Streamlined Biodiversity Development Assessment Report

139 - 141 Riverview Road, Avalon Beach NSW 2107

Report prepared by Narla Environmental Pty Ltd

For CM Studio

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NARLA
environmental

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Report Certification

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Document Control

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Declarations

As the accredited assessor, I Chris Moore, 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 NSW Department of Climate Change, Energy the Environment and Water to apply the Biodiversity Assessment Method.
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	Department of Climate Change, Energy the Environment and Water
DPE	Department of Planning and Environment (now NDCCEEW)
DPIE	NSW Department of Planning, Industry and Environment (now NDCCEEW)
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).
EEC	Endangered Ecological Community
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
ha	Hectares
HTE	High Threat Exotic
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	Means 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.
NDCCEEW	NSW Department of Climate Change, Energy the Environment and Water
OEH	Office of Environment and Heritage (now NDCCEEW)
OEH	Office of Environment and Heritage (now DPIE)
PCT	NSW Plant Community Type
Proposal	The development, activity or action proposed
PWSGF	Pittwater and Wagstaffe Spotted Gum Forest in the Sydney Basin Bioregion
SAII	Serious and Irreversible Impacts
SAII entity	Species and ecological communities that are likely to be the subject of serious and irreversible impacts (SAIIs)
SEARs	Secretary's Environmental Assessment Requirements

Acronym/ Term	Definition
SEPP	State Environmental Planning Policy
Species credit	The class of biodiversity credit that relate to threatened species that cannot be reliably predicted to use an area of land based on habitat surrogates. Species that require species credits are listed in the Threatened Biodiversity Data Collection.
Subject Land	The footprint of the proposed development
Subject Property	139-141 and 145 Riverview Road, Avalon Beach NSW 2107 (Lot 1/-/DP833902; Lot 2/-/DP8339020 and shared driveway access through 145 Riverview Road Avalon Beach (Lot 12/-/1303339;)
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

Executive Summary

Narla Environmental Pty Ltd (Narla) was engaged by CM Studio ('the proponent') to prepare a Streamlined Biodiversity Development Assessment Report (SBDAR) to accompany a Development Application (DA) for the proposed development at 139-141 Riverview Road, Avalon Beach NSW 2107 (Lot 1/-/DP833902 and Lot 2/-/DP833902) and the reconstruction of a shared driveway access for 139-141 and 143-145 Riverview Road (Lot 12/-/1303339) (the Subject Property). The BDAR will assess 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 as a streamlined assessment in accordance with Appendix L of the Biodiversity Assessment Method (BAM; DPIE 2020a).

The proposed development will involve the construction of a new multistorey dwelling, pool, entry Portico and a new shared access driveway for 139-141 and 143-145 Riverview Road. All areas associated with the proposed development are hereafter referred to as the 'Subject Land'. The proposed development where possible has utilised the footprint of the existing dwelling to minimise impacts to biodiversity values as much as possible. Due to the vegetated nature of the property, there are limited alternate locations for the proposed development.

The proposed development is expected to impact one (1) Plant Community Type (PCT): 3234 - Hunter Coast Lowland Spotted Gum Moist 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:

- Two (2) ecosystem credit for PCT 3234.

Owing to suitable habitat identified within proximity to the Subject Land, two (2) species credit species have been assumed present. Therefore, the following species credits are required to be offset for the proposed development:

- Three (3) species credit for *Chalinolobus dwyeri* (Large-eared Pied Bat); and
- Three (3) species credit for *Vespadelus troughtoni* (Eastern Cave Bat).

Pittwater and Wagstaffe Spotted Gum Forest, Large-eared Pied Bats and Easter Cave Bat are listed as 'SAII entities' within the BioNet Threatened Biodiversity Data Collection (DPE 2024d). Due to the potential sensitivity of this ecological community and threatened species to any impact, a determination of whether or not the proposed impacts are serious and irreversible has been undertaken in accordance with Section 9.1 of the BAM (DPIE 2020a): 'Additional impact assessment provisions for ecological communities'.

In order to avoid and minimise potential impacts of the proposal 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 in relation to the proposed development.

1. Introduction

1.1 Overview

Narla was commissioned by CM Studio on behalf of MMIG Developments Pty Ltd ('the proponent') to prepare this Streamlined Biodiversity Development Assessment Report (SBDAR) to accompany a Development Application (DA) for the proposed development at 139-141 Riverview Road, Avalon Beach NSW 2107 (Lot 1/-/DP833902 and Lot 2/-/DP833902) and the reconstruction of a shared access driveway access for 139-141 and 143-145 (Lot 12/-/1303339) hereafter referred to as the Subject Property (**Figure 1**). This SBDAR is required as the proposed works will impact upon land that is mapped as having Biodiversity Values on the Biodiversity Values Map (NDCCEEW 2024a; **Figure 2**). This BDAR will assess the biodiversity impacts of the proposed development in accordance with the requirements of the Biodiversity Conservation Act 2016, 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 L of the BAM (DPIE 2020a).

1.2 Assessment Method Applied

This SBDAR will be prepared as a site-based 'Streamlined assessment module – small area development that requires consent' as the proposed works do not exceed the clearing threshold for small area developments as outlined in the BAM (DPIE 2020a; **Table 1**).

Table 1. Area limits for application of small area development threshold. Bold indicates the threshold relevant to this report.

Minimum lot size associated with the property	Maximum area limit for application of the small area development module
Less than 1ha	**≤1ha**
Less than 40ha but not less than 1ha	≤2ha
Less than 1000ha but not less than 40ha	≤5ha
1000ha or more	≤10ha

1.3 The Proposed Development

The proposed development will involve the construction of a new multistorey dwelling, pool, entry Portico (**Appendix A**) and a new shared access driveway access for 139-141 and 143-145 Riverview Road. As per the arborist report (Martin Peacock Tree Care 2025) and Site Plan (CM Studio 2025a), forty-two (42) individual trees are recommended for removal, of which eighteen (18) are locally native species. All areas associated within the proposed development, including any works already undertaken in relation to the importation of unauthorised fill, will hereafter be referred to collectively as the 'Subject Land' (**Figure 1**).

The Subject Land covers an area of approximately 0.18ha of modified remnant bushland and planted garden species including both native and exotic species.

Northern Beaches Council granted development consent for the construction of a multistorey dwelling and access pathway at the site frontage to 145 Riverview Road (DA2022/1030; **Figure 1**). As such, this area was excluded from the BDAR.

1.4 Site Location and Description

The Subject Properties are situated within a residential landscape in the suburb of Avalon Beach in the Northern Beaches Local Government Area (LGA; **Figure 3**). It is also located within the boundaries of the Metropolitan Local Aboriginal Land Council (Metropolitan LALC; Aboriginal Land Council 2024). It has an area of 0.33ha, has frontage to Riverview Road to the east, Pittwater to the west and is bound by residential properties to the north and south. The Subject Properties are comprised of remnant bushland, exotic vegetation, an existing dwelling and an existing shared access way/driveway.

1.5 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 Northern Beaches LGA, including:

- Relevant State and Commonwealth Databases & Datasets:
    - NSW BioNet. The website of the Atlas of NSW Wildlife (NDCCEEW 2024c);
    - NSW BioNet. Threatened Biodiversity Data Collection (NDCCEEW 2024d);
    - NSW BioNet. Vegetation Classification System (NDCCEEW 2024e); and
    - Six Maps Clip & Ship (NSW Government Spatial Services 2024).
- Vegetation and Soil Mapping:
    - NSW ESpade v2.2 (NDCCEEW 2024b);
    - NSW State Vegetation Type Map (DPE 2022); and
    - Soil Landscapes of the Sydney 1:100,000 Sheet (Chapman et al. 2009).
- NSW State Guidelines:
    - Biodiversity Assessment Method (DPIE 2020b);
    - 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 2023f);
    - Biodiversity Offsets and Agreement Management System (BOAMS);
    - Surveying threatened plants and their habitats - NSW survey guide for the Biodiversity Assessment Method (DPIE 2020b); and
    - Threatened Species Survey and Assessment: Guidelines for developments and activities. Working Draft (DEC 2004).
- Council Documents:
    - Pittwater Development Control Plan (DCP) 2003; and
    - Pittwater Local Environment Plan (LEP) 2014.

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

- Arboricultural Impact Assessment Report (Martin Peacock Tree Care 2025);
- Boundary Identification and Detail Plan (Hill and Blume Consulting Services 2023);
- SBDAR 141 Riverview Road, Avalon Beach NSW 2107 (Narla 2021); and
- Site Plan - Architectural Plans - DA000 - DA900 (CM Studio 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 (NDCCEEW 2024c) 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.

1.6 Aim and Approach

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

- Describe the biodiversity values present within the Subject Land, including the extent of native vegetation, vegetation integrity and the presence of Threatened Ecological Communities (TECs);
- Determine the habitat suitability within the Subject Land for candidate threatened species;
- Prepare an impact assessment in regard to potential impacts of the 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.

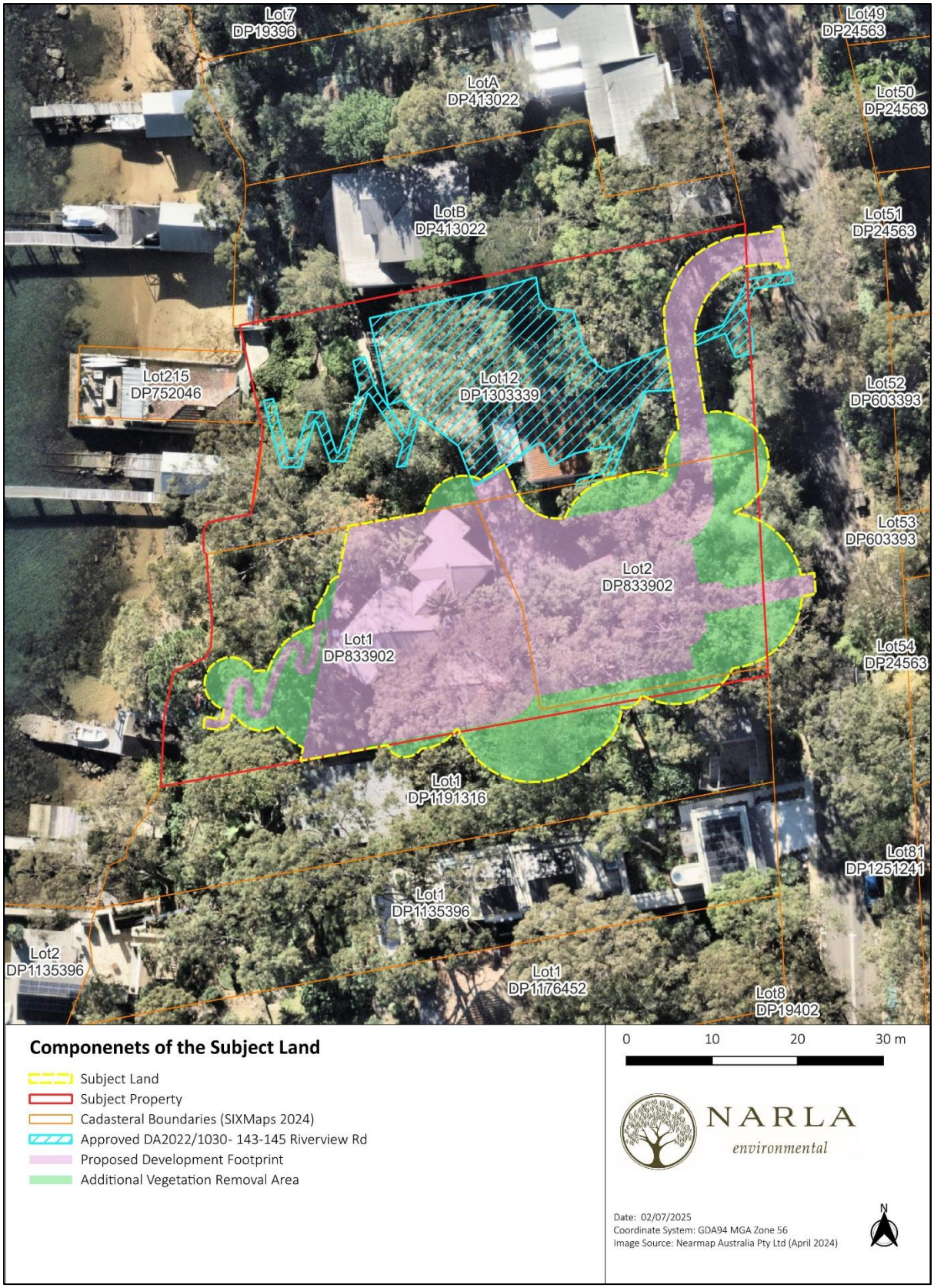

Figure 1. The components of the Subject Land.

