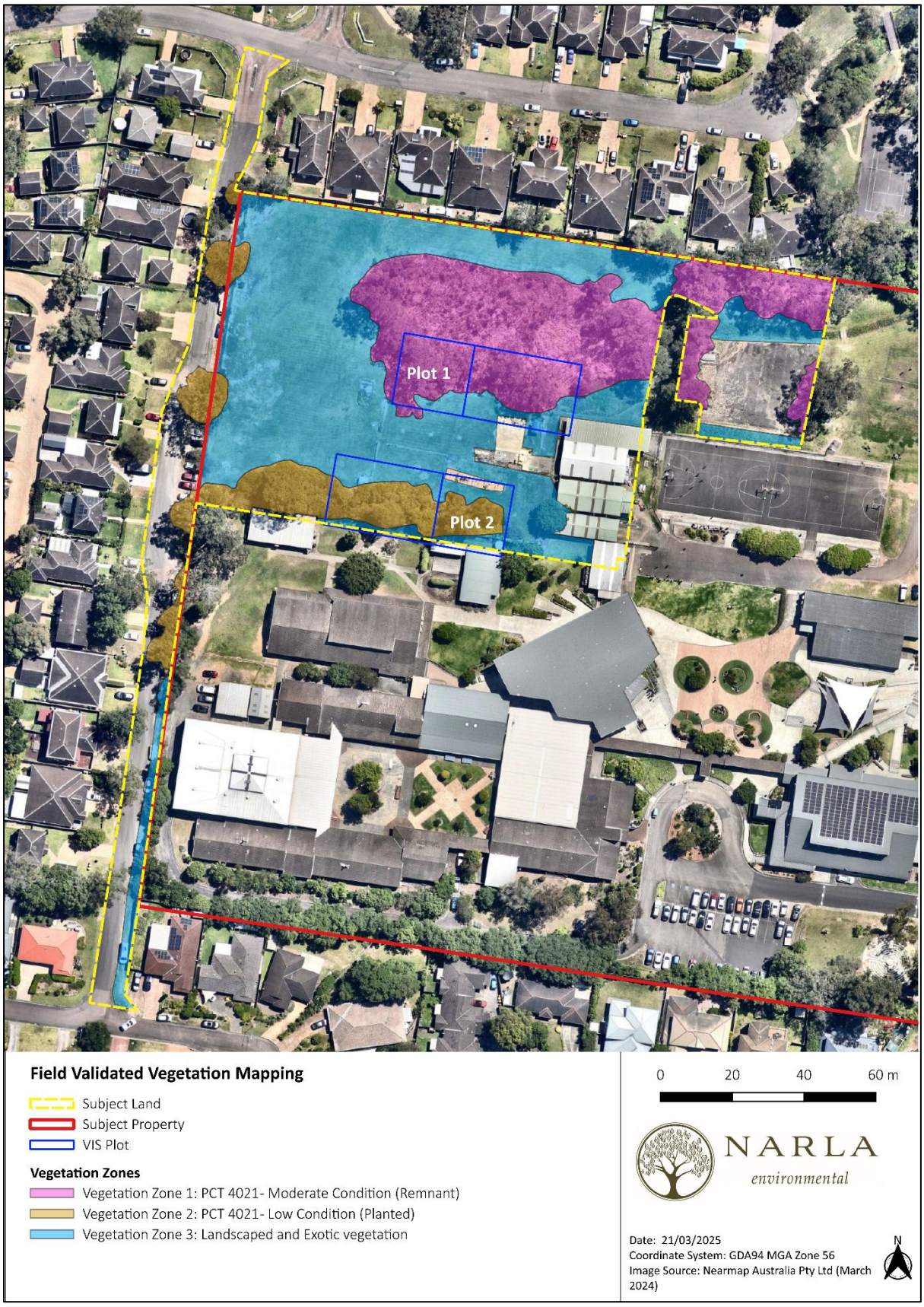

Figure 9. Narla field validated vegetation mapping and location of VIS plots within the Subject Property.

3.2 Threatened Ecological Communities

3.2.1 Biodiversity Conservation Act 2016

3.2.1.1 Swamp sclerophyll forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions

PCT 4021 is associated with the BC Act listed EEC, Swamp sclerophyll Forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions (SSF). Both Vegetation Zones (Zone 1 and 2) within the Subject Land do the BC Act listing for the EEC as it contains species indicative of this EEC and occurs on the associated geology and landscape position (NSW Scientific Committee 2011a).

3.2.2 Environmental Protection and Biodiversity Conservation Act 1999

3.2.2.1 Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions

In order to be protected as a matter of national environmental significance areas of the ecological community must meet both:

- The key diagnostic characteristics listed in the approved conservation advice (DAWE 2021; **Table 5**); and
- Meet at least the minimum condition thresholds outlined in the approved conservation advice (DCCEEW 2022).

Vegetation Zones 1 and 2 were found to be part of the same patch within the Subject Land and have therefore been assessed together to determine if they meet the requirements for listing as this EEC under the EPBC Act. Vegetation Zones 1 and 2 were found not to meet all of the key diagnostic characteristics listed in the approved conservation advice (DCCEEW 2022; **Table 5**).

Table 5. Key Diagnostics Characteristics required to meet the EPBC Listing Status for 1.1.1.1 Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions (DCCEEW 2022).

Key Diagnostic Characteristic	Criteria met? (Vegetation Zones 1 and 2)
It occurs in the New South Wales North Coast (NNC) and South Eastern Queensland (SEQ) IBRA2 bioregions, and on Curtis Island in the Brigalow Belt North IBRA Bioregion (BBN)	No. The Subject Land is situated within Sydney Basin Bioregion.
It occurs in the catchments of the eastern watershed of the Great Dividing Range, typically in their lower reaches.	Yes. The Subject Land occurs in a coastal catchment below 20m asl.
It occurs at elevations up to 250 m above sea-level (ASL), most typically below 50 m ASL.	Yes. The Subject Land occurs in a coastal catchment below 50m asl.
It occurs on alluvial landforms including river floodplains, riparian zones (e.g., along riverbanks, lake foreshores and creek lines), the floors of tributary gullies, floodplain pockets, alluvial flats, fans, terraces, and localised colluvial fans; as well as on localised depressions amongst low rises and on associated sites where water can pond (refer to Section 1.2.1 and Appendix D – Landforms and soils).	Yes. The Vegetation Zones occur along a riparian zone .
It occurs on alluvial soils of various textures including silts, clay loams, sandy loams, gravel and cobbles	Partial. The Vegetation Zones do not occur on alluvial soil however alluvial soil is mapped within 20m of the vegetation.
It does not typically occur on soils that are primarily marine or aeolian sands, but may occur on such substrates after they have been modified by fluvial activity	Yes. Soil mapping is not marine or aeolian sands.
It occurs as a tall closed-forest, tall open-forest, closed forest, open forest, tall woodland, or woodland (Specht 1970). The canopy has a crown cover of at least 20%.	Yes. The crown cover of both vegetation zones is >20%.
It has a canopy dominated by one or a combination of Angophora, Corymbia, Eucalyptus, Lophostemon and/or Syncarpia tree species, but NOT dominated by Eucalyptus robusta (swamp mahogany). Other canopy tree species may be present, and in some areas rainforest trees may be prominent.	No. The Vegetation Zones are both dominated by Eucalyptus robusta.

Table 6. Condition thresholds - Approved Conservation Advice (DCCEEW 2022).

<table>
<tr><th colspan="2">Patch size thresholds →
Biotic thresholds ↓</th><th colspan="2">Large patch
Patch size ≥2 ha</th><th>Small contiguous[4] patch ≥ 0.5 ha, within a larger area of native vegetation ≥ 5 ha</th></tr>
<tr><th>Vegetation</th><th>Arboreal mammals</th><th colspan="2">Small patch
Patch size ≥ 0.5 ha</th></tr>
<tr><td>HIGH CONDITION
Ground cover richness[1] ≥ 10 native species per sample plot
AND
≥ 20 large native trees[2] per ha.
AND
≥ 80% of its total perennial understorey vegetation cover[3] comprises native species</td><td></td><td colspan="2">CLASS A1
Large or contiguous[4] patch, with high quality understorey and many large native trees</td><td>CLASS B1
Small patch, with high quality understorey and many large native trees</td></tr>
<tr><td rowspan="2">GOOD CONDITION
Ground cover richness[1] ≥ 6 native species per sample plot
AND
≥ 10 large native trees[2] per ha.
AND
≥ 50% of its total perennial understorey vegetation cover[3] comprises native species</td><td>AND
≥5 species of arboreal mammals[5] detected[6] in the patch.</td><td colspan="2">CLASS A2
Large or contiguous[4] patch, with good quality understorey, large native trees and evidence of many arboreal mammal species</td><td>CLASS B2
Small patch, with good quality understorey, large native trees and evidence of arboreal mammals</td></tr>
<tr><td></td><td colspan="2">CLASS B3
Large or contiguous[4] patch, with good quality understorey and large native trees</td><td>CLASS C1
Small patch, with good quality understorey and large native trees</td></tr>
<tr><td>MODERATE CONDITION
Ground cover richness ≥ 4 native species per sample plot[1]
AND at least one of:
≥ 6 very large native trees[7] per ha
AND/OR
≥ 30% of its total perennial understorey vegetation cover[3] comprises native species</td><td></td><td colspan="2">CLASS C2
Large or contiguous[4] patch, with moderate quality understorey and/or some very large native trees</td><td>Not nationally protected</td></tr>
</table>

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 ≤ 30m 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:

- <5ha;
- 5 – <25ha;
- 25 – <100 ha; or
- ≥100 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 Land and 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 (**Table 7**; **Figure 10**):

- Woody Ecosystems:
    - Vegetation Zone 1: PCT 4021 - Moderate condition (Remnant); and
    - Vegetation Zone 2: PCT 4021 - Low condition (Planted).

Table 7. Patch size classes of each PCT and associated vegetation zones

Plant Community Type	Category	Vegetation Zone	Patch Size Class
PCT 4021	Woody Ecosystems	Zones 1 and 2	>100ha

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

Two (2) BAM VIS plots were established within the Subject Property. Plots 1 and 2 were 20mx50m in dimension.

Plot data gathered for each attribute used to assess the function of the Subject Land vegetation is detailed in **Appendix B**. Vegetation Integrity (VI) Scores represented by existing vegetation within each vegetation zone is detailed in **Table 8**.

3.4.1 Determining Future Vegetation Integrity Scores

Most projects will result in complete clearing of vegetation and threatened species habitat within the development 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 proposed development. 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 4021 - Moderate condition (Remnant):
    - Management Zone 1: PCT 4021 – Moderate Condition (Remnant) – Complete Removal.
- Vegetation Zone 2: PCT 4021 – Low condition (Planted):
    - Management Zone 2: PCT 4021 – Low Condition (Planted) – Complete Removal.

The attributes influencing future vegetation scores within each of these management zones are detailed in **Table 9**. Owing to the exotic nature of the vegetation within Vegetation Zone 3, it not been assigned to a management zone and will not require further assessment.

Figure 11. Management zones within the Subject Land

Table 8. Vegetation integrity scores for each identified zone from the BAM C (DPE 2023e).

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 4021 – Moderate condition (Remnant)	1 – Complete removal	0.35	One (1) 1,000m^2 (20mx50m) VIS Plot	59.1	90.1	41.4	60.4	0	-60.4	-60.4	Absent
Zone 2: PCT 421 – Low condition (Planted)	2 – Complete removal	0.13	One (1) 1,000m^2 (10mx100m) VIS Plot	36.8	63.3	32.2	42.1	0	-42.1	-42.1	Absent

Table 9. 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 4021 – Moderate condition (Remnant)	1 – Complete removal	All vegetation will be removed	N/A	All vegetation within this zone requires removal to facilitate the proposed development. Future composition, structure and function score is 0.
Zone 2: PCT4021– Low condition (Planted)	2 – Complete removal	All vegetation will be removed	N/A	All vegetation within this zone requires removal to facilitate the proposed development. 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 10.** No species predicted by the BAM calculator as potential ecosystem credits were excluded from the assessment due to habitat constraints.

Table 10. Candidate ecosystem credits predicted to occur within the Subject Land.

Scientific Name	BC Act Status	Sensitivity to Gain	Excluded from Assessment	Reason for Exclusion from Assessment
Anseranas semipalmata Magpie Goose	Vulnerable	Moderate	No	-
Anthochaera phrygia Regent Honeyeater (Foraging)	Critically Endangered	High	No	-
Artamus cyanopterus cyanopterus Dusky Woodswallow	Vulnerable	Moderate	No	-
Botaurus poiciloptilus Australasian Bittern	Endangered	Moderate	No	-
Callocephalon fimbriatum Gang-gang Cockatoo (Foraging)	Endangered	Moderate	No	-
Calyptorhynchus lathami Glossy Black-Cockatoo (Foraging)	Vulnerable	High	No	-
Chthonicola sagittata Speckled Warbler	Vulnerable	High	No	-
Circus assimilis Spotted Harrier	Vulnerable	Moderate	No	-
Climacteris picumnus victoriae Brown Treecreeper (eastern subspecies)	Vulnerable	High	No	-
Daphoenositta chrysoptera Varied Sittella	Vulnerable	Moderate	No	-
Dasyurus maculatus Spotted-tailed Quoll	Vulnerable	High	No	-
Ephippiorhynchus asiaticus Black-necked Stork	Endangered	Moderate	No	-
Falco subniger Black Falcon	Vulnerable	Moderate	No	-
Falsistrellus tasmaniensis Eastern False Pipistrelle	Vulnerable	High	No	-
Glossopsitta pusilla Little Lorikeet	Vulnerable	High	No	-
Haliaeetus leucogaster White-bellied Sea-Eagle (Foraging)	Vulnerable	High	No	-
Hieraaetus morphnoides Little Eagle (Foraging)	Vulnerable	Vulnerable	No	-

Scientific Name	BC Act Status	Sensitivity to Gain	Excluded from Assessment	Reason for Exclusion from Assessment
Hirundapus caudacutus White-throated Needletail	Vulnerable (EPBC Act Only)	High	No	-
Lathamus discolor Swift Parrot (Foraging)	Endangered	Moderate	No	-
Lophoictinia isura Square-tailed Kite (Foraging)	Vulnerable	Moderate	No	-
Micronomus norfolkensis Eastern Coastal Free-tailed Bat	Vulnerable	High	No	-
Miniopterus australis Little Bent-winged Bat (Foraging)	Vulnerable	High	No	-
Miniopterus orianae oceanensis Large Bent-winged Bat (Foraging)	Vulnerable	High	No	-
Neophema pulchella Turquoise Parrot	Vulnerable	High	No	-
Pandion cristatus Eastern Osprey (Foraging)	Vulnerable	Moderate	No	-
Phoniscus papuensis Golden-tipped Bat	Vulnerable	High	No	-
Pomatostomus temporalis temporalis Grey-crowned Babbler (eastern subspecies*)*	Vulnerable	Moderate	No	-
Pseudomys gracilicaudatus Eastern Chestnut Mouse	Vulnerable	High	No	-
Pteropus poliocephalus Grey-headed Flying-fox (Foraging)	Vulnerable	High	No	-
Rostratula australis Australian Painted Snipe	Endangered	Moderate	No	-
Saccolaimus flaviventris Yellow-bellied Sheathtail-bat	Vulnerable	High	No	-
Scoteanax rueppellii Greater Broad-nosed Bat	Vulnerable	High	No	-
Varanus rosenbergi Rosenberg's Goanna	Vulnerable	High	No	-

4.2 Candidate Species Credit Species Summary

This section provides a summary of the candidate species credit fauna and flora species for the Subject Land derived from BAMC (DCCEW 2023e). 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 11**; **Table 12**).

Table 11. 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?
Anthochaera phrygia Regent Honeyeater (Breeding)	No. The Subject Land is not included on the map of important areas for Regent Honeyeaters. As such, this species was excluded from the assessment.	No	NA	Very High - 3	No
Burhinus grallarius Bush Stone-curlew	No. Habitat constraints for this species requires fallen/standing dead timber. As no such habitat was identified within the Subject Land this species was included in the Site Assessment.	No	NA	High - 2	No
Callocephalon fimbriatum Gang-gang Cockatoo (Breeding)	No. This species requires hollow-bearing trees with hollows greater than 7cm diameter at least 3m above the ground. Suitable hollows were not identified within the Subject Land, therefore this species was included in the assessment.	No	NA	High – 2	No
Calyptorhynchus lathami lathmi South-eastern Glossy Black-cockatoo (Breeding)	No. This species requires hollow-bearing trees with hollows greater than 15cm diameter, higher than 8m above the ground. Suitable hollows were not identified within the Subject Land, therefore this species was included in the assessment.	No	NA	High – 2	No
Cercartetus nanus Eastern Pygmy-possum	Yes. This species occurs in a broad range of habitats from rainforest through sclerophyll (including Box-Ironbark) forest and woodland to heath. As potential habitat was identified within the Subject Land, this species was included in the assessment.	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?
Crinia tinnula Wallum Froglet	Yes. This species is known to be associated with sedgelands and wet heathlands as well as along drainage lines. As such habitat was present within the Subject Land this species was included in the assessment.	No	Assumed Present	Moderate – 1.5	**Yes**
Haliaeetus leucogaster White-bellied Sea-Eagle (Breeding)	Yes. Habitat for this species is described as associated vegetation within 1km of rivers, large lakes, large dams or creeks, wetlands and coastlines. As such habitat occurs within 1km of the Subject Land this species has been included in the assessment.	Yes	No	High - 2	No
Heleioporus australiacus Giant Burrowing Frog	No. Suitable breeding habitat for this species consists of ephemeral flowing streams that have permanent pools, or in upland swamps, and are located within native vegetation. Most typically breeding occurs in streams with a bed width of up to five metres (e.g. 2nd order and 3rd order streams) and upland swamps located on suitable geologies. Non-breeding habitat is any area of PCT on the subject land that is located within 300m of suitable breeding habitat (DPIE 2020c). As the Subject Land occurs on a claystone geology, such habitat us unlikely present therefore this species has been exlcuded in the assessment.	No	NA	Moderate – 1.5	No
Hieraaetus morphnoides Little Eagle (Breeding)	Yes. This species requires live or occasionally dead large old trees within vegetation for nesting. As potential breeding habitat was identified within the Subject Land, this species was included in the assessment.	No	Assumed Present	Moderate – 1.5	**Yes**
Hoplocephalus stephensii Stephens' Banded Snake	Yes. This species is known to occur in rainforests and eucalypt forests. Or within 500m of suitable habitat. As suitable habitat was present within 500m of the Subject Land this species has been included in the assessment.	No	Assumed Present	High - 2	**Yes**
Lathamus discolor Swift Parrot (Breeding)	No. The Subject Land is not included on the map of important areas for Swift Parrot. As such, this species was excluded from the assessment.	No	NA	Moderate – 1.5	No
Litoria aurea	Yes. This species inhabits marshes, dams and stream sides particularly those containing Bullrushes or Spikerushes. Breeding habitat includes	Yes	No	High – 2	No

Scientific Name	Included in Assessment?	Targeted Survey conducted?	Present within Subject Land?	Biodiversity Risk Weighting	Biodiversity Offset Credits Required?
Green and Golden Bell Frog	water-bodies that are unshaded, free of predatory fish, have grassy areas nearby and diurnal sheltering sites available. As such habitat was present within the Subject Land it was included in the assessment.				
Lophoictinia isura 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. Suitable live large old trees were identified within the Subject Land. Thus, this species was included in the assessment.	Yes	No	Moderate – 1.5	No
Miniopterus australis Little Bent-winged Bat (Breeding)	No. This species is known to breed in caves, tunnels, mines and culverts or other structures known or suspected to be used for breeding. No caves, tunnels, mines or culverts exist within the Subject Land. As such, this species was excluded from species credit assessment.	No	NA	Very High - 3	No
Miniopterus orianae oceanensis Large Bent-winged Bat (Breeding)	No. This species is known to breed in caves, tunnels, mines and culverts or other structures known or suspected to be used for breeding. No caves, tunnels, mines or culverts exist within the Subject Land. As such, this species was excluded from species credit assessment.	No	NA	Very High - 3	No
Mixophyes iteratus Giant Barred Frog	Yes. This species is found along freshwater streams with permanent or semi-permanent water, generally (but not always) at lower elevation. As such habitat was present adjacent to the Subject Land this species has been included in the assessment.	Yes	Assumed Present	High - 2	**Yes**
Myotis macropus Southern Myotis	Yes. This species is known to roost in tree hollows close to water. As a suitably sized dam is present within the Subject Land this species was included in the assessment.	Yes	Assumed Present	High - 2	**Yes**
Nettapus coromandelianus Cotton Pygmy-Goose	Yes. This species is known to inhabit wetland areas. As such habitat was present adjacent to the Subject Land this species was included in the assessment.	Yes	No	High - 2	No

Scientific Name	Included in Assessment?	Targeted Survey conducted?	Present within Subject Land?	Biodiversity Risk Weighting	Biodiversity Offset Credits Required?
Ninox connivens Barking Owl	No. This species is known to breed in living or dead trees with hollows greater than 20cm diameter and greater than 4m above the ground. As no suitable habitat was identified within the Subject Land, this species was excluded from the assessment.	No	NA	High - 2	No
Ninox strenua Powerful Owl	No. This species is known to breed in living or dead trees with hollows greater than 20cm diameter and greater than 4m above the ground. As no suitable habitat was identified within the Subject Land, this species was excluded from the assessment.	No	NA	High - 2	No
Pandion cristatus Eastern Osprey (Breeding)	Yes. This species is known to breed in dead or living trees in cleared and riparian areas. As such habitat was present within the Subject Land this species was included in the assessment.	Yes	No	Moderate – 1.5	No
Petauroides volans Southern Greater Glider	No. This species is typically found in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows. During the day it shelters in tree hollows, with a particular selection for large hollows, in large old trees (Threatened Species Scientific Committee 2016). As no suitable habitat was identified within the Subject Land, this species was excluded from the assessment.	No	NA	High – 2	No
Petaurus norfolcensis Squirrel Glider	No. This species is known to inhabit mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas. Optimal habitat includes stands of Acacia and shrubby understory with abundant hollows. As no suitable habitat was identified within the Subject Land, this species was included in the assessment.	No	NA	High – 2	No
Phascogale tapoatafa Brush-tailed Phascogale	Yes. This species is known to inhabit a range of vegetation communities including heath, dry sclerophyll open forest, swamps and rainforest. Optimal habitat contains rough barked trees with sparse groundcover of herbs, grasses, shrubs or leaf litter. Nesting habitat is small hollows with	Yes	Assumed Present	High – 2	**Yes**