Figure 2. Location of the Subject Land in relation to the NDCCEEW mapped Biodiversity Values land.

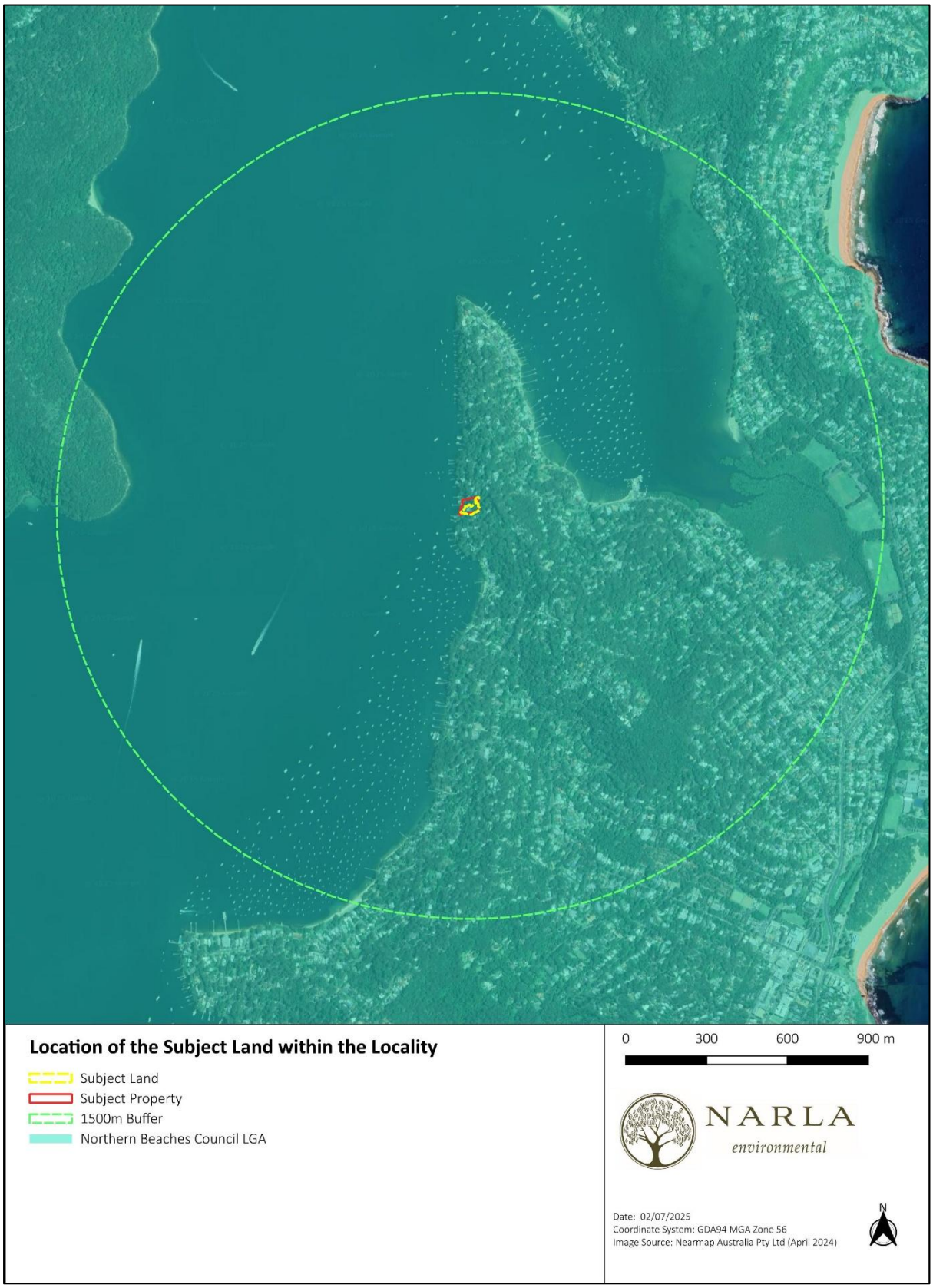

Figure 3. The location of the Subject Land within the locality.

2. Landscape

2.1 IBRA Bioregion and Subregion

The Subject Land occurs within the 'Pittwater' Interim Biogeographic Regionalisation for Australia 7 (IBRA7) Subregion, which is part of the 'Sydney Basin' IBRA7 Bioregion (**Figure 4**).

2.2 Mitchell Landscapes

Mitchell Landscapes (Mitchell 2002) group 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 was only partially mapped as containing the 'Belrose Coastal Slopes' Mitchell Landscape Ecosystem (**Figure 5**). It has been assumed that the Belrose Coastal Slopes Mitchell Landscape covers the entire Subject Land. This landscape is characterised by benched hill slopes and deep valleys of the coastal fall on horizontal Triassic quartz sandstone, lithic sandstone and shales. The landscape includes a high proportion of rock outcrop with discontinuous cliffs to 5m high. Shallow uniform or gradational sands and earthy sands occur on ridges, deeper sands, loamy sands and organic sands occur on wet benches and in hanging swamps, grey or yellow texture-contrast soils occur on shale benches.

General elevation ranges between 0 and 180m, with a local relief of 80m. In deeper soils on ridges, low woodlands consist of Scribbly Gum (*Eucalyptus haemastoma*), Red Bloodwood (*Corymbia gummifera*), Yellow-top Ash (*Eucalyptus luehmanniana*), and Narrow-leaved Apple (*Angophora bakeri*). Scrub and heath of Scrub She-oak (*Allocasuarina distyla*) and Heath Banksia (*Banksia ericifolia*), with other *Hakea*, *Grevillea*, and *Baeckea* sp., occur on ridges and upper benches. In hanging valleys, wet heath and swamps consist of *Gahnia* sp. and Swamp Banksia (*Banksia robur*). Coastal forest occurs in sheltered areas on better quality shale soil consisting of Sydney Blue Gum (*Eucalyptus saligna*), Blackbutt (*Eucalyptus pilularis*), Turpentine (*Syncarpia glomulifera*), Grey Ironbark (*Eucalyptus paniculata*), Spotted Gum (*Corymbia maculata*), Southern Mahogany (*Eucalyptus botryoides*), Cabbage-tree Palm (*Livistona australis*) and Burrawang (*Macrozamia* sp.). Coastal headlands include scrub of *Allocasuarina distyla*, Coast Rosemary (*Westringia fruticosa*), and Dwarf Kangaroo Grass (*Themeda triandra*).

2.3 Topography, Geology and Soils

The Subject Property is situated on steep terrain with elevation recorded at approximately 9-41m above sea level (asl) (Google Earth 2024). The Subject Land is mapped as occurring on the Watagan soil landscape, which is underlain by Narrabeen Group of sediments. Mostly interbedded laminite and shale with quartz to lithic quartz sandstone. Clay pellet sandstone occurs south of the Hawkesbury River (Chapman et al. 2009).

The Subject Land did not contain any areas of geological significance, such as karsts, caves, cliffs or crevices. The Subject Land was mapped as occurring on Class 5 and a minor amount on Class 1 Acid Sulfate Soils. The surrounding locality (1,500m buffer) contained large areas mapped as having Classes 1, 2 3, 4 and 5 Acid Sulfate Soils (**Figure 6**).

2.4 Hydrology

No mapped watercourses were located within the Subject Land or Subject Property; however, the riparian buffer zone from a 4th order stream to the west intersects with the Subject Property (**Figure 7**). A number of mapped watercourses and associated riparian buffer zones also occur within the 1,500m buffer surrounding the Subject Land, including 1st, 2nd and 4th order streams (**Figure 8**).

2.4.1 Coastal Environment Area and Coastal Use Area

The Subject Land occurs on areas identified as 'Coastal Environment Area' and 'Coastal Use Area' as per the State Environmental Planning Policy (Resilience and Hazards) 2021. Additionally, areas of 'Coastal Wetland', 'Littoral Rainforest' and proximity to both are mapped within the 1,500m buffer area to the east and south of the Subject Land (**Figure 9**).

2.5 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.

All areas within the 1500m buffer were not ground-truthed to determine whether native vegetation was present, therefore, native vegetation was mapped on the following assumptions:

- Turfed areas within sport ovals were determined to be non-native;
- Owing to the heavily urbanised landscape, street trees were considered non-native; and
- Tree'd areas connected to native vegetation within the Subject Land were considered to be native.

Native vegetation covered approximately 153.79ha within the buffer circle (total area = 738.88ha). However, the terrestrial areas (1,500m buffer excluding large bodies of water) within the buffer circle totalled 283.7ha and therefore, native vegetation cover was calculated to be 20.81% and assigned to the >10–30% class (**Figure 10**).

Patchy areas of habitat connectivity that may facilitate the movement of threatened species were evident within the 1,500m surrounding the Subject Land (**Figure 10**).

2.6 Areas of Outstanding Biodiversity Value

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

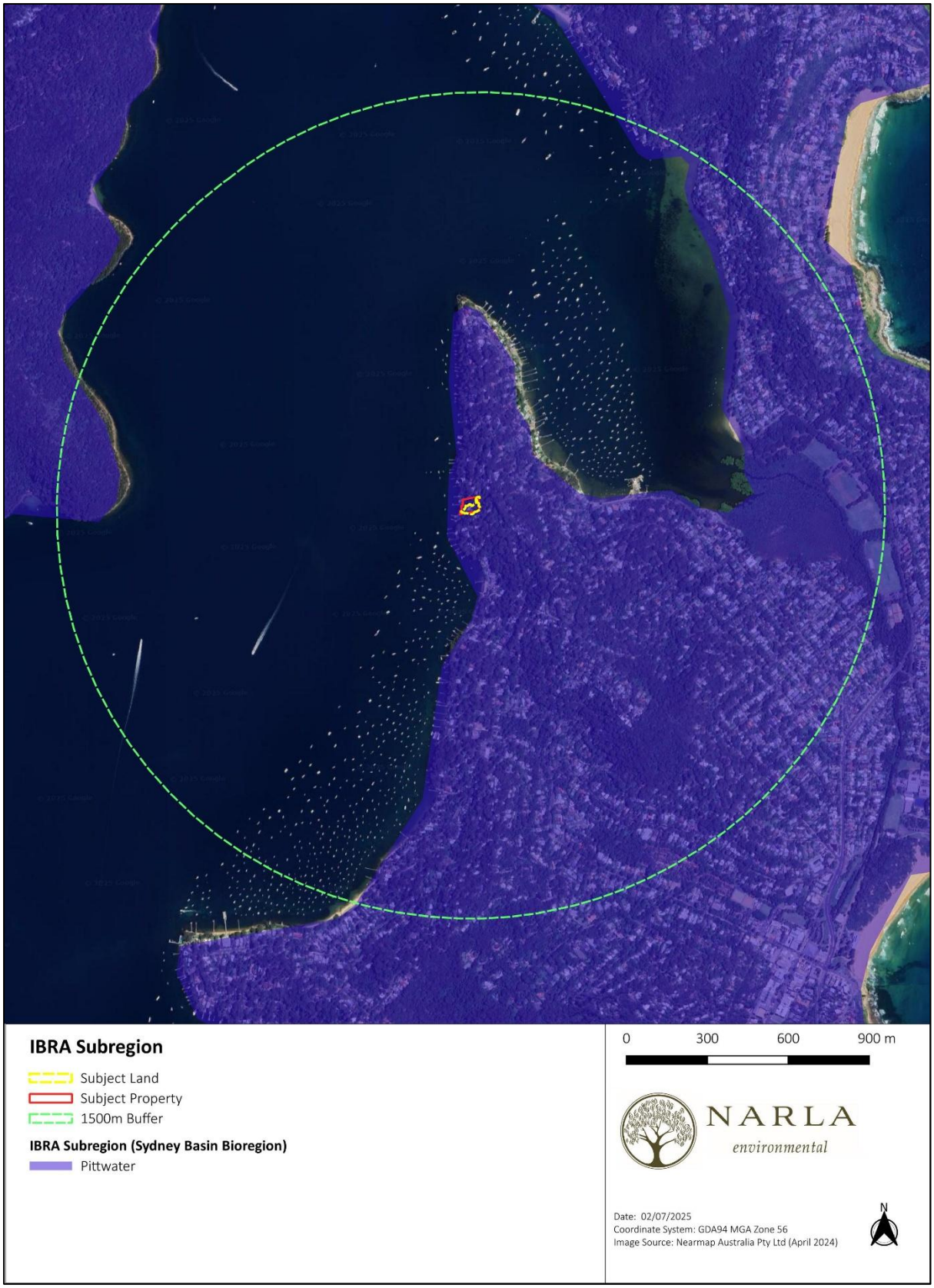

Figure 4. IBRA Bioregion and Subregion of the Subject Property, Subject Land and within a 1,500m buffer.