Scientific Name	Included in Assessment?	Targeted Survey conducted?	Present within Subject Land?	Biodiversity Risk Weighting	Biodiversity Offset Credits Required?
	2.5-4cm wide entrance. Suitable habitat occurs onsite; therefore, the species was included in the assessment.				
Phascolarctos cinereus Koala	Yes. This species inhabits eucalypt woodlands and forests. As Koala use trees were identified within the Subject Land, this species was included in the assessment.	Yes	No	High – 2	No
Planigale maculata Common Planigale	No. This species is known to largely occur north from the Upper Hunter River Valley (DPE 2023c). As the Subject Land is located south of this region the species has been excluded from the assessment.	No	NA	High – 2	No
Potorous tridactylus Long-nosed Potoroo	No. Habitat constraints for this species is a dense shrub layer or canopy cover of >70%. The vegetation within the Subject Land has a cover of <50% and the shrub layer is actively managed within the school grounds. As such habitat was not present within the Subject Land this species has been excluded in the assessment.	No	NA	High – 2	No
Pteropus poliocephalus Grey-headed Flying-fox (Breeding)	No. No breeding camps have been previously recorded within proximity to the Subject land and were not identified within the Subject Land. Thus, breeding habitat for this species was excluded from the assessment.	No	NA	High – 2	No
Tyto novaehollandiae Masked Owl (Breeding)	No. This species is known to breed in living or dead trees with hollows greater than 20cm diameter and greater than 4m above the ground. As no suitable habitat was identified within the Subject Land, this species was excluded from the assessment.	No	NA	High – 2	No
Uperoleia mahonyi Mahony's Toadlet	Yes. This species is known to occur in wallum heath, Swamp Mahogany-paperbark swamp forest, heath shrubland and Sydney Red Gum woodland. The species records are almost exclusively associated with leached (highly nutrient impoverished) white sand. As the Subject Site lacks the associated soil type This species was excluded from the assessment.	No	NA	High – 2	No

Scientific Name	Included in Assessment?	Targeted Survey conducted?	Present within Subject Land?	Biodiversity Risk Weighting	Biodiversity Offset Credits Required?
Vespadelus troughtoni Eastern Cave Bat	No. Potential breeding habitat is identified as land within 100m of rocky areas containing caves, overhangs, crevices, cliffs, escarpments, old mines, tunnels, culverts, or derelict concrete buildings with potential foraging habitat being associated PCTs within 2km of these rocky areas (DPE 2023d). Based on the flat landscape surrounding the Subject Land no such habitat is believed to exist within 2km. As such this species has been excluded from the assessment.	No	NA	Very High – 3	No

Table 12. 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?
Angophora inopina Charmhaven Apple	Yes. This species occurs most frequently in four main vegetation communities: (i) *Eucalyptus haemastoma–Corymbia gummifera–Angophora inopina* woodland/forest; (ii) *Hakea teretifolia–Banksia oblongifolia* wet heath; (iii) *Eucalyptus resinifera–Melaleuca sieberi–Angophora inopina* sedge woodland; (iv) *Eucalyptus capitellata–Corymbia gummifera–Angophora inopina* woodland/forest. Whilst the associated vegetation communities don't occur within the Subject Land, this species was included in the assessment.	Yes	No	High – 2	No
Callistemon linearifolius Netted Bottle Brush	Yes. This species grows in dry sclerophyll forest on the coast and adjacent ranges. As such habitat was present within the Subject Land this species was included in the assessment.	Yes	No	Moderate – 1.5	No

Scientific Name	Included in Assessment?	Targeted Survey conducted?	Present within Subject Land?	Biodiversity Risk Weighting	Biodiversity Offset Credits Required?
Corunastylis sp. Charmhaven	Yes. This species occurs in low woodland to heathland with a shrubby understorey and ground layer. As such habitat was present within the Subject Land this species as been included in the assessment.	Yes	No	Very High – 3	No
Eucalyptus parramattensis subsp. parramattensis - endangered population *Eucalyptus parramattensis* C. Hall. *subsp. parramattensis* in Wyong and Lake Macquarie local government areas	No. This species is associated with low moist areas alongside drainage lines and adjacent to wetlands. It is often found in woodland on sandy soils. Geographical limitations for the species are Wyong and Lake Macquari LGA's. As the Subject Site is not in wither of these LGA's, this species was excluded from the assessment.	No	NA	High – 2	No
Genoplesium insigne Variable Midge Orchid	No. This species is known from limited populations between Charmhaven and Chain Valley Bay (NSW Scientific Determination 2015). As the Subject land is located outside of this distribution this species has been excluded from the assessment.	No	NA	Very High – 3	No
Melaleuca biconvexa Biconvex Paperbark	Yes. This species generally grows in damp places, often near streams or low-lying areas on alluvial soils of low slopes or sheltered aspects. As such habitat was located within the Subject Land this species has been included in the assessment.	Yes	No	High – 2	No
Rhodamnia rubescens Scrub Turpentine	Yes. Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils. As such habitat was located within the Subject Land this species has been included in the assessment.	Yes	No	Very High – 3	No

Scientific Name	Included in Assessment?	Targeted Survey conducted?	Present within Subject Land?	Biodiversity Risk Weighting	Biodiversity Offset Credits Required?
Syzygium paniculatum Magenta Lilly Pilly	No. On the central coast Magenta Lilly Pilly occurs on gravels, sands, silts and clays in riverside gallery rainforests and remnant littoral rainforest communities. No such habitat was present within the Subject Land therefore this species was excluded from the assessment.	No	NA	High – 2	No

4.3 Species Credit Habitat Surveys

Targeted surveys were undertaken for a number of species credit species considered likely to have suitable habitat within the Subject Land (**Figure 17**). These surveys were conducted in accordance with Section 5.3 of the BAM and all relevant DPE threatened species survey guidelines.

Targeted surveys were undertaken by the following experienced ecologists over the following dates:

- Luke Johnson and Kayla Spithoven: 29th April 2024; and
    - Threatened Flora searches;
    - Vegetation Survey
    - Habitat Survey;
    - Diurnal Bird Survey; and
    - Building and structure searches with hand held Echo meter.
- Luke Johnson and Philip Maxwell: 4th December 2024.
    - Threatened Flora searches;
    - Habitat Survey;
    - Diurnal Bird and Amphibian Survey; and
    - Building and structure searches with hand held Echo meter.

Weather conditions taken from the nearest weather station (Norah Head NSW, station no. 061366) in the lead up and during the field survey are outlined in **Table 13**. Rainfall and moderate temperatures were recorded leading up to each site assessment which is likely to have been conducive for identifying threatened species and their habitats should they occur within the Subject Land.

Table 13. Weather conditions taken from the nearest weather stations (Station number 061412) in the lead up and during the field survey (BOM 2023). Survey date is in bold

Timing/activities	Undertaken By (Approximate Hours Spent)	Date	Day	Temperature		Rainfall (mm)
				Min	Max	
Lead up to the survey	-	23.04.2024	Tuesday	15.9	26.0	-
		24.04.2024	Wednesday	16.6	25.7	0
		25.04.2024	Thursday	15.9	20.7	0
		26.04.2024	Friday	14.1	20.0	0
		27.04.2024	Saturday	13.8	23.2	0.2
		28.04.2024	Sunday	15.5	25.5	0.6
Site Assessment, Threatened Flora Species Survey, Vegetation Survey, Habitat Survey, Building and Structure survey	**Luke Johnson Kayla Spithoven (16 hours)**	**29.04.2024**	**Monday**	15.9	27.0	0
Lead up to the survey	-	27.11.2024	Wednesday	18.8	27.1	0.2
		28.11.2024	Thursday	20.4	25.2	0.4
		29.11.2024	Friday	19.5	20.8	1.6
		30.11.2024	Saturday	19.8	23.5	5.0
		01.12.2024	Sunday	18.8	26.2	6.4
		02.12.2024	Monday	18.1	27.6	0.6
		03.12.2024	Tuesday	19.5	28.9	0

Timing/activities	Undertaken By (Approximate Hours Spent)	Date	Day	Temperature		Rainfall (mm)
				Min	Max	
Site Assessment, Threatened Flora Species Survey, Vegetation Survey, Habitat Survey, Building and Structure survey, Diurnal bird and Amphibian Survey	Luke Johnson and Philip Maxwell (16 Hours)	04.12.2024	Wednesday	20.4	23.1	0

4.3.1 Fauna Species Credit Survey

A total of thirty-one (31) threatened fauna species were identified within the BAMC (DPE 2023e) as having the potential to occur within the Subject Land.

Following the site assessments thirteen (13) species were identified as having the potential to occur within the Subject Land due to suitable habitat. To determine whether these species credit species are present, or are likely to use suitable habitat on the Subject Land, the following was undertaken:

- Targeted fauna surveys were conducted for six (6) species within the DPE endorsed survey period (**Table 14**). The targeted survey effort undertaken for these species is detailed in Section **4.3.1.1.**
- Seven (7) species were assumed present as targeted surveys were unable to be completed within the DPE endorsed survey period or specific survey effort/requirements for the species ie. Nocturnal surveys.

The remaining eighteen (18) species were not surveyed 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 BDAR; 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 BDAR.

Table 14. 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
Cercartetus nanus Eastern Pygmy possum **(Assumed Present)**												
Crinia tinnula Wallum Froglet **(Assumed Present)**												
Haliaeetus leucogaster White-bellied Sea-Eagle												✓
Hieraaetus morphnoides Little Eagle (Breeding) **(Assumed Present)**				✓								✓
Hoplocephalus stephensii Stephen's Banded Snake **(Assumed Present)**												
Litoria aurea Green and Golden Bell Frog												✓

Candidate Fauna Species	Survey Period (BAMC)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Lophoictinia isura Square-tailed Kite (Breeding)				✓								✓
Mixophyes iteratus Giant Barred Frog **(Assumed Present)**												
Myotis macropus Southern Myotis **(Assumed Present)**												
Nettapus coromandelianus (Cotton Pygmy-goose)				✓								✓
Pandion cristatus Eastern Osprey				✓								✓
Phascogale tapoatafa Brush-tailed Phascogale **(Assumed Present)**												
Phascolarctos cinereus Koala				✓								✓
Key	✓ = Time of Site Assessment						= DPE Endorsed Survey Period					

4.3.1.1 Targeted Mammal Species Credit Survey

Targeted surveys were undertaken for the following species credit species that were identified by the BAM-C as having the potential to utilise the habitat within the Subject Land:

- *Phascolarctos cinereus* (Koala).

Targeted surveys for these species were required to determine their presence or absence. The targeted survey effort undertaken for these species is detailed in **Table 15** and displayed in **Figure 17**. None of the surveyed for BAMC predicted mammal species were identified within the Subject Land or its surrounds.