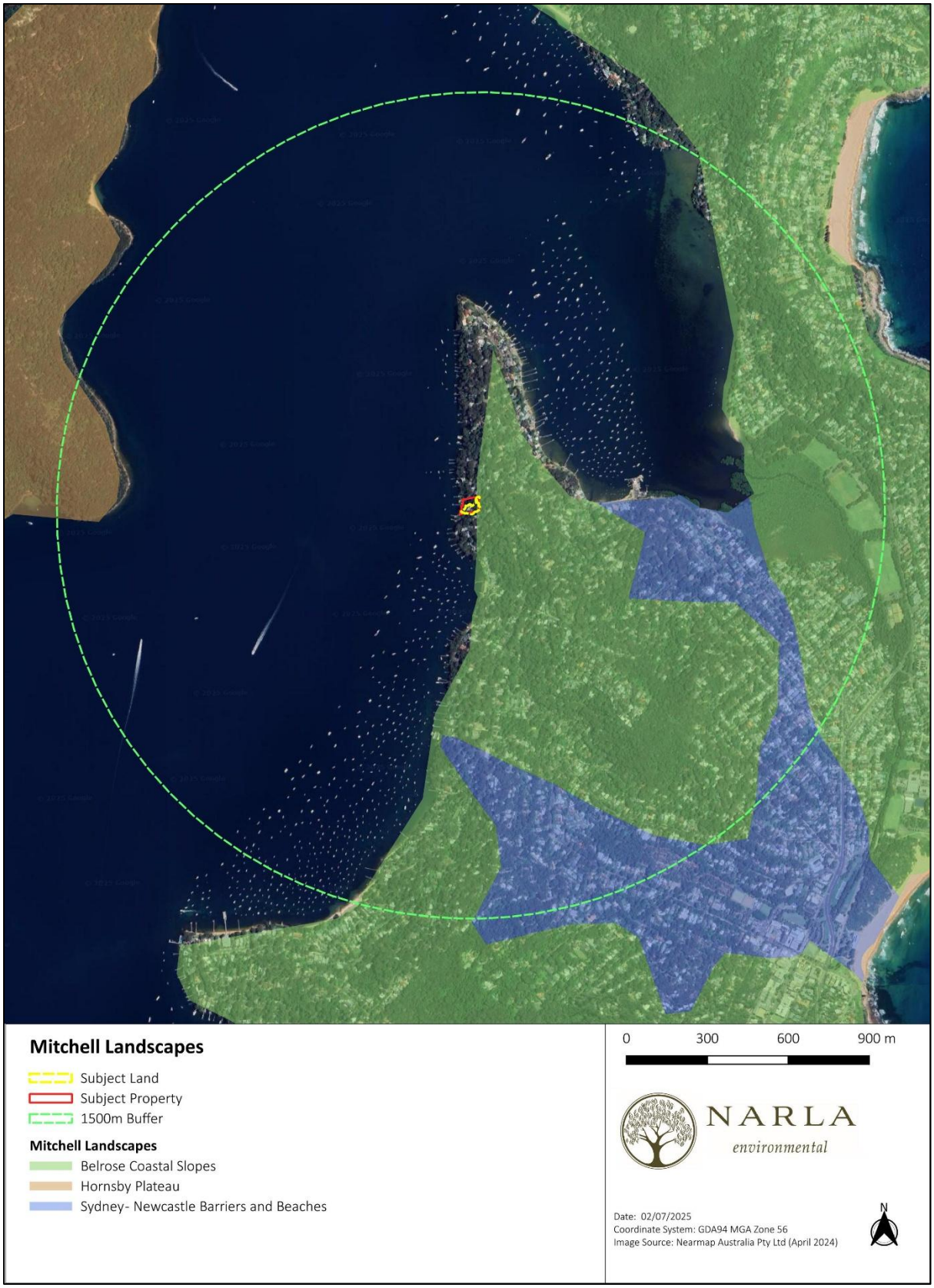

Figure 5. Mitchell Landscapes of the Subject Property, Subject Land and within a 1,500m buffer.

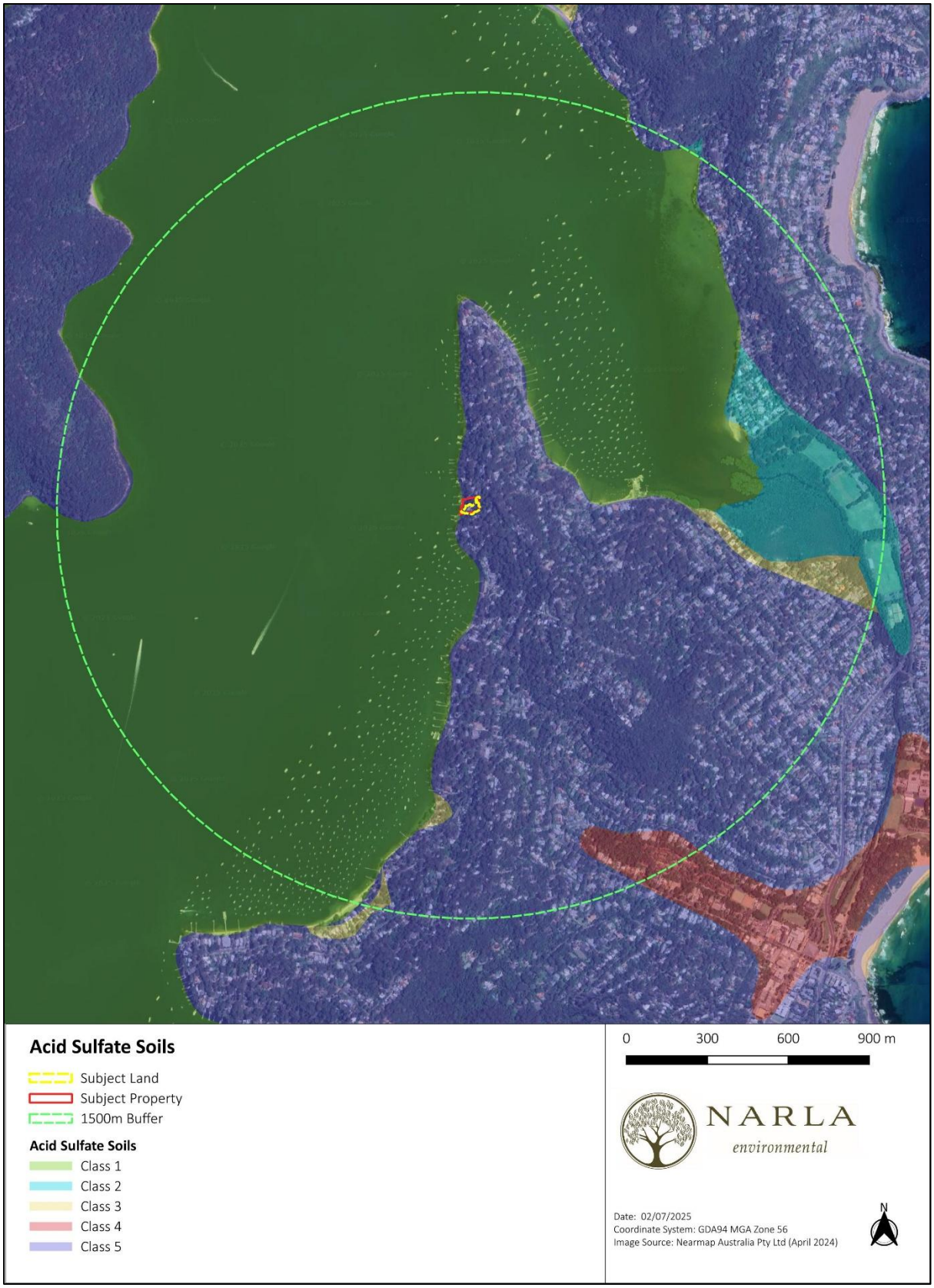

Figure 6. Acid Sulfate Soils within the Subject Property, Subject Land and within a 1,500m buffer.

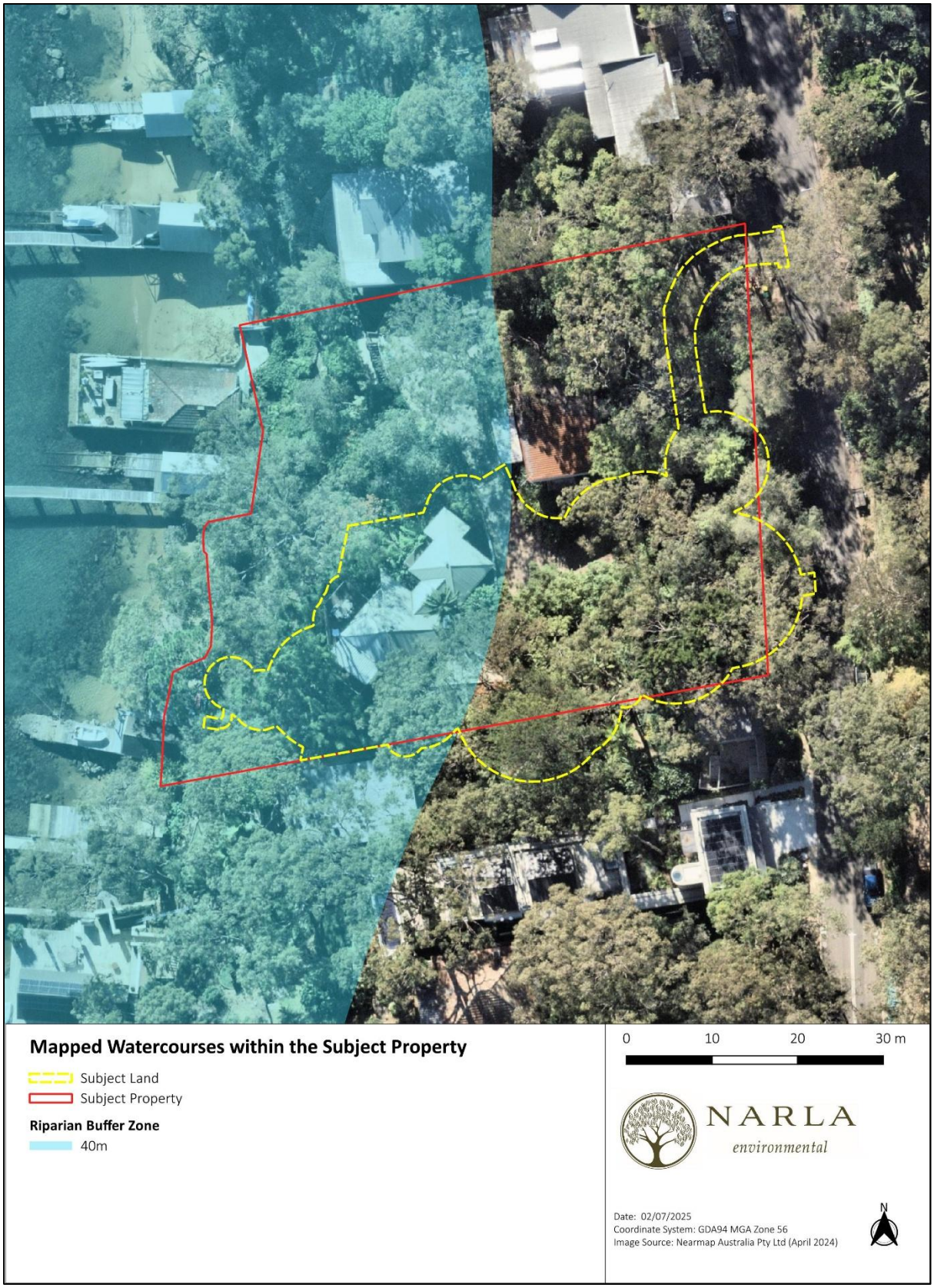

Figure 7. Watercourses and riparian buffer zones occurring within and adjacent to the Subject Land.

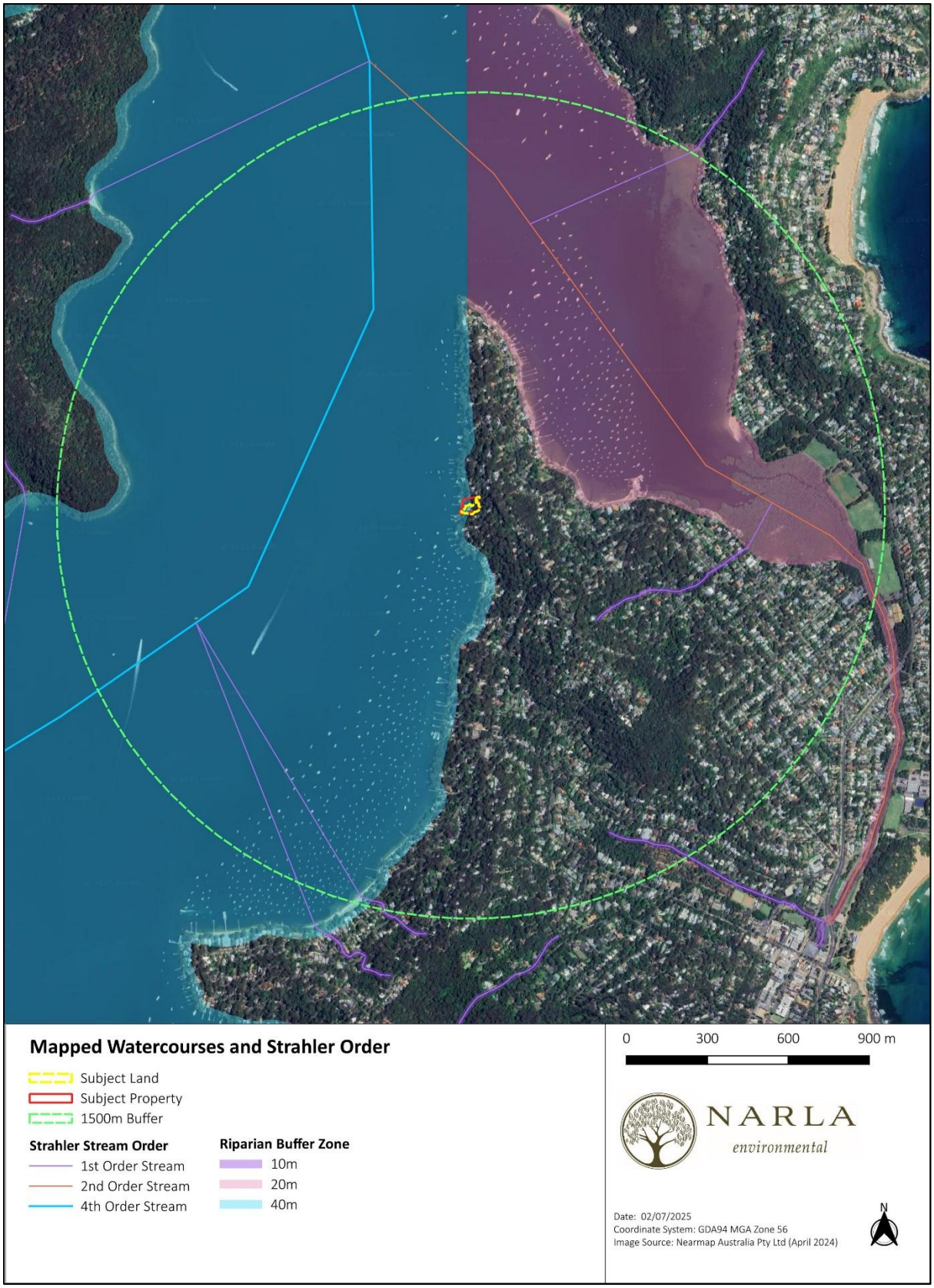

Figure 8. Rivers and streams (with associated riparian buffers) occurring within the 1,500m buffer.

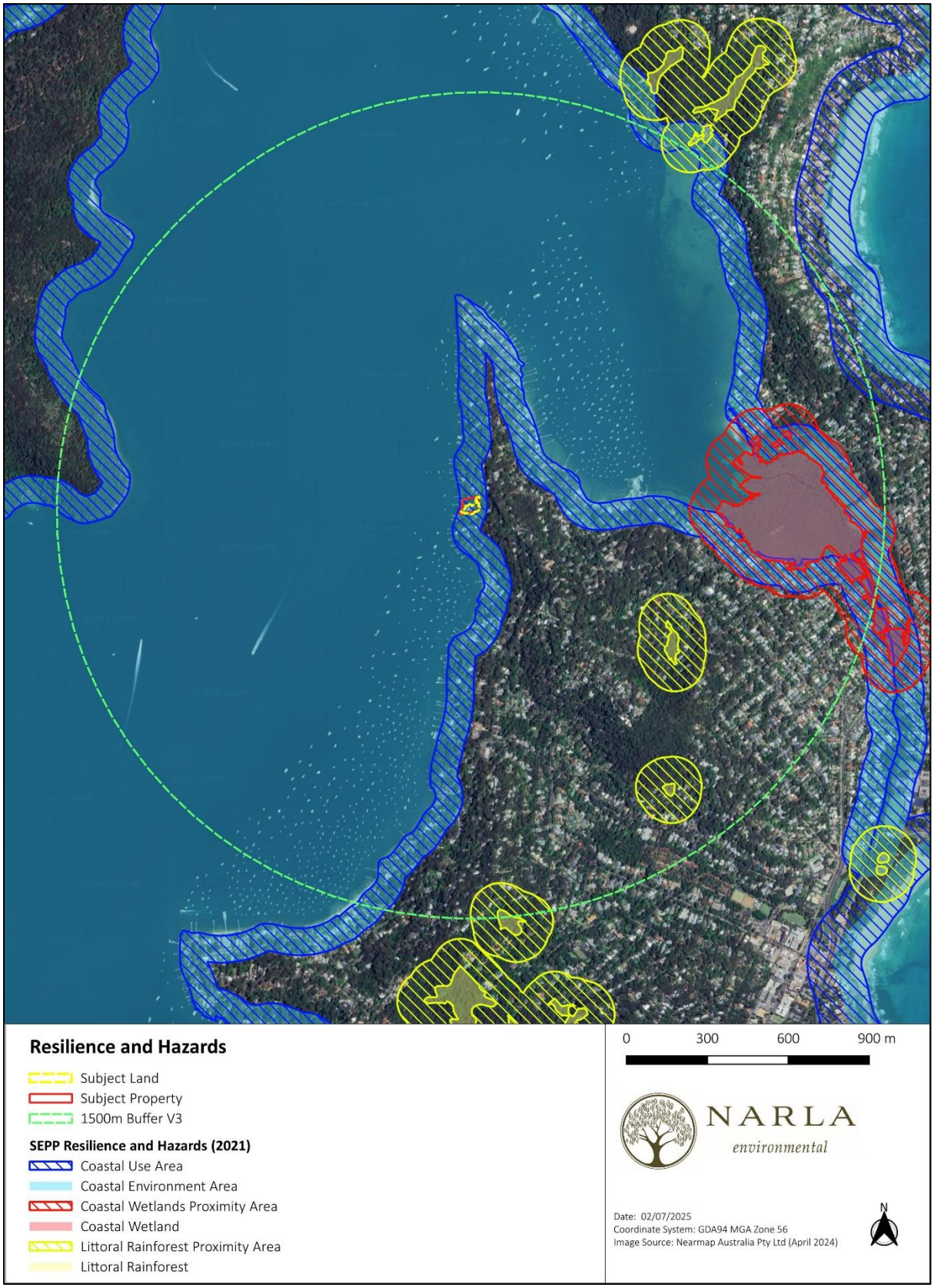

Figure 9. Areas mapped under the Resilience and Hazards SEPP within the Subject Property, Subject Land and within a 1,500m buffer.

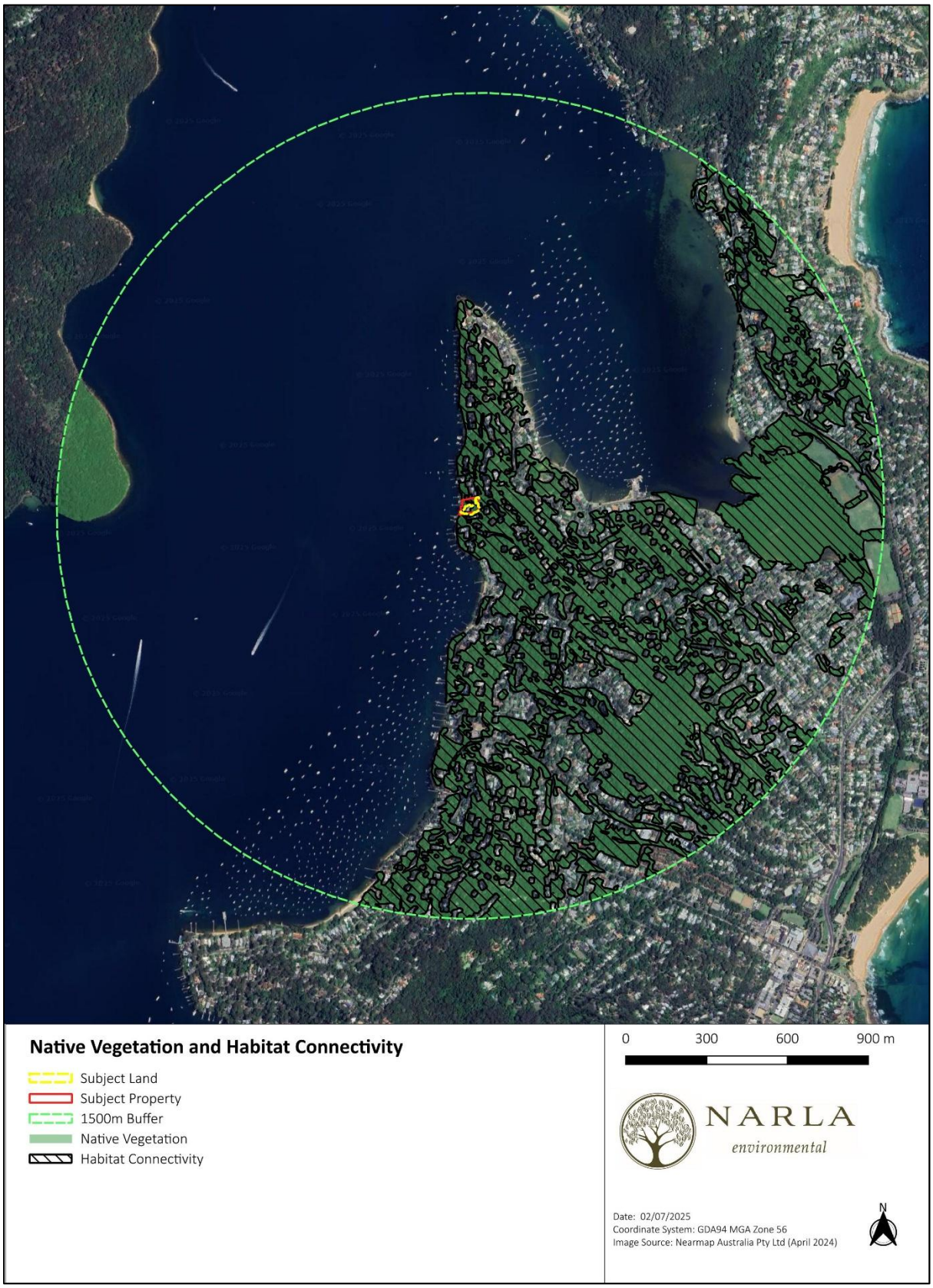

Figure 10. The extent of native vegetation within a 1,500m buffer.