Table 15. Threatened mammal targeted survey effort within the Subject Land

Target Species	Survey Technique	Survey Effort & Timing	Target Species Identified?
Phascolarctos cinereus Koala	Diurnal Habitat Search	Two days conducting Spot Assessment Technique Surveys (SAT) searching all for scratching's and scats	No

4.3.1.2 Targeted Avian Species Credit Survey

Targeted surveys were undertaken for the following avian species credit species that were identified by the BAMC as having the potential to utilise the habitat within the Subject Land:

- *Hieraaetus leucogaster* (White-bellied Sea-Eagle);
- *Lophoictinia isura* (Square-tailed Kite);
- *Nettapus coromandelianus* (Cotton Pygmy-goose); and
- *Pandian cristatus* (Eastern Osprey).

Targeted surveys for these species were required to determine their presence or absence. The targeted survey effort undertaken for these species is detailed in **Table 16** and displayed in **Figure 17.** None of the surveyed for BAMC predicted avian species were identified within the Subject Land or its surrounds.

Table 16. Threatened avian targeted survey effort within the Subject Land.

Target Species	Survey Technique	Survey Effort & Timing	Target Species Identified?
Hieraaetus leucogaster White-bellied Sea-Eagle *Lophoictinia isura* Square-tailed Kite *Nettapus coromandelianus* Cotton Pygmy-goose *Pandian cristatus* Eastern Osprey	Diurnal Bird Surveys and Habitat Surveys (Area Search)	Diurnal bird searches, traversing the entire Subject Land during the appropriate survey timetable	No

4.3.1.3 Threatened Amphibian Targeted Survey

Targeted surveys were undertaken for the following threatened amphibian species credit species identified by the BAMC as having the potential to utilise the habitat within the Subject Land:

- *Litoria aurea* (Green and Golden Bell Frog).

Targeted surveys were conducted in accordance with the 'NSW Survey Guide for Threatened Frogs: a guide for the survey of threatened frogs and their habitats for the Biodiversity Assessment Method' (DPIE 2020c). The targeted survey effort undertaken for these species is detailed in **Table 17** and displayed in **Figure 17**. None of the surveyed for BAMC predicted amphibian species were identified within the Subject Land or its surrounds.

Table 17. Threatened amphibian targeted survey effort within the Subject Land.

Target Species	Survey Technique	Survey Effort and Timing	Targeted Species Identified?
Litoria aurea Green and Golden Bell Frog	Diurnal Habitat surveys and Call Playback	Multiple call playback points were established and undertaken over 1 day	No

4.3.1.4 Assumed Present Fauna

The following fauna species credit species were assumed present the Subject Land contained areas of suitable habitat:

- *Cercartetus nanus* (Eastern Pygmy possum): Assumed Present – Suitable Habitat;
- *Crinia tinnula* (Wallum Froglet): Assumed Present – Suitable Habitat;
- *Hieraaetus morphnoides* (Little Eagle) (Breeding): Assumed Present – Suitable Habitat;
- *Hoplocephalus stephensii* (Stephen's Banded Snake): Assumed Present – Suitable Habitat;
- *Mixophyes iteratus* (Giant Barred Frog): Assumed Present – Suitable Habitat;
- *Myotis Macropus* (Southern Myotis): Assumed Present – Suitable Habitat;
- *Phascogale tapoatafa* (Brush-tailed Phascogale): Assumed Present – Suitable Habitat; and

4.3.2 Flora Species Credit Survey

A total of eight (8) threatened flora species were identified within the BAMC (DPIE 2020a) as having the potential to occur within the Subject Land. Five (5) species were identified as having the potential to occur within the Subject Land due to suitable habitat. Targeted surveys were conducted for all five (5) species in accordance with the "Surveying Threatened Plants and Their Habitats: NSW survey guide for the Biodiversity Assessment Method" (DPIE 2020b; **Table 18**).

The excluded three (3) 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 BDAR; 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 BDAR.

Table 18. Approved survey period for credit flora species.

Candidate Fauna Species	Survey Period (BAMC)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Angophora inopina *Charmhaven Apple*				✓								✓
Callistemon linearifolius *Netted Bottle Brush*				✓								✓
Corunastylis sp. *Charmhaven*				✓								✓
Melaleuca biconvexa *Biconvex Paperbark*				✓								✓
Rhodamnia rubescens Scrub Turpentine				✓								✓
Key	✓ = Time of Site Assessment						= DPE Endorsed Survey Period					

4.4 Species Polygons

Eight (8) threatened species have been assumed present that may be impacted by the proposed development.

- *Cercartetus nanus* (Eastern Pygmy Possum): Assumed Present – Suitable Habitat;
- *Crinia tinnula* (Wallum Froglet): Assumed Present – Suitable Habitat;

- *Hieraaetus morphnoides* (Little Eagle) (Breeding): Assumed Present – Suitable Habitat;
- *Hoplocephalus stephensii* (Stephen's Banded Snake): Assumed Present – Suitable Habitat;
- *Mixophyes iteratus* (Giant Barred Frog): Assumed Present – Suitable Habitat;
- *Myotis Macropus* (Southern Myotis): Assumed Present – Suitable Habitat;
- *Phascogale tapoatafa* (Brush-tailed Phascogale): Assumed Present – Suitable Habitat; and
- *Uperoleia mahonyi* (Mahony's Toadlet): Assumed Present – Suitable Habitat.

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 fauna species assumed to be present within the Subject Land have had the following species polygons assigned to them.

Table 19. threatened Species Polygons and Requirements

Threatened Species	Species Polygon Requirements	Associated PCTs (DPE 2023d)	Vegetation Zones
Cercartetus nanus Eastern Pygmy Possum	All areas of habitat that intersect The Subject Land (Figure 12).	4021	All of zones 1 and 2
Crinia tinnula Wallum Froglet	50m buffer from the top of bank incorporating PCTs with which the species is associated. (Figure 13).	4021	All of zone 1
Hieraaetus morphnoides Little Eagle	300m from any vegetation with large old trees. (Figure 15).	4021	All of zones 1 and 2
Hoplocephalus stephensii Stephen's Banded Snake	Full extent of all suitable habitat on the Subject Land (Figure 16).	4021	All of zones 1 and 2
Mixophyes iteratus Giant Barred Frog	50m buffer from the top of bank incorporating PCTs with which the species is associated (Figure 13).	4021	All of zone 1
Myotis Macropus Southern Myotis	All native vegetation located within a 200m buffer suitable waterbodies located within and in close proximity to the Subject Land (Figure 14).	4021	All of zones 1 and 2

Threatened Species	Species Polygon Requirements	Associated PCTs (DPE 2023d)	Vegetation Zones
Phascogale tapoatafa Brush-tailed Phascogale	All areas of habitat that intersect The Subject Land (Figure 12).	4021	All of zones 1 and 2

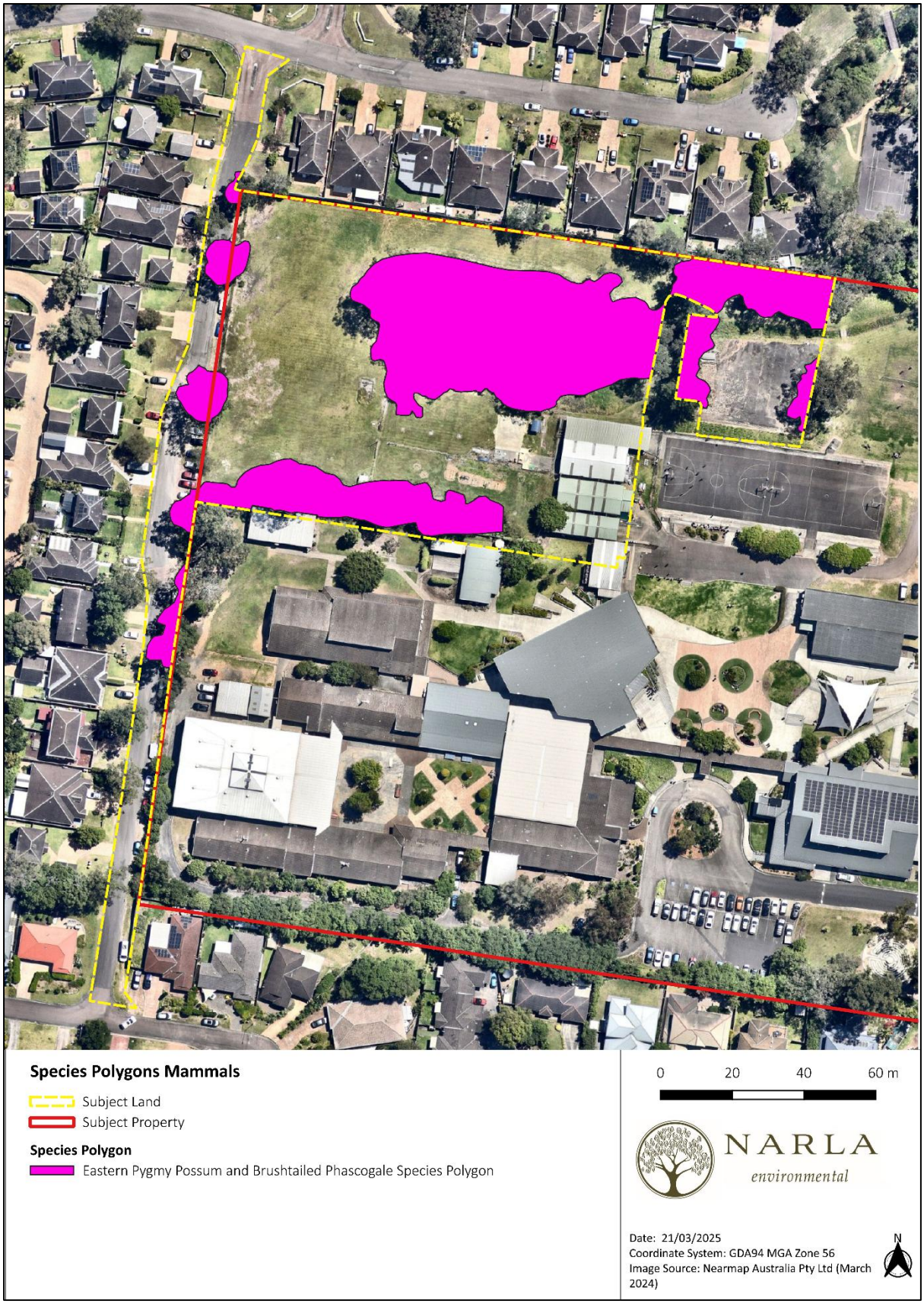

Figure 12.Threatened Mammals Species Polygon requiring offset.