3. Native Vegetation

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

3.1.1 Historically Mapped Vegetation

The Subject Land is mapped by the NSW State Vegetation Type Map (DPE 2022) as containing the following vegetation communities (Figure 11):

- PCT 3234: Hunter Coast Lowland Spotted Gum Moist Forest; and
- Not classified

3.1.2 Plant Community Type Selection Process

Plant Community Type selection for the vegetation community occurring on the Subject Land was undertaken using information and databases provided in the BioNet Vegetation Classification System (NDCCEEW 202e). The following selection criteria were used in the PCT Filter Tool to develop the PCT shortlist:

- IBRA Bioregion: Sydney Basin
- IBRA Subregion: Pittwater
- Dominant Species: *Allocasuarina torulosa* (Forest Oak), *Angophora costata* (Sydney Red Gum), *Corymbia maculata* (Spotted Gum), *Eucalyptus botryoides* (Bangalay), *Eucalyptus paniculata* (Grey Ironbark) and *Eucalyptus robusta* (Swamp Mahogany).

This process delivered a selection of two (2) PCT's that occur within the Pittwater IBRA Subregion (and Sydney Basin Bioregion) and that contained 6 out of 6 of the observed dominant species (i.e., the highest potential of occurring within the Subject Land). Plant Community Types reliant on rainforest were excluded as the Subject Land did not have such constraints that support these vegetation types. Therefore, the following two (2) candidate PCTs that contained consistent native species within the Subject Land were considered:

- PCT 3234: Hunter Coast Lowland Spotted Gum Moist Forest; and
- PCT 3594: Sydney Coastal Sandstone Foreshores Forest.

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 for two (2) candidate PCTs (Figure 11). The steps taken to justify the presence/absence of the candidate PCT within the Subject Land are detailed in Table 2.

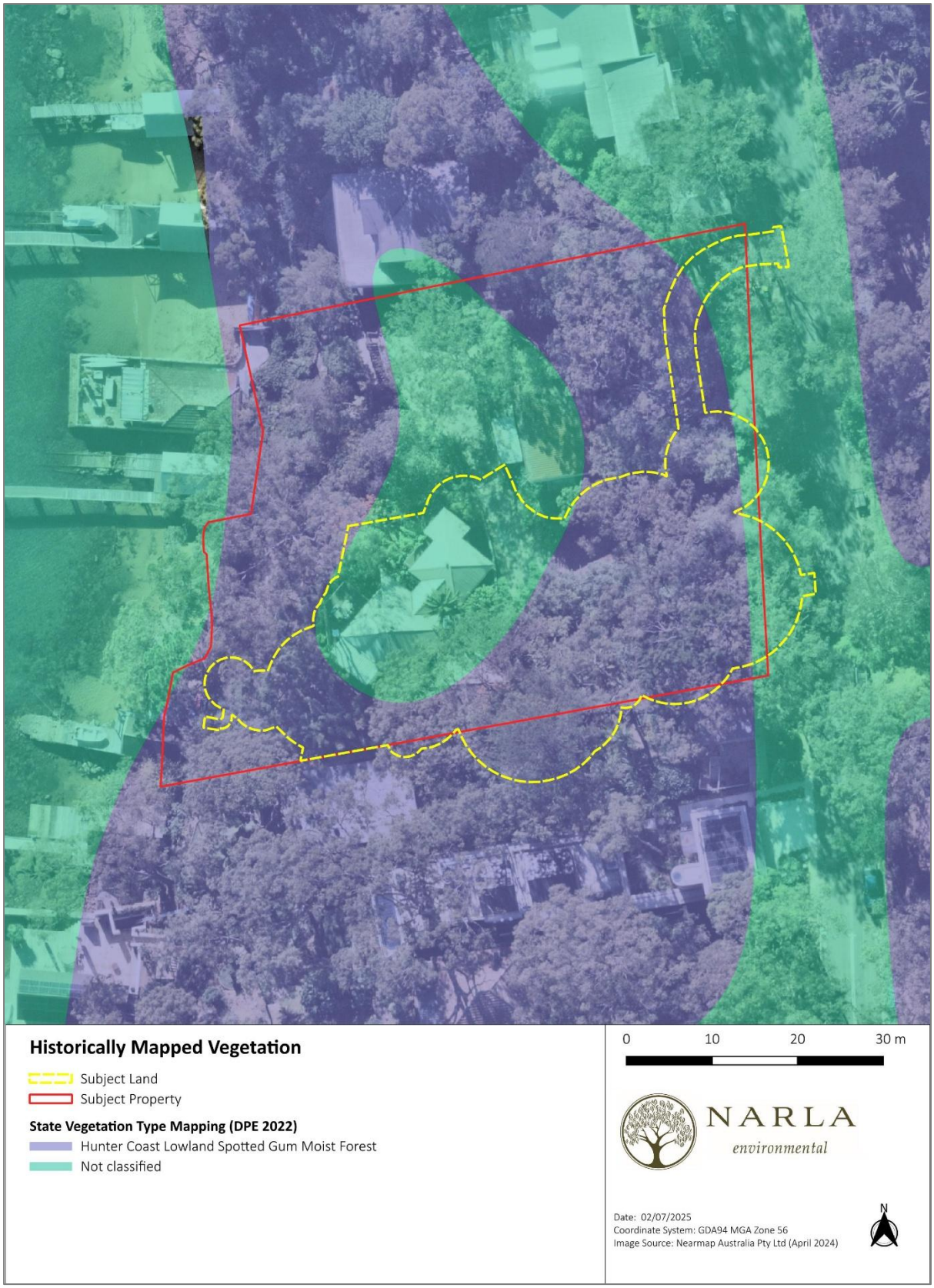

Figure 11. Historically mapped vegetation within and surrounding the Subject Land.

Table 2. Output from the PCT Filter Tool (NDCCEEW 2024e) 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	No. of Matches	*Allocasuarina torulosa*	*Angophora costata*	*Corymbia maculata*	*Eucalyptus botryoides*	*Eucalyptus paniculata*	*Eucalyptus robusta*
PCT 3234: Hunter Coast Lowland Spotted Gum Moist Forest	Yes. This PCT is common on low-lying Narrabeen sandstone escarpments and hills between Pittwater and the lower Central Coast between Wagstaff, Bouddi and Wamberal. The Subject Land is located on a Narrabeen sandstone.	6	✓	✓	✓	✓	✓	✓
PCT 3594: Sydney Coastal Sandstone Foreshores Forest	Yes. This PCT is found along the foreshores of major waterways and coastal escarpments of Sydney, mainly distributed between the Hacking River and Pittwater. The Subject Land occurs along the foreshore of Pittwater.	6	✓	✓	✓	✓	✓	✓

Table 3. PCT selection criteria. Green indicates the selected PCT.

Candidate PCT	PCT Description (NDCCEEW 2024e)	Justification
PCT 3234: Hunter Coast Lowland Spotted Gum Moist Forest	A tall to very tall sclerophyll open forest with a mid-stratum of mesophyll shrubs and a ground layer of grasses, graminoids and small climbers, found on sheltered Permo-Triassic sandstone escarpments and hills along the coastal lowlands between Pittwater and the Karuah River, central and lower North Coast. The tree canopy commonly includes a high cover of *Corymbia maculata*, occasionally with *Eucalyptus paniculata* and *Eucalyptus umbra* or another related species from the mahogany group of eucalypts. One or all of these species may be replaced or accompanied by a range of other species, occasionally including *Angophora costata*, rarely *Syncarpia glomulifera* or *Corymbia gummifera*. The mid-stratum is layered with a sparse cover of smaller trees that commonly includes *Allocasuarina torulosa*, eucalypt species, *Pittosporum undulatum* or *Glochidion ferdinandi*, and rarely *Allocasuarina littoralis*. Occasionally a sparse cover of *Livistona australis* may be present, though more frequently it is recorded in the lower shrub layer. Other members of the lower shrub layer very frequently include *Breynia oblongifolia,*	Narla have assigned this PCT to the vegetation within the Subject Land as it fits with the landscape profile and geology, and comprised the dominant diagnostic species. Furthermore, this PCT has also been historically mapped within the Subject Land.

Candidate PCT	PCT Description (NDCCEEW 2024e)	Justification
	commonly with *Notelaea longifolia*, and occasionally *Pittosporum undulatum*, *Pittosporum revolutum* and *Myrsine variabilis*. The ground layer has a high diversity of mesic climbers with *Eustrephus latifolius* and *Pandorea pandorana subsp. pandorana* almost always present. Grasses very frequently include *Imperata cylindrica* and *Entolasia stricta* and occasionally *Oplismenus imbecillis*, while the fern *Pteridium esculentum* is very frequent. The graminoids *Dianella caerulea* and *Lomandra longifolia* are almost always present. This PCT is common on low-lying Narrabeen sandstone escarpments and hills between Pittwater and the lower Central Coast between Wagstaff, Bouddi and Wamberal. From there, its distribution northwards is interrupted until Lake Macquarie, where it is more commonly associated with Permian sediments in similar low-lying coastal landscapes north to Newcastle. Northern outliers occur on either side of the Karuah River at Nelson Bay on Nerong Volcanic substrates. This community grades into dry shrub grass forests, PCT 3437 on adjoining exposed aspects in the coastal low elevation landscapes, and is replaced by PCT 3230 on coarser Narrabeen sandstone soils or in lower rainfall zones.	
PCT 3594: Sydney Coastal Sandstone Foreshores Forest	A tall, occasionally very tall, sclerophyll open forest with a mixed understorey of dry shrubs and mesic small trees found along the foreshores of major waterways and coastal escarpments of Sydney. The tree canopy is very frequently dominated by Angophora costata with occasional local stands of Eucalyptus botryoides or rarely other eucalypt species. A sparse taller layer in the mid-stratum commonly includes Banksia integrifolia or Allocasuarina littoralis and occasionally Ficus rubiginosa. A combination of hardy mesic small trees including Pittosporum undulatum, Glochidion ferdinandi and Elaeocarpus reticulatus are almost always present with Notelaea longifolia also common. In the suburban environment, the proliferation of these mesic species in the understorey at long unburnt sites has generated considerable debate, particularly as there appears to be strong correlation between time since fire and their density. Our data suggests these species are also more common in these littoral zones than other sheltered sandstone forests situated further away from the coast. Sclerophyll shrubs are less frequent however include Acacia longifolia, Acacia suaveolens, Breynia oblongifolia and Monotoca elliptica. The ground layer is characterised by a mid-dense cover of ferns, graminoids, climbers and grasses. The low elevations adjoining major waterways expose the vegetation to a maritime influence brought by salt laden southerly winds. This PCT is mainly distributed between the Hacking River and Pittwater. With increased elevation and distance from waterways this community typically grades into PCT 3592.	Narla have NOT assigned this PCT to the vegetation within the Subject Land. Although it is located within an appropriate geographic location, the most dominate canopy species within the Subject Land, *Corymbia maculata,* is not listed as a dominant species of this PCT. As such, this PCT was not considered best fit for the vegetation within the Subject Land.

3.1.3 Final PCT and Vegetation Zone Selection

The field survey conducted by experienced Narla Ecologists, Rebecca Sutton and Paul Mulligan, confirmed that one (1) PCT was identified within the Subject Land:

- PCT 3234: Hunter Coast Lowland Spotted Gum Moist Forest

One (1) native vegetation zone was identified within the Subject Land that consisted of the same condition class and vegetation type:

- Zone 1: PCT 3234 – Moderate Condition (Remnant Canopy).

The Landscaped and Exotic Vegetation was also assigned to the following vegetation zone within the Subject Land:

- Zone 2: Landscaped and Exotic Vegetation.

This vegetation zone is detailed in **Table 4** and displayed in **Figure 12**.

Table 4. PCT 3234 identified within the Subject Land.

PCT 3234: Hunter Coast Lowland Spotted Gum Moist Forest


PCT 3234: Hunter Coast Lowland Spotted Gum Moist Forest	
Vegetation Class	Northern Hinterland Wet Sclerophyll Forests
Total Area Within the Subject Land	0.12ha
Vegetation Zone	Zone 1: PCT 3234 – Moderate Condition (Remnant Canopy)
Field survey effort	One (1) 20m x 50m VIS plot was established. Due to the irregular shape of the vegetation zone, the BAM plot was partially situated outside the Subject Land to avoid where possible, the paved driveway that covers a portion of the Property, (**Figure 12**). The location chosen was however indicative of the vegetation community and condition class within the vegetation zone.
Description of vegetation	The vegetation within this zone was characterised by a native remnant canopy with some exotic species, and a disturbed native and exotic shrub and ground layer. Native canopy species were dominated by *Allocasuarina torulosa* (Forest Oak) and *Corymbia maculata* (Spotted Gum). Other canopy species included *Brachychiton acerifolius* (Illawarra Flame Tree), *Eucalyptus paniculata* (Grey Ironbark) and *Jacaranda mimosifolia* (Jacaranda). The shrub layer contained native species including *Pittosporum undulatum* (Sweet Pittosporum) and *Macrozamia communis* (Burrawang); however, it also contained exotics such as, *Lantana camara* (Lantana) *Ligustrum lucidum* (Large-leaved Privet), *Monstera deliciosa, Ochna serrulata* and *Phyllostachys* spp. (Bamboo). The ground layer was dominated by *Oplismenus aemulus* (Australian Basket Grass) with other sporadic natives including *Cayratia clematidea* (Native Grape), *Commelina cyanea*, *Desmodium rhytidophyllum Dichondra repens* (Kidney Weed), *Glycine tabacina* and *Microlaena stipoides* (Weeping Grass). Exotic species were also abundant in the ground layer including *Rumex sagittatus* (Turkey Rhubarb), *Ageratina Adenophora* (Crofton Weed), *Asparagus aethiopicus* (Ground Asparagus), *Bidens pilosa* (Cobblers Pegs), *Ehrharta erecta* (Panic Veldtgrass), *Hedera helix* (English Ivy), *Jasminum mesnyi* (Primrose Jasmine) and *Tradescantia fluminensis* (Trad).
Structure of vegetation	Native canopy cover was moderate within the VIS plot, with native trees totalling 21% cover. Native shrub coverage was low at just 3% and native ground cover was also low at 4 % grasses, 4% forbs, 3% ferns and 7% other. High Threat Exotic cover was medium within the plot at 4.4%. A moderate coverage of leaf litter (44%) was present. The VIS plot contained a high diversity of tree stem sizes, with tree stems recorded in most DBH classes, including regenerating stems, and the largest DBH range between 30-49cm. No (0) hollow-bearing trees were present, however 3m of fallen logs were identified within the plot.
BC Act 2016 Status	This vegetation conforms to the BC Act listed EEC Pittwater and Wagstaffe Spotted Gum Forest in the Sydney Basin Bioregion (see **Section 3.2.1**)
EPBC Act 1999 Status	Not Listed
Estimate of percent cleared	27.64%
Scientific Reference from VIS (DPIE 2023c)	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 5. Landscaped and Exotic Vegetation identified within the Subject Land

Landscaped and Exotic Vegetation	
	
Total area within the Subject Land (approximate)	0.04ha
Field Survey Effort	No VIS plots were established within this zone owing to its exotic nature.
Description of vegetation within the Subject Land	The vegetation within this zone consisted of high densities of exotic weed species and landscaped garden vegetation including *Rumex sagittatus* (Turkey Rhubarb), Agave *attenuate, Ageratina Adenophora* (Crofton Weed), *Euphorbia pulcherrim* (Poinsettia), *Jacaranda mimosifolia* (Jacaranda), *Jasminum mesnyi* (Primrose Jasmine), *Ligustrum sinense* (Small-leaved Privet), *Monstera deliciosa, Phyllostachys* sp. (Bamboo) and *Strelitzia nicolai* (Bird of Paradise). Priority weeds *Asparagus aethiopicus* (Ground Asparagus), *Asparagus virgatus* (Asparagus fern), *Cestrum parqui* (Green Cestrum), *Lantana camar*a (Lantana) and *Olea europaea* subsp. *cuspidate* (African Olive) were also present.
Justification of vegetation assignment	The vegetation within this zone consisted of environmental weeds and landscaped exotic species. The vegetation within the does not conform to a locally occurring PCT and was therefore classified as 'Landscaped and Exotic Vegetation'.
Associated TEC	None.

3.2 Threatened Ecological Communities

3.2.1 Biodiversity Conservation Act 2016

Hunter Coast Lowland Spotted Gum Moist Forest in Vegetation Zone 1 is associated with the BC Act listed EEC, Pittwater and Wagstaffe Spotted Gum Forest in the Sydney Basin Bioregion (PWSGF). Vegetation Zone 1 occurs on Narrabeen series geology in the Northern Beaches (formally Pittwater) LGA. Furthermore, the vegetation within the Subject Land includes the following canopy species listed in the final determination for PWSGF: *Angophora costata* (Sydney Red Gum)*, Corymbia maculata* (Spotted Gum), and *Eucalyptus paniculata* (Grey Ironbark). As such, Vegetation Zone 1 conforms to the BC Act listed EEC, PWSGF (**Figure 12**).

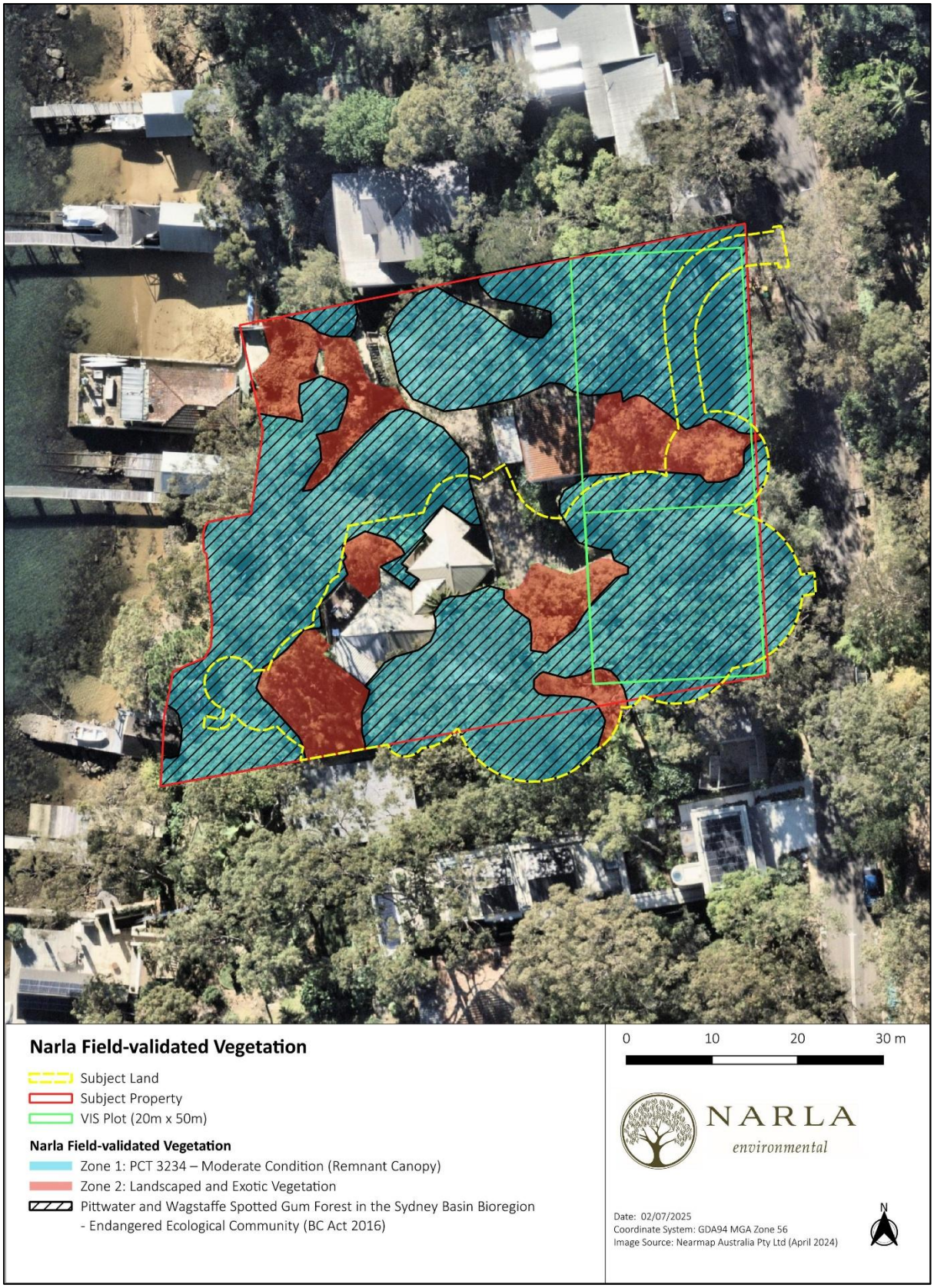

Figure 12. Narla field validated vegetation mapping and location of BAM VIS plot within and outside of the Subject Property.

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 Property were not assessed as part of the scope of this assessment, the vegetation zone identified within the Subject Land was separated into the following categories to allow for aerial mapping of patch size within the broader area (**Table 6**; **Figure 13**):

- Woody Ecosystems:
    - Zone 1: PCT 3234 – Moderate Condition (Remnant Canopy).

Table 6. Patch size class of the PCT and associated vegetation zone.