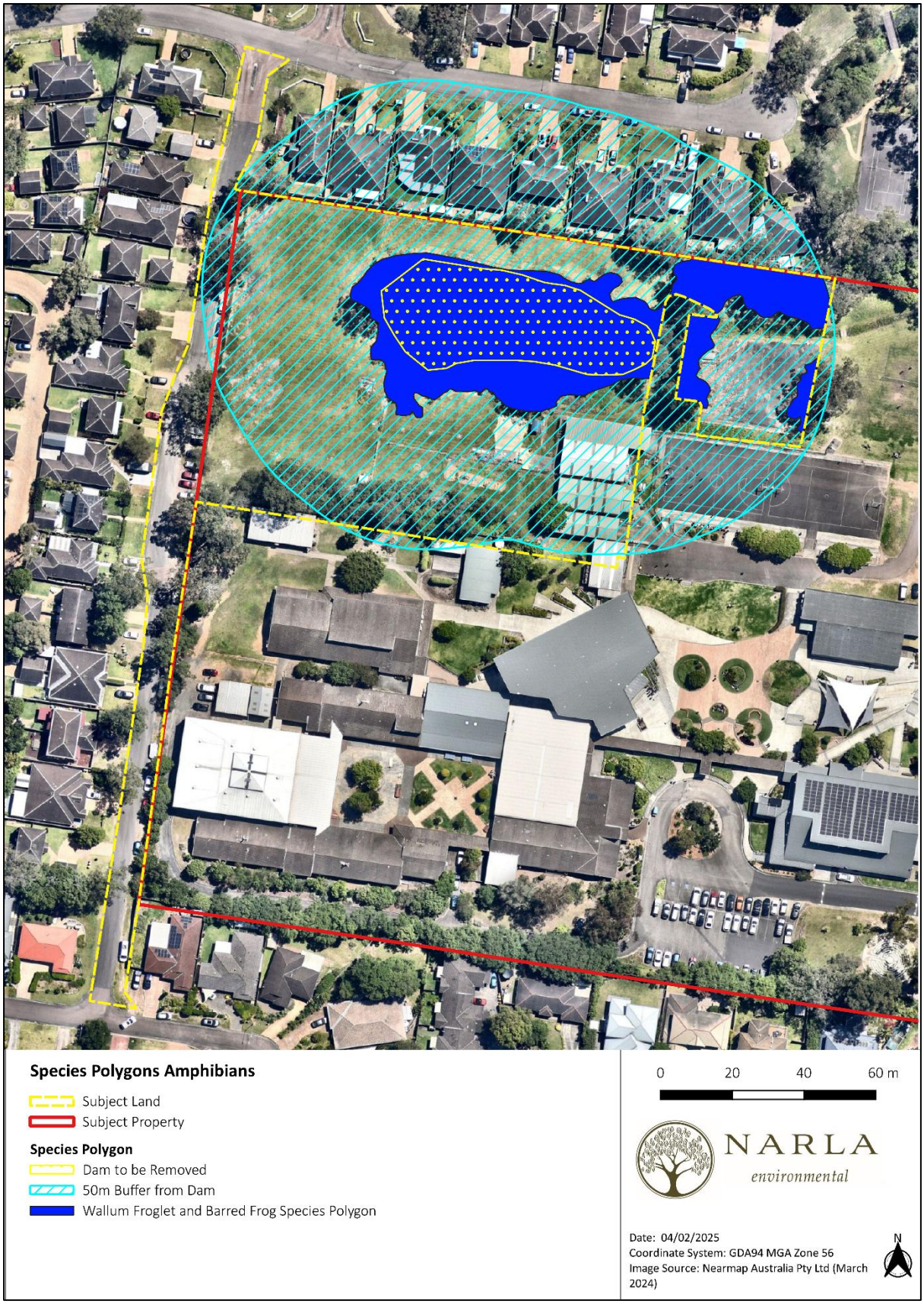

Figure 13. Threatened Amphibians Species Polygons requiring offset.

Figure 14. Southern Myotis Species Polygons requiring offset.

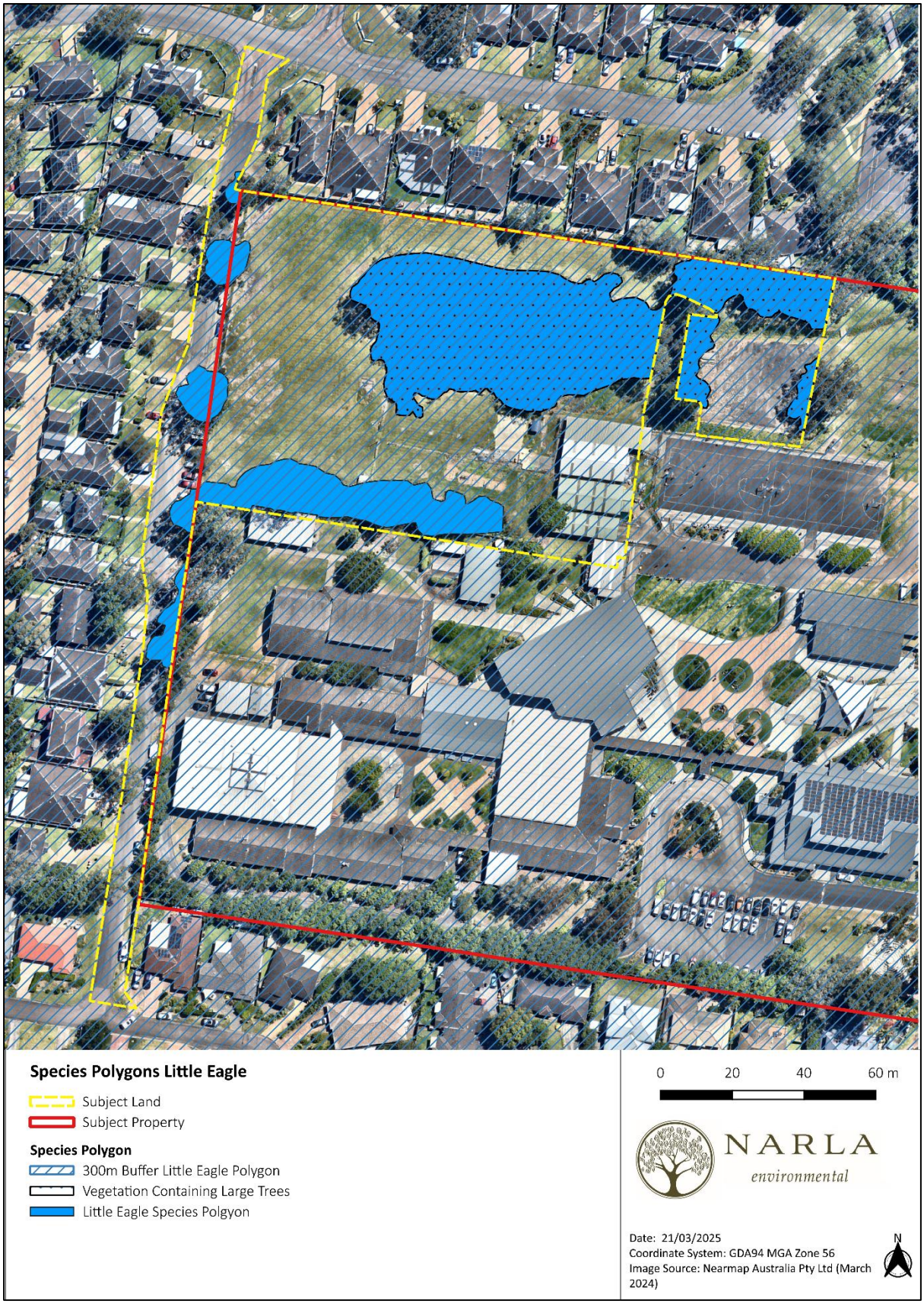

Figure 15. Little Eagle Species Polygons requiring offset.

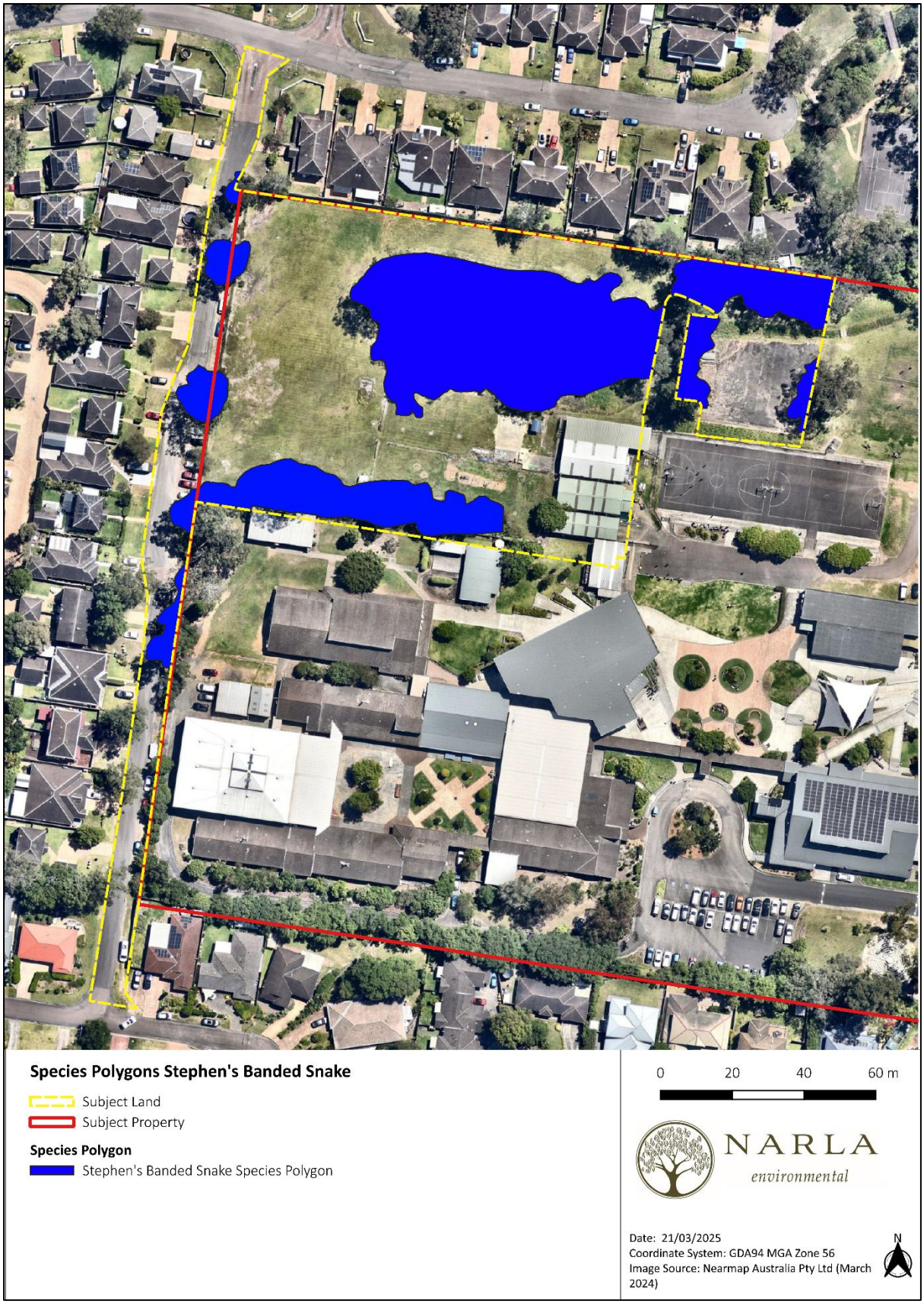

Figure 16. Stephen's Banded Snake Species Polygons requiring offset.