Plant Community Type	Category	Vegetation Zone	Patch Size Class
PCT 3234	Woody Ecosystems	Zone 1	>100ha

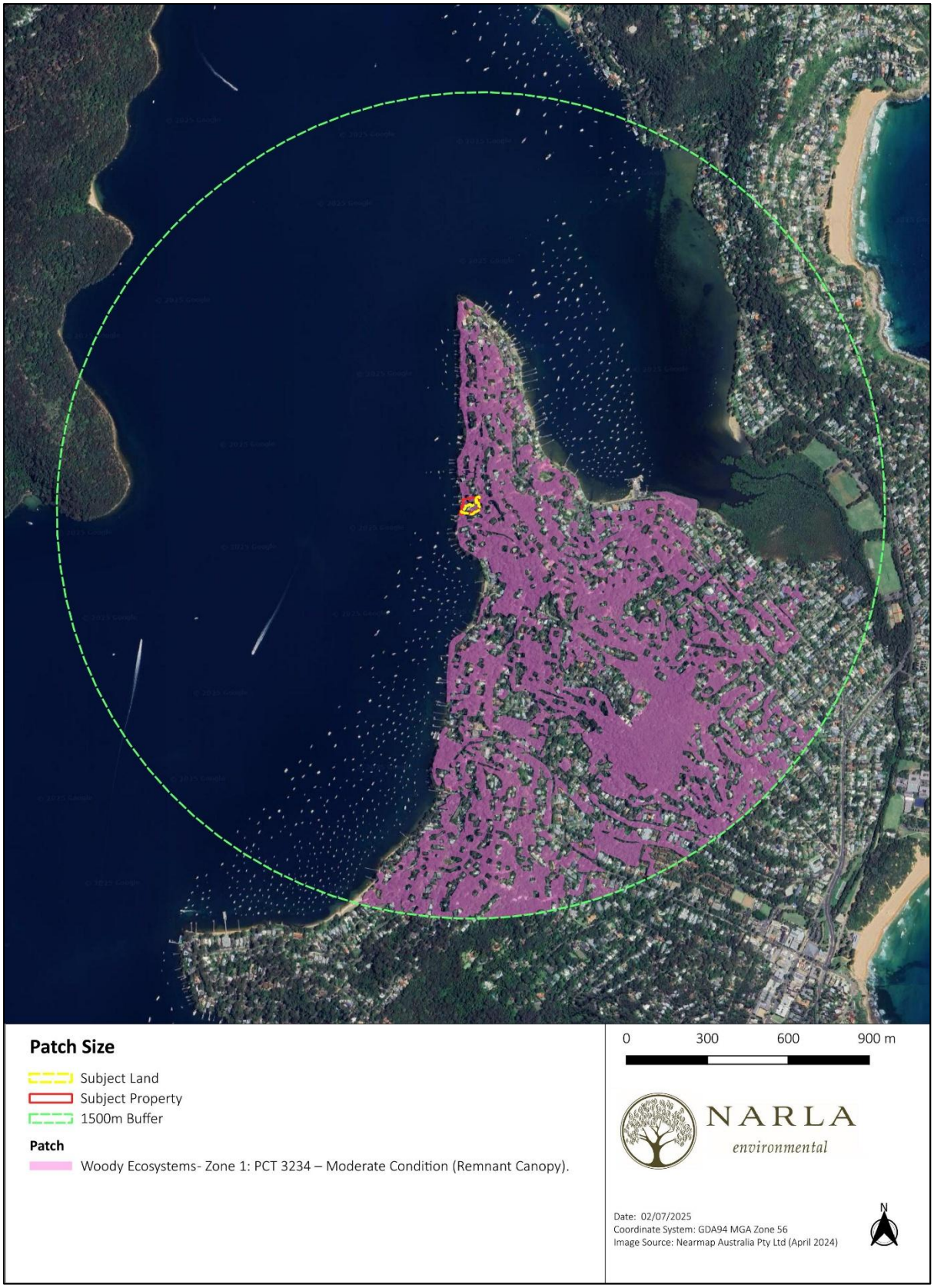

Figure 13. Patch size within the 1,500m buffer for the vegetation zone identified within the Subject Land.

3.4 Vegetation Integrity Survey (VIS) Plot

One (1) BAM VIS Plot was undertaken to determine the integrity score of the vegetation within the Subject Land. 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 the vegetation zone is detailed in **Table 7**.

3.4.1 Determining Future Vegetation Integrity Scores

Most projects will result in complete clearing of vegetation and threatened species habitat within the 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, Vegetation Zone 1 has been assigned the following management zone (**Figure 14**):

- Management Zone 1: PCT 3234 – Moderate Condition (Remnant Canopy) – Complete Removal.

The attributes influencing future vegetation scores within this management zone are detailed in **Table 8**. Owing to the exotic nature of the vegetation within Vegetation Zone 2, it not been assigned to a management zone and will not require further assessment.

Figure 14. Management zone within the Subject Land.

Table 7. Vegetation integrity scores for the identified zone.

PCT 3234: Hunter Coast Lowland Spotted Gum Moist Forest											
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 3234 – Moderate Condition (Remnant Canopy)	Management Zone 1 – Complete removal	0.12	1 x 1000m^2 (20m x 50m) VIS Plot	33.6	23.1	42.7	32.1	0	-32.1	-32.1	0

Table 8. Management zone 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 3234 – Moderate Condition (Remnant Canopy)	Management Zone 1 – Complete removal	All vegetation will be removed	N/A	▪ All vegetation within the development footprint is assumed to be required for removal to allow for the proposed development; and ▪ Future composition, structure and function score is 0.

4. Threatened Species

4.1 Candidate Ecosystem Credit Species

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

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

Scientific Name	BC Act Status	Sensitivity to gain class	Excluded from Assessment	Reason for Exclusion from Assessment
Anthochaera phrygia Regent Honeyeater (Foraging)	Critically Endangered	High	No	-
Artamus cyanopterus cyanopterus Dusky Woodswallow	Vulnerable	Moderate	No	-
Callocephalon fimbriatum Gang-gang Cockatoo (Foraging)	Endangered	Moderate	No	-
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo (Foraging)	Vulnerable	High	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	-
Glossopsitta pusilla Little Lorikeet	Vulnerable	High	No	-
Haliaeetus leucogaster White-bellied Sea-Eagle (Foraging)	Vulnerable	High	No	-
Hieraaetus morphnoides Little Eagle (Foraging)	Vulnerable	Moderate	No	-
Hirundapus caudacutus White-throated Needletail	Vulnerable	High	No	-
Ixobrychus flavicollis Black Bittern	Vulnerable	Moderate	No	-
Lathamus discolour Swift Parrot (Foraging)	Endangered	Moderate	No	-
Lophoictinia isura Square-tailed Kite (Foraging)	Vulnerable	Moderate	No	-
Melithreptus gularis gularis Black-chinned Honeyeater (eastern subspecies)	Vulnerable	Moderate	No	-
Micronomus norfolkensis Eastern Coastal Free-tailed Bat	Vulnerable	High	No	-

Scientific Name	BC Act Status	Sensitivity to gain class	Excluded from Assessment	Reason for Exclusion from Assessment
Miniopterus australis Little Bent-winged Bat (Foraging)	Vulnerable	High	No	-
Miniopterus orianae oceanensis Large Bent-winged bat (Foraging)	Vulnerable	High	No	-
Pandion cristatus Eastern Osprey (Foraging)	Vulnerable	Moderate	No	-
Petroica boodang Scarlet Robin	Vulnerable	Moderate	No	-
Petroica phoenicea Flame Robin	Vulnerable	Moderate	No	-
Pseudomys novaehollandiae New Holland Mouse	Vulnerable (EPBC Only)	High	No	-
Pteropus poliocephalus Grey-headed Flying-fox (Foraging)	Vulnerable	High	No	-
Ptilinopus superbus Superb Fruit-Dove	Vulnerable	Moderate	No	-
Saccolaimus flaviventris Yellow-bellied Sheathtail-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 (NDCCEEW 2024f). A summary of the targeted survey effort applied to each species is provided along with the results of the survey effort, specifically whether or not the species credit needs to be offset through retiring of Biodiversity Offset Credits (**Table 10**; **Table 11**).

Table 10. Candidate Fauna Credit Species predicted to occur within the Subject Land.

Scientific Name	Included in Assessment?	Targeted Survey conducted?	Present within Subject Land?	Biodiversity Risk Weighting	Biodiversity Offset Credits Required?
Anthochaera phrygia Regent Honeyeater (Breeding)	No, the Subject Land is not included on the map of important areas for Regent Honeyeaters.	No	N/A	Very High – 3	No
Chalinolobus dwyeri Large-eared Pied Bat	Yes. The SAII threshold for this species is potential breeding habitat and presence of breeding individuals. 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. Owing to the topography overhangs and crevices present within 100m of the Subject Land. Therefore, the SAII threshold is met for this species and it is required to be included in the assessment.	No	Assumed Present	Very High – 3	**Yes**
Lathamus discolour Swift Parrot (Breeding)	No, the Subject Land is not included on the map of important areas for Swift Parrots.	No	N/A	Very High – 3	No
Miniopterus australis Little Bent-winged Bat (Breeding)	No. This species is known to breed in caves, tunnels, mines and culverts. As such habitat constraints are not present within the Subject Land, this species was excluded from the assessment.	No	N/A	Very High – 3	No

Scientific Name	Included in Assessment?	Targeted Survey conducted?	Present within Subject Land?	Biodiversity Risk Weighting	Biodiversity Offset Credits Required?
Miniopterus orianae oceanensis Large Bent-winged Bat (Breeding)	No. This species is known to breed in caves, tunnels, mines and culverts. As such habitat constraints are not present within the Subject Land, this species was excluded from the assessment.	No	N/A	Very High – 3	No
Vespadelus troughtoni Eastern Cave Bat	Yes. The SAII threshold for this species is potential breeding habitat and presence of breeding individuals. 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. Sandstone outcropping is present that contains overhangs and crevices present within 100m of the Subject Land. Therefore, the SAII threshold is met for this species and it is required to be included in the assessment.	No	N/A	Very High – 3	Yes

Table 11. Candidate Flora Credit Species predicted to occur within the Subject Land.

Scientific Name	Included in Assessment?	Targeted Survey conducted?	Present within Subject Land?	Biodiversity Risk Weighting	Biodiversity Offset Credits Required?
Rhizanthella slateri Eastern Australian Underground Orchid	No. This species is only known from 10 populations, with the nearest known population in the Wiseman's Ferry area, approximately 76km away (NSW Scientific Committee 2003). Therefore, owing to the distance between the Subject Land and the nearest known population, this species was excluded from the assessment as it was considered unlikely to occur within the Subject Land.	No	N/A	Very High – 3	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 is present within the Subject Land, this species was included in the assessment.	Yes	No	Very High – 3	No
Rhodomyrtus psidioides Native Guava	Yes. Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest. As such habitat is present within the Subject Land, this species was included in the assessment.	Yes	No	Very High – 3	No

4.3 Species Credit Habitat Surveys

Species credit habitat surveys were undertaken for any SAII species credit species considered likely to have suitable habitat within the Subject Land (**Figure 15**). These surveys were implemented in accordance with Section 5.3 of the BAM and all relevant threatened species survey guidelines.

Habitat surveys were undertaken on Tuesday the 2nd August 2024 by experienced Narla Ecologists, Rebecca Sutton and Paul Mulligan, within the Subject Land and the areas immediately adjacent. Weather conditions taken from the nearest weather station (Terrey Hills, station no. 066059) in the lead up and during the field survey are outlined in **Table 12.**

Pre-survey weather conditions were generally not conducive for identifying threatened species and their habitats should they occur within the Subject Land. Small amounts of rainfall and mild temperatures in the week prior to the targeted flora surveys may not have provided ideal conditions for the flowering and/or emergence of the targeted flora species.

Table 12. Weather conditions taken from the nearest weather stations (Station number 066059) in the lead up and during the field survey (BOM 2024a; BOM 2024b). Survey date is in bold.

Timing/activities	Date	Day	Temperature		Rainfall (mm)
			Min	Max	
Lead up to the survey	26/07/2024	Friday	10.6	19.2	3.0
	27/07/2024	Saturday	8.3	16.4	3.4
	28/07/2024	Sunday	6.8	13.5	2.4
	29/07/2024	Monday	6.1	13.6	0
	30/07/2024	Tuesday	6.6	14.0	0
	31/07/2024	Wednesday	7.8	14.4	0.2
	1/08/2024	Thursday	7.2	14.3	0.2
Site Assessment & Habitat Survey	**2/08/2024**	**Friday**	**7.6**	**14.5**	**3.8**

4.3.1 Fauna Species Credit Survey

A total of six (6) SAII threatened fauna species were identified within the BAMC (DPE 2023f) as having the potential to occur within the Subject Land. Following the site assessment, four (4) species were excluded from assessment due to the following:

- Species are considered unlikely to occur and no further assessment is required for that species if it is determined that no habitat constraints are present on the entire Subject Land for the threatened species (as per Section 5.2.2 of the BAM, DPIE 2020a).

The following two species were required to be assumed present within the Subject Land due to suitable habitat occurring within close proximity:

- *Chalinolobus dwyeri* (Large-eared Pied Bat); and
- *Vespadelus troughtoni* (Eastern Cave Bat).

4.3.2 Flora Species Credit Survey

Three (3) SAII threatened flora species was identified within the BAMC (DCCEEW 2024f) as having the potential to occur within the Subject Land. During the site assessment only two (2) of these species were identified as having the potential to occur within the Subject Land due to suitable habitat.

A targeted survey was undertaken for *Rhodamnia rubescens* and *Rhodomyrtus* psidioides using parallel field traverses in accordance with the 'Surveying threatened plants and their habitats - NSW survey guide for the Biodiversity Assessment Method' (DPE 2020a; **Table 13**). This species was not detected within the Subject Land or Subject Property.

Table 13. Species credit flora species requiring targeted surveys.

Candidate Fauna Species	Survey Period (BAMC)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rhodamnia rubescens Scrub Turpentine								✓				
Rhodomyrtus psidioides Native Guava								✓				
Key	✓ = Time of Site Assessment						= NDCCEEW Endorsed Survey Period					

4.4 Species Polygons

4.4.1 Assumed Present

The following species were assumed present within the Subject Land as suitable habitat was identified in the locality during the site assessment:

- *Chalinolobus dwyeri* (Large-eared Pied Bat); and
- *Vespadelus troughtoni* (Eastern Cave Bat).

Where a species credit species is assumed to be present within the Subject Land, the assessor must assign a species polygon that encompasses the entire vegetation zone(s) within which the candidate species is predicted to occur (DPE 2023d).

The species polygon for these species is a 100m buffer around potential breeding habitat (rock outcropping with crevices) which encompasses all of PCT 3234 within the Subject Land (DPE 2024d; **Figure 16**).

4.4.2 Confirmed Present

No SAII species were confirmed to be present within or surrounding the Subject Land.

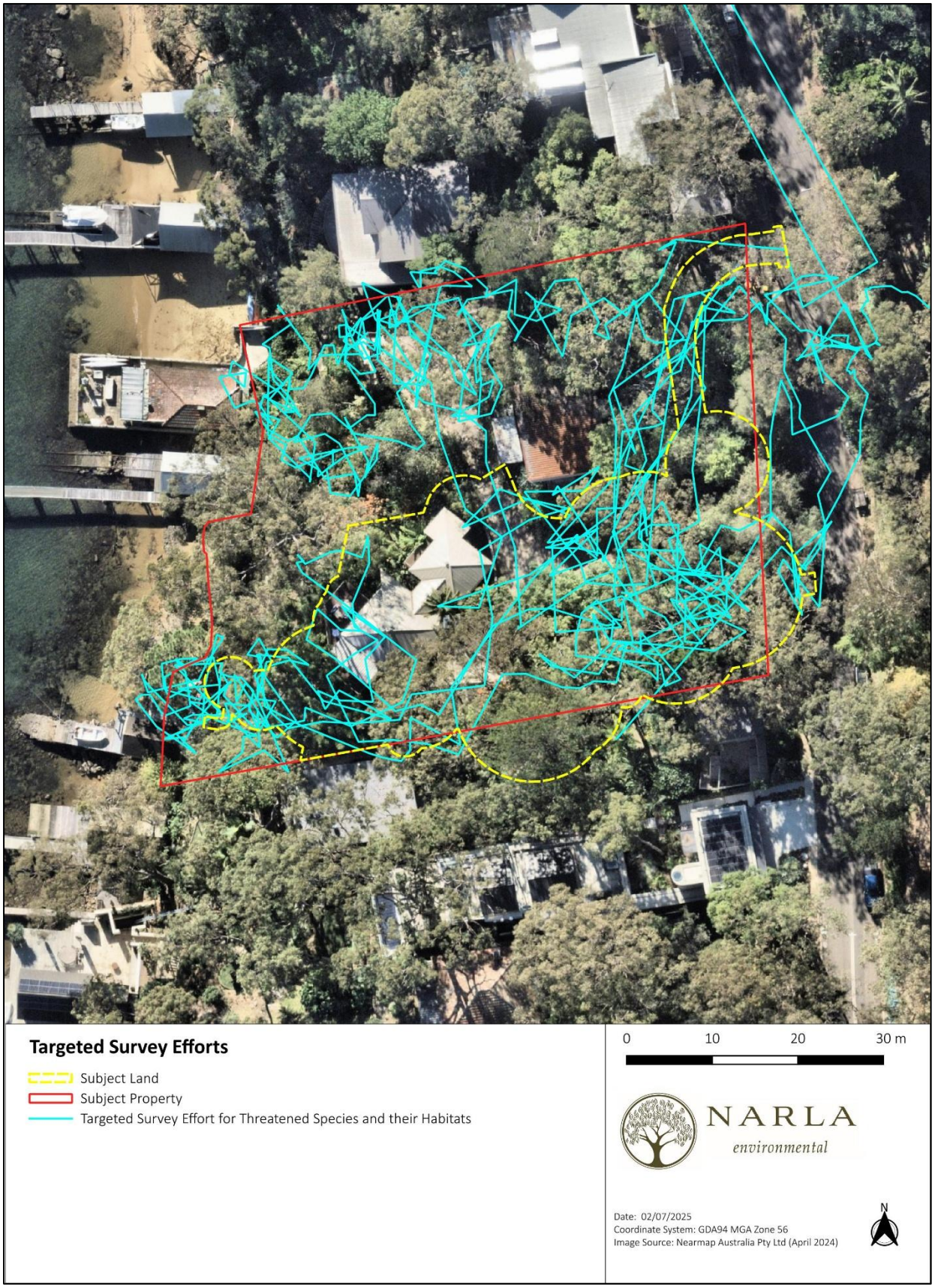

Figure 15. Targeted survey effort for species credit species and their habitats within the Subject Land.

Figure 16. Targeted survey effort for species credit species and their habitats within the Subject Land.

5. Prescribed Impacts

Certain projects may have impacts on biodiversity values in addition to, or instead of, impacts from clearing vegetation and/or loss of habitat. For many of these impacts, the biodiversity values may be difficult to quantify, replace or offset, making avoiding and minimising impacts critical. Prescribed biodiversity impacts require an assessment of the impacts of the development on the habitat of threatened species or ecological communities. This is discussed in **Table 14**.

Table 14. 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, or human-made structures on the Subject Land. Non-native vegetation was present within the Subject Land in the form of common environmental weeds and garden escapees. No threatened species predicted to occur within the Subject Land are believed to be reliant on this exotic vegetation.
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 extensive areas of habitat connectivity will continue to exist in vegetated areas surrounding the Subject Land.
That affect water quality, water bodies and hydrological processes that sustain threatened entities (including from subsidence or upsidence from underground mining).	No	There are no confirmed threatened species and ecological communities within the Subject Land that are sustained by water bodies and hydrological processes. 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 small nature of the proposed development, it is highly unlikely that vehicle strikes will be an issue given the only vehicle use would be along a raised vehicular platform.

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 development (**Table 15**).

Table 15. Avoidance, minimisation and mitigation of impacts associated with the proposed development.

Action	Outcome	Timing	Responsibility
Avoid and Minimise Impact - Project Location and Design	Due to the nature of the property, there are limited alternate locations for the proposed development. The proponent has designed the development on areas containing remnant canopy vegetation with a degraded and weed infested ground and shrub layer. A total of forty-two (42) individual trees are recommended for removal, of which eighteen (18) are local native species (Martin Peacock Tree Care 2024). Forty-eight (48) advanced trees are be planted as part of the proposed landscaping (Myles Baldwin Design 2024).	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	Prior to construction, the applicant should commission the services of a qualified and experienced Ecologist Consultant (minimum 3 years' experience) with a minimum tertiary degree in Science, Conservation, Biology, Ecology, Natural Resource Management, Environmental Science or Environmental Management. The Ecologist must be licensed with a current Department of Primary Industries Animal Research Authority permit and New South Wales Scientific License issued under the BC Act. The Ecologist will be commissioned to: ▪ Undertake an extensive pre-clearing survey, delineating habitat-bearing trees and shrubs to be retained/removed; and ▪ Supervise the clearance of trees and shrubs (native and exotic) in order to capture, treat and/or relocate any displaced fauna.	Prior to and during vegetation clearance works	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.	Prior to and during vegetation clearance works, Construction phase; Post-construction phase	Proponent
Landscaping	Future landscaping efforts should incorporate vegetation representative of PCT 3234: Hunter Coast Lowland Spotted Gum Moist Forest	Post-construction phase	Proponent

Action	Outcome	Timing	Responsibility
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)	All storage, stockpile and laydown sites must remain within the allocated stockpile locations. 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

7.1.1 Full Clearing

The proposed works will result in impacts the following vegetation:

- 0.12ha of PCT 3234, which conforms to the EEC Pittwater and Wagstaffe Spotted Gum Forest in the Sydney Basin Bioregion; and
- 0.04ha of Landscaped and Exotic Vegetation.

7.1.2 Partial Clearing

No partial clearing will occur as a result of the proposed development.

7.2 Prescribed Impacts

There will be no prescribed impacts on threatened entities associated with the proposed development.

7.3 Indirect Impacts

Indirect impacts occur when the proposal or activities relating to the construction or operation of the proposal affect native vegetation, threatened ecological communities and threatened species habitat beyond the Subject Land. Impacts may also result from changes to land-use patterns, such as an increase in vehicular access and human activity on native vegetation, threatened ecological communities and threatened species habitat. The indirect impacts of this proposed development are outlined in **Table 16.**

Table 16. 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 may increase weed infestations within adjacent vegetation, which in turn may decrease its habitat value. Additionally, the proposed development may indirectly impact the vegetation surrounding the Subject Land through accidental Trampling. The proposed development has the potential to alter the natural hydrology occurring within the area due to an increase in hard surfaces. This in turn may negatively impacting vegetation downslope of the Subject Land by altering natural runoff.	One (1) TEC occurs within and adjacent the Subject Land – Pittwater and Wagstaffe Spotted Gum Forest in the Sydney Basin Bioregion. There is also the potential that threatened species occur in areas adjacent the Subject Land that may be impacted by a decrease in habitat condition and direct impacts such as trampling.	While changes to vegetation condition, hydrology and threats of trampling may have a localised impact to threatened species, threatened ecological communities and their habitats, this is not expected to impact on their bioregional persistence.
(b) reduced viability of adjacent habitat due to edge effects	The proposed construction may lead to an increase in weed infiltration into adjacent habitat due to enhanced edge effects however, the surrounding area is comprised of heavily urbanised properties, therefore it is unlikely	One (1) TEC occurs within and adjacent the Subject Land – Pittwater and Wagstaffe Spotted Gum Forest in the Sydney Basin Bioregion. There is	While edge effects may have a localised impact to TECs and threatened species, this is not expected to impact on their bioregional persistence, considering

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.
	that the proposed development will exacerbate these impacts more than is already present. Additionally, due to the small nature of proposed development, it is unlikely that this will impact local species moving between areas. Any impacts are expected to be restricted to the immediate area surrounding the Subject Land to a couple of metres.	also the potential that threatened species occur in areas adjacent the Subject Land. The TEC and threatened species may be impacted by edge effects leading to a reduced viability in habitat.	the areas of habitat connectivity that continue to exist within the surrounding areas.
(c) reduced viability of adjacent habitat due to noise, dust or light spill	An increase in noise is to be expected during construction. As the Subject Land is located in a residential area, this is not expected to have an impact on any species roosting adjacent to the site during the day as they would be 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 may increase