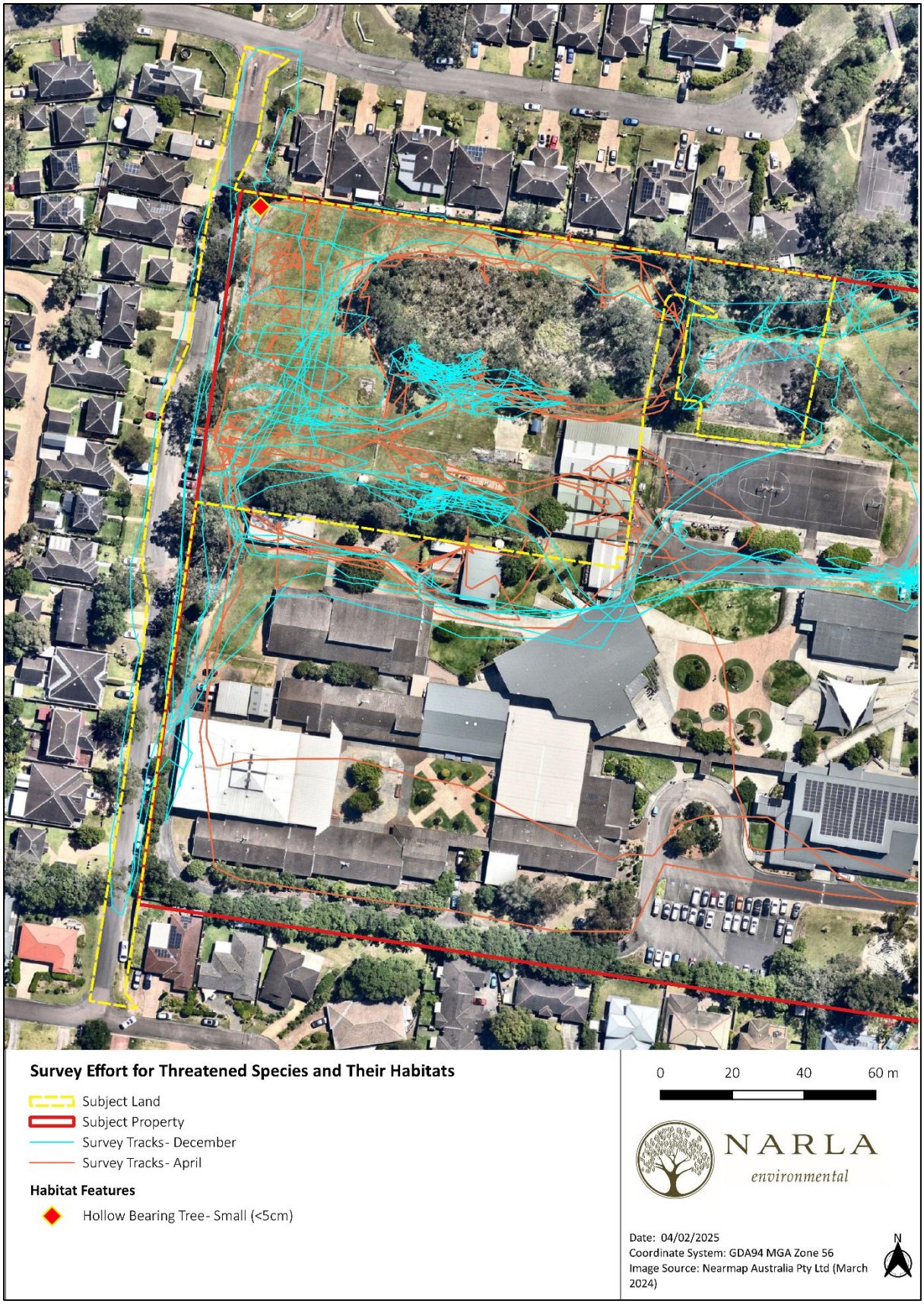

Figure 17. Survey Effort

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 development on the habitat of threatened species or ecological communities. This is discussed in Table 20.

Table 20. Prescribed and uncertain impacts associated with the proposed development.

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 contains existing buildings, that will be demolished as part of the development. Whilst a number of threatened microbat species may utilise the roof space for roosting and breeding, including: ▪ *Falsistrellus tasmaniensis* (Eastern False Pipistrelle); ▪ *Micronomus norfolkensis* (Eastern Coastal Free-tailed Bat); ▪ *Myotis macropus* (Southern Myotis); ▪ *Saccolaimus flaviventris* (Yellow-bellied Sheathtail-bat); and ▪ *Scoteanax rueppellii* (Greater Broad-nosed Bat). Targeted searches within the buildings proposed to be demolished/re-located were conducted in December and April with a hand-help Echometer. No Microbat species were identified nor are the buildings considered to provide suitable roost habitat. Non-native vegetation was present within the Subject Land; however, the removal of this vegetation is not expected to impact any threatened species.

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
On areas connecting threatened species habitat, such as movement corridors.	No	It is unlikely the proposed development will interrupt connectivity for any threatened species, as areas of habitat connectivity will continue to exist between the Subject Property and broader located through the vegetated area being retained in the eastern portion of the Subject Property.
That affect water quality, water bodies and hydrological processes that sustain threatened entities (including from subsidence or upsidence from underground mining).	No	As the existing dam and drainage channel are proposed for removal. It is unlikely that the proposed development 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.
On threatened and protected animals from turbine strikes from a wind farm.	No	No wind farms are associated with the proposed development.
On threatened species or fauna that are part of a TEC from vehicle strikes.	No	The Subject Land has the potential to support threatened species. However, due to the nature of the proposed development, it is highly unlikely that vehicle strikes will be an issue given the slow speed requirements of vehicles within the property.

6. Avoid, Minimise and Mitigate Impacts

6.1 Impact Mitigation and Minimisation Measures

This section details the measures to be implemented before, during and post construction to avoid and minimise the impacts of the project (**Table 21**).

Table 21. Mitigation and management of impacts associated with the proposed development.

Action	Outcome	Timing	Responsibility
Avoid and Minimise Impact - Project Location and Design	Owing to the vegetated nature of the Subject Land and the goals of the project to facilitate future development on the site, complete avoidance of impacts to native vegetation were not possible. The vegetation to be impacted largely consists of native remnant vegetation surrounding a dam and patch of planted native species. A significant patch of vegetation within the eastern portion of the Subject Property, will be retained which will allow habitat connectivity to continue with the vegetation on adjoining properties.	Pre-construction phase	Proponent
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 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.	Pre-construction phase	Proponent Construction Contractor

Action	Outcome	Timing	Responsibility
Assigning a Project Ecologist for Vegetation Clearing and Dam dewatering	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 any required targeted searches for threatened flora prior to vegetation clearing; ▪ Undertake an extensive pre-clearing survey, delineating habitat-bearing trees and shrubs to be retained; ▪ Undertake a microbat survey within the roof cavity of the existing buildings proposed to be removed; ▪ Supervise the dewatering of the dam 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 (2009) 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. 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.	Pre-construction phase	Proponent

Action	Outcome	Timing	Responsibility
Future Landscaping	Where appropriate future landscaping within the Subject Land is to incorporate species representative of the Coastal Creekline Dry Shrubby swamp Forest Community. As this community is generally found along riparian corridors, of which none will persist should the development be approved. Landscape species should consists or those not reliant on the presence of a riparian corridor.	Construction and post-construction phase	Proponent Project Ecologist Landscape Architect
Future Lighting	Any lighting required around the facility should point towards the development and not into surrounding vegetated areas.	Construction and post-construction phase	Proponent
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

7. Assessment of Impacts

7.1 Direct Impacts

The proposed development will result in impacts to 0.5ha of native vegetation across the following vegetation zones:

- 0.35ha of Vegetation Zone 1: PCT 4021 – Moderate condition (Remnant);
- 0.15ha of Vegetation Zone 2: PCT 4021 – Low condition (Planted);

An additional 0.64ha of vegetation will be removed from Vegetation Zone 3 consisting of landscaped and exotic vegetation.

The vegetation proposed for removal within the Subject Land is deemed of moderate quality, given the historic use of the Subject Property with the vegetation within Zones 1 and 2 conforming to the BC Act listed Swamp Sclerophyll Forest in Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions.

7.2 Prescribed Impacts

No prescribed impacts are expected as a result of the proposed development.

7.3 Indirect Impacts

Indirect impacts occur when the proposal or activities relating to the construction or operation of the proposal effect 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 this proposed development are outlined in Table 22.

Table 22. Indirect impacts associated with the proposed development.

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 proposed development. The disturbance caused during construction and operation may increase weed infestations within adjacent vegetation, which in turn may decrease its habitat value.	One (1) TEC is mapped as occurring within proximity surrounding, the Subject Land – Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions. There is also potential that threatened species occur in these 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 threatened species, threatened ecological communities and their habitats, this is not expected to impact on their bioregional persistence considering the areas of SSF adjacent to the Subject Property are at the edge of a patch and located in Environmental Conservation (C2) land. Areas of vegetation surrounding the Property have been are fenced off prior to works to minimise potential indirect impacts to the TEC and threatened species.
(b) reduced viability of adjacent habitat due to edge effects	The proposed 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.	One (1) TEC occurred adjacent to the Subject Land – Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions. There is also potential that threatened species occur in these	While edge effects may have a localised impact to TECs and threatened species, this is not expected to impact on their bioregional persistence, considering the areas of habitat connectivity within the surrounding landscape. Areas of vegetation surrounding the Subject

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.
		areas adjacent to the Subject Land. The TEC and threatened species may be impacted by edge effects leading to a reduced viability in habitat.	Land are currently affected by high levels of weed infestation and therefore it is unlikely to be significantly affected by indirect impacts to the TEC and threatened species.
(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 proposed development as well as the increased utilisation of the property. This may have an 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.	One (1) TEC occurred adjacent to the Subject Land – Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions. There is also potential that threatened species use habitat adjacent to the Subject Land. Such species may be impacted by an increase in noise and dust spill into adjacent habitats.	While the construction stage may have a localised impact to the threatened species, this is not expected to impact on their bioregional persistence, considering the areas of habitat connectivity allowing them to move away from impacted 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.
	It is expected that the construction would occur during normal working hours, however if lighting it utilised following the sheds development, light spill may decrease the habitat viability of the immediately surrounding vegetation for nocturnal species.		
(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 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.	One (1) TEC occurred adjacent to the Subject Land – Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions. There is also potential that threatened species use habitat adjacent to the Subject Land. The TEC and threatened species may be impacted by weed and pathogen transportation leading to a reduced viability in habitat.	While weeds may have a localised impact to threatened species, this is not expected to impact on their bioregional persistence considering the areas of habitat connectivity within the surrounding areas. As previously discussed the vegetation located adjacent to the Subject Property is already impacted by weed infestation. Therefore it is unlikely to be significantly increased by the proposed development. The introduction of pathogens such as myrtle rust, has the potential to detrimentally impact native vegetation. This impact will be mitigated through the retention of

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.
			exclusion fencing around vegetation to be retained.
(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 development given the habitat connectivity that still occurs connecting the Subject Property to wider areas of habitat in the locality. 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 areas of habitat connectivity adjoining the Subject Land, it is unlikely that this impact will be significant as such habitats will continue to provide food resources and shelter for fauna species.	N/A	N/A
(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 areas of habitat connectivity adjoining 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.

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.
(g) trampling of threatened flora species	No threatened flora records exist within the Subject Property. Nor were there any recorded surrounding the Subject Land. 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 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.	N/A	N/A
(i) fertiliser drift	This issue is not likely to affect the vegetation within or surrounding the Subject Land.	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 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.

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.
(k) wood collection	This issue is not likely to affect the vegetation surrounding the Subject Land during and post-construction.	N/A	N/A
(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, 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 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 already utilise the areas surrounding the Subject Land any increase as a result of the 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 deer, 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 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 already utilise the areas surrounding the Subject Land any increase as a result of the development is expected to be localised and will not have an overall impact on the bioregional persistence of the threatened species.

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.
(o) increased risk of fire	The removal of vegetation as a result of the proposed development is not expected to alter the bushfire risk of vegetation surrounding the Subject Land.	N/A	N/A
(p) disturbance to specialist breeding and foraging habitat, e.g., beach nesting for shorebirds.	No specialist breeding or foraging habitat is located within proximity to the Subject Land.	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 proposed to be impacted as a result of the proposed development:

- 0.35ha of Vegetation Zone 1: PCT 4021 – Moderate condition (Remnant); and
- 0.15ha of Vegetation Zone 3: PCT 4021 – Low condition (Planted);

An additional 0.64ha of vegetation will be removed from Vegetation Zone 3 consisting of landscaped and exotic vegetation.

The purchase and retirement of Biodiversity Offset Credits will be required for Vegetation Zones 1 and 2 within the Subject Land (**Figure 18**). The purchase and retirement of Biodiversity Offset Credits will not be required for the vegetation within Vegetation Zones 3 owing to the exotic nature of the zone.

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:

- *Cercartus nanus* (Eastern Pygmy-possum; Assumed Present);
- *Crinia tinnula* (Wallum Froglet; Assumed Present);
- *Hieraaetus morphoides* (Little Eagle; Assumed Present);
- *Hoplocephalus stephensii* (Stephens' Banded Snake; Assumed Present);
- *Mixophyes iteratus* (Giant Barred Frog; Assumed Present);
- *Myotis macropus* (Southern Myotis; Assumed Present); and
- *Phascogale tapoatafa* (Brush-tailed Phascogale; Assumed Present).

8.3 Serious and Irreversible Impacts (SAII's)

No SAII threatened species have been identified as entities at risk of a SAII in the Threatened Biodiversity Data Collection (DPE 2023d):

Figure 18. Impacts on native vegetation and Ecosystem Credits offset requirements.

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 fourteen (14) ecosystem credits are required to offset the biodiversity impacts of the proposed development (**Table 23**).

Table 23. Ecosystem credits required to offset the proposed development. Areas have been rounded up by the BAMC

Plant Community Type (PCT)	BC Act Status	Vegetation Zone	Total Area (ha)	Species Credits Required
PCT 4021: Coastal Creekline Dry Shrubby Swamp Forest	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	Zone 1 – Moderate condition (Remnant)	0.35	11
		Zone 2 – Low condition (Planted)	0.13	3
			Total Ecosystem Credits	**14**

9.2 Offset Requirement for Species Credits

A total of seventy-nine (79) species credits that have been either 'assumed present' will require offsetting through the retiring of biodiversity offset species credits under the BOS as a result of the proposed development (**Table 24**).

Table 24. Species credits required to offset the proposed development. Areas have been rounded up by the BAMC

Species	BC Act Status	Zone	Total Area (ha)	Species Credits Required
Cercartetus nanus Eastern Pygmy-possum	Vulnerable	Zone 1: PCT 4021 - Moderate condition (Remnant)	0.35	11
		Zone 2: PCT 4021 - Low condition (Planted)	0.13	3
			Subtotal	**14**
Crinia tinnula Wallum Froglet	Vulnerable	Zone 1: PCT 4021 - Moderate condition (Remnant)	0.35	8
			Subtotal	**8**
Hieraaetus morphnoides Little Eagle	Vulnerable	Zone 1: PCT 4021 - Moderate condition (Remnant)	0.35	8
		Zone 2: PCT 4021 - Low condition (Planted)	0.13	2
			Subtotal	**10**
Hoplocephalus stephensii Stephens' Banded Snake	Vulnerable	Zone 1: PCT 4021 - Moderate condition (Remnant)	0.35	11
		Zone 2: PCT 4021 - Low condition (Planted)	0.13	3
			Subtotal	**14**
Mixophyes iteratus Giant Barred Frog	Vulnerable	Zone 1: PCT 4021 - Moderate condition (Remnant)	0.35	8
			Subtotal	**8**
Myotis macropus Southern Myotis	Vulnerable	Zone 1: PCT 4021 - Moderate condition (Remnant)	0.35	11
			Subtotal	**11**
Phascogale tapoatafa Brush-tailed Phascogale	Vulnerable	Zone 1: PCT 4021 - Moderate condition (Remnant)	0.35	11
		Zone 2: PCT 4021 - Low condition (Planted)	0.13	3
			Subtotal	**14**
			Total	**79**

10. Other Relevant Legislation and Planning Policies

10.1 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 SEPP applies to LGAs that are listed in Schedule 2 'Local government areas' of the SEPP. As the Central Coast LGA is included in Schedule 2, this chapter of the SEPP applies to the Subject Property. 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 consenting authority may grant consent to a development application for consent to carry out development on the land, the consenting authority must assess whether the development is likely to have any impact on koalas or koala habitat. If the consenting authority is satisfied that the development is likely to have low or no impact on koalas or koala habitat, the authority may grant consent to the state significant development application.

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

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

b) an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas have been recorded as being present in the previous 18 years.

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 2 of the SEPP), no signs of koala's or koala occupancy (scats, scratch marks) were observed within the Subject land during targeted SAT surveys. In addition, there are no Koala records recorded within the Subject Property in the last 18 years. Furthermore, only three (3) Koala records are located within 2.5km of the site, within the last 18 years. With the closest being approximately 2km away from 2017. It was therefore determined that owing to the survey effort conducted within the Subject Land and the minimal proximal records, the Subject Land is unlikely to constitute core koala habitat, and no further assessment under the SEPP (i.e. Koala Assessment Report) should be required.

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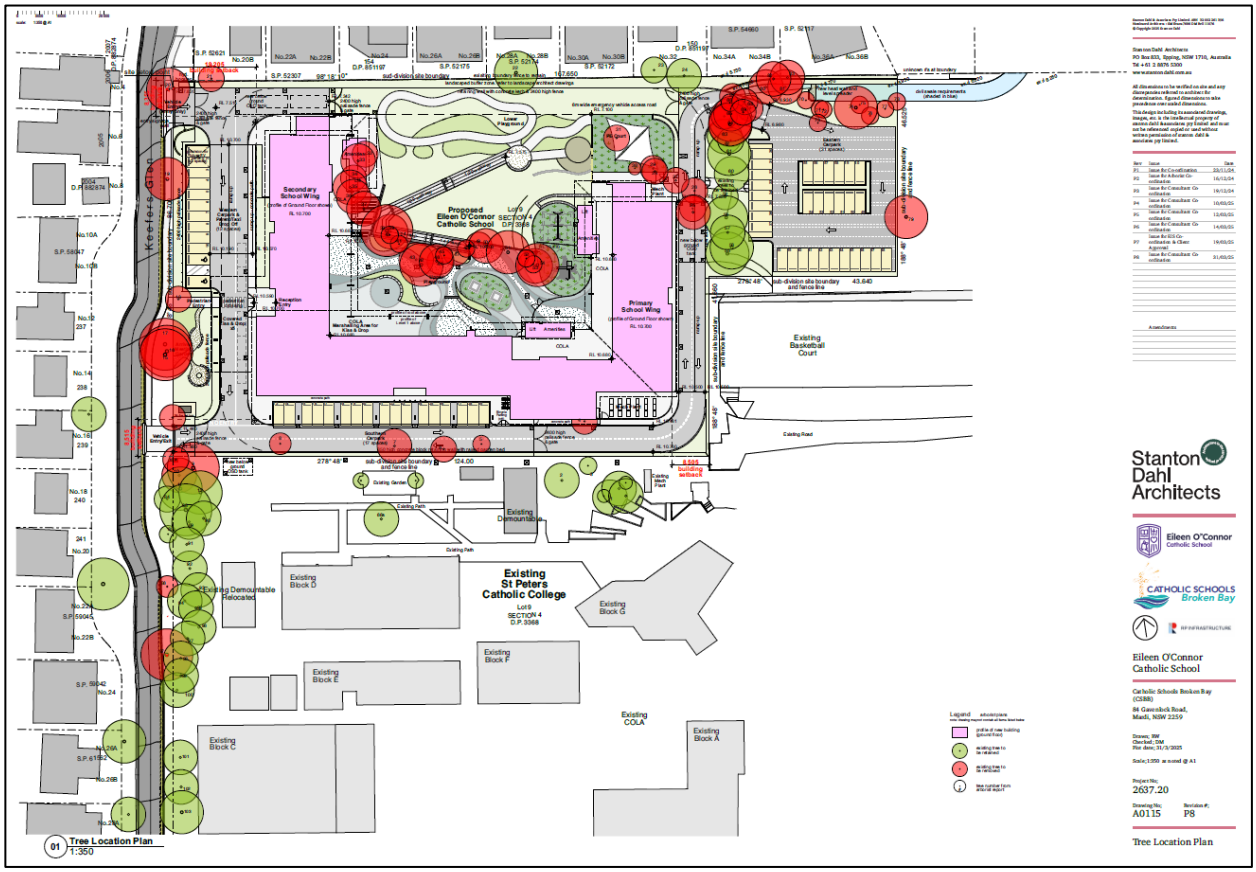
12. Appendices

Appendix A. Tree Location and Removal Plan (Stanton Dahl Architecture 2025).

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

Appendix C. BAMC Generated Biodiversity Credit Report.

Appendix A. Tree Location and Removal Plan (Stanton Dahl Architecture 2025).



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

BAM Site – Field Survey Form					
Date:	4.12.24	**Plot ID:**	1	**Photo #:**	0
Zone:	56	**Plot Dimensions:**	20 x 50	**Easting:**	351981
Datum:	GDA94	**Middle bearing from 0m:**	95	**Northing:**	6314268
PCT:	PCT 4021: Moderate Condition (Remnant)				

Growth Form	Scientific Name	Cover	Abundance
Tree (TG)	*Eucalyptus robusta*	15	12
Tree (TG)	*Angophora costata*	5	4
Shrub (SG)	*Melaleuca nodosa*	5	5
Shrub (SG)	*Acacia longifolia*	5	6
Tree (TG)	*Glochidion ferdinandi*	4	12
Tree (TG)	*Acacia binervata*	1	1
Tree (TG)	*Allocasuarina littoralis*	0.5	1
Grass & grasslike (GG)	*Gahnia clarkei*	5	20
Grass & grasslike (GG)	*Lomandra longifolia*	2	10
Forb (FG)	*Dianella caerulea*	2	30
Other (OG)	*Hibbertia scandens*	4	10
Exotic	*Lotus subbiflorus*	1	1
Grass & grasslike (GG)	*Imperata cylindrica*	7	100
Grass & grasslike (GG)	*Typha orientalis*	45	1000
Exotic	*Briza minor*	0.2	10
HTE	*Lantana camara*	5	15
HTE	*Rubus fruticosus sp. agg.*	1	5
Other (OG)	*Calochlaena dubia*	4	100
HTE	*Paspalum dilatatum*	0.1	1
Exotic	*Plantago lanceolata*	0.1	1
Exotic	*Hypochaeris glabra*	0.1	1
Exotic	*Taraxacum officinale*	0.1	1
Exotic	*Lysimachia arvensis*	0.1	1
Exotic	*Modiola caroliniana*	0.1	1
Exotic	*Conzya bonariensis*	0.1	1
Exotic	*Oxalis corniculata*	0.1	1
Exotic	*Trifolium repens*	0.1	1
Exotic	*Soliva sessilis*	0.1	1
Grass & grasslike (GG)	*Juncus spp.*	0.1	1
Forb (FG)	*Pratia purpurascens*	0.1	1
Exotic	*Sisyrinchium micranthum*	0.1	1
Grass & grasslike (GG)	*Digitaria didactyla*	0.1	1

Forb (FG)	*Commelina cyanea*	0.2	10
Forb (FG)	*Gonocarpus micranthus*	0.1	5
HTE	*Senecio madagascariensis*	0.1	10
Grass & grasslike (GG)	*Microlaena stipoides*	0.2	10

DBH	# 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

BAM Attribute (1x1m)	Litter Cover (%)
1 (5m)	10
2 (15m)	90
3 (25m)	5
4 (35m)	15
5 (45m)	0
Average	24

Growth Form	Composition Data (Count of Native Cover)	Structure Data (Sum of Cover)
Tree	5	25.5
Shrub	2	10
Grass	7	59.4
Forb	4	2.4
Fern	0	0
Other	2	8
High Threat Exotics	4	6.2

BAM Site – Field Survey Form					
Date:	4.12.2024	**Plot ID:**	2	**Photo #:**	0
Zone:	56	**Plot Dimensions:**	20 x 50	**Easting:**	351977
Datum:	GDA94	**Middle bearing from 0m:**	270	**Northing:**	6314223
PCT:	PCT 4021: Low Condition (Planted)				

Growth Form	Scientific Name	Cover	Abundance
Tree (TG)	*Eucalyptus robusta*	15	12
Tree (TG)	*Angophora costata*	5	4
Shrub (SG)	*Melaleuca nodosa*	5	5
Tree (TG)	*Casuarina glauca*	10	8
Shrub (SG)	*Acacia floribunda*	60	100
Other (OG)	*Hibbertia scandens*	2	20
HTE	*Lantana camara*	3	5
Grass & grasslike (GG)	*Microlaena stipoides*	25	200
Forb (FG)	*Commelina cyanea*	2	50
Forb (FG)	*Solanum americanum*	1	20
HTE	*Cenchrus clandestinus*	5	50
Grass & grasslike (GG)	*Gahnia spp.*	2	5
Exotic	*Verbena bonariensis*	0.1	10
Exotic	*Sida rhombifolia*	0.1	10
HTE	*Paspalum urvillei*	0.1	1
Exotic	*Modiola caroliniana*	0.1	1
Exotic	*Trifolium repens*	0.1	5
HTE	*Asparagus aethiopicus*	0.1	10
Exotic	*Conzya bonariensis*	0.2	20
Forb (FG)	*Pratia concolor*	0.1	10
Fern (EG)	*Hypolepis muelleri*	10	100
Forb (FG)	*Centella asiatica*	0.1	15
Exotic	*Stellaria media*	0.1	15

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

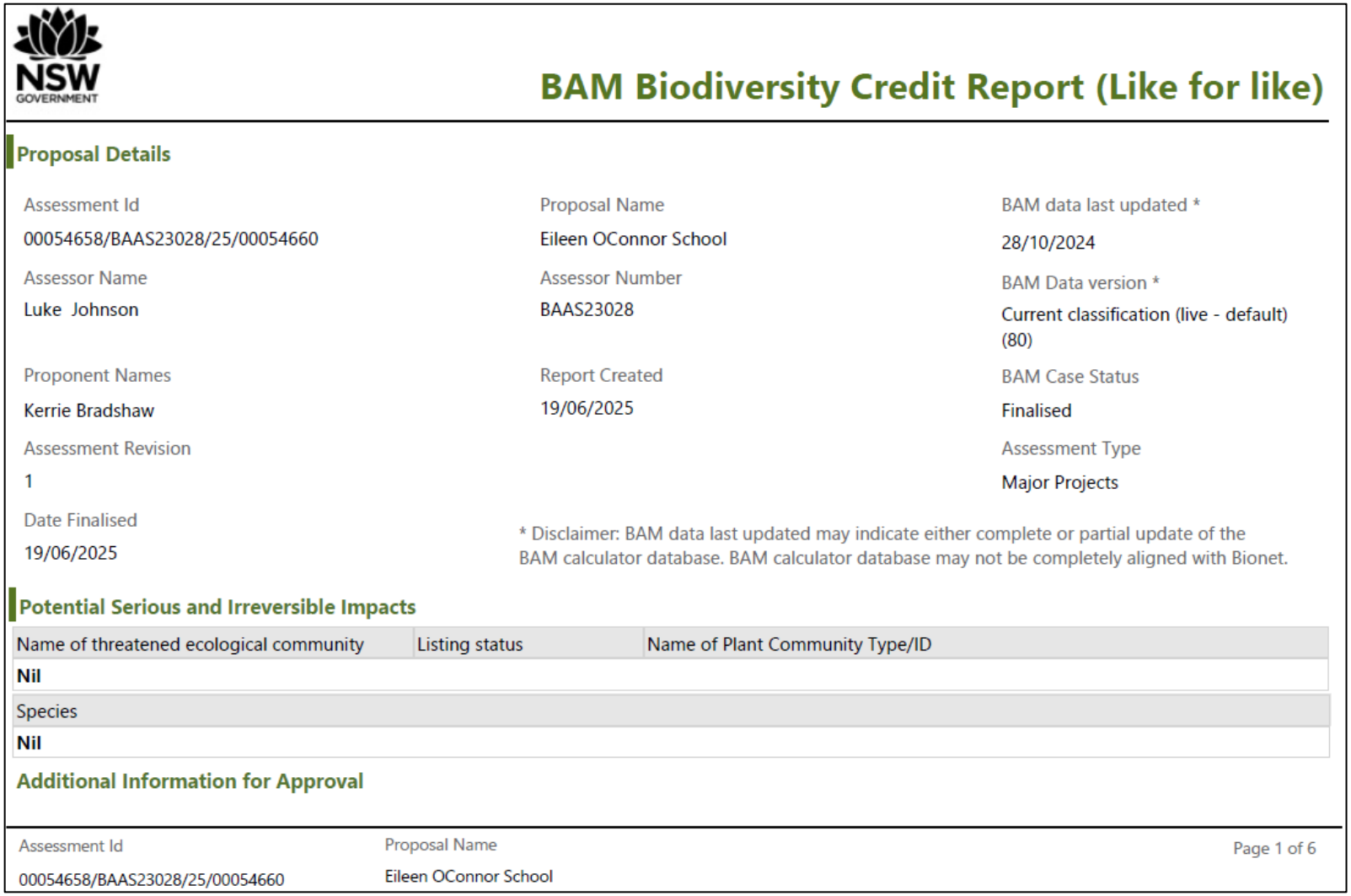
Length of Logs (m)	0

BAM Attribute (1x1m)	Litter Cover (%)
1 (5m)	80

2 (15m)	70
3 (25m)	75
4 (35m)	80
5 (45m)	80
Average	77

Growth Form	Composition Data (Count of Native Cover)	Structure Data (Sum of Cover)
Tree	3	30
Shrub	2	65
Grass	2	27
Forb	4	3.2
Fern	1	10
Other	1	2
High Threat Exotics	4	8.2

Appendix C. BAMC Generated Biodiversity Credit Report.



NSW GOVERNMENT

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id 00054658/BAAS23028/25/00054660	Proposal Name Eileen OConnor School	BAM data last updated * 28/10/2024
Assessor Name Luke Johnson	Assessor Number BAAS23028	BAM Data version * Current classification (live - default) (80)
Proponent Names Kerrie Bradshaw	Report Created 19/06/2025	BAM Case Status Finalised
Assessment Revision 1		Assessment Type Major Projects
Date Finalised 19/06/2025	* 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.	

Potential Serious and Irreversible Impacts

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

Species
Nil

Additional Information for Approval

BAM Biodiversity Credit Report (Like for like)

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
No Changes

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

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
4021-Coastal Creekline Dry Shrubby Swamp Forest	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	0.5	0	14	14

4021-Coastal Creekline Dry Shrubby Swamp Forest

Like-for-like credit retirement options

Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region

	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions This includes PCT's: 3272, 3906, 3983, 3985, 3986, 3988, 3989, 3990, 3995, 3997, 3998, 4000, 4001, 4004, 4006, 4009, 4013, 4019, 4020, 4021, 4044, 4047, 4057	-	4021_Low	No	3	Wyong, Hunter, Pittwater and Yengo. 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
Cercartetus nanus / Eastern Pygmy-possum	**4021_Moderate, 4021_Low**	0.5	14.00
Crinia tinnula / Wallum Froglet	**4021_Moderate**	0.4	8.00
Hieraaetus morphnoides / Little Eagle	**4021_Moderate, 4021_Low**	0.5	10.00
Hoplocephalus stephensii / Stephens' Banded Snake	**4021_Moderate, 4021_Low**	0.5	14.00

BAM Biodiversity Credit Report (Like for like)

Mixophyes iteratus / Giant Barred Frog	**4021_Moderate**	0.4	8.00
Myotis macropus / Southern Myotis	**4021_Moderate**	0.4	11.00
Phascogale tapoatafa / Brush-tailed Phascogale	**4021_Moderate, 4021_Low**	0.5	14.00

Credit Retirement Options

Like-for-like credit retirement options

Cercartetus nanus / Eastern Pygmy-possum	Spp	IBRA subregion
	Cercartetus nanus / Eastern Pygmy-possum	Any in NSW
Crinia tinnula / Wallum Froglet	Spp	IBRA subregion
	Crinia tinnula / Wallum Froglet	Any in NSW
Hieraaetus morphnoides / Little Eagle	Spp	IBRA subregion
	Hieraaetus morphnoides / Little Eagle	Any in NSW
Hoplocephalus stephensii / Stephens' Banded Snake	Spp	IBRA subregion
	Hoplocephalus stephensii / Stephens' Banded Snake	Any in NSW
Mixophyes iteratus / Giant Barred Frog	Spp	IBRA subregion
	Mixophyes iteratus / Giant Barred Frog	Any in NSW

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BAM Biodiversity Credit Report (Like for like)

Myotis macropus / Southern Myotis	Spp	IBRA subregion
	Myotis macropus / Southern Myotis	Any in NSW
Phascogale tapoatafa / Brush-tailed Phascogale	Spp	IBRA subregion
	Phascogale tapoatafa / Brush-tailed Phascogale	Any in NSW

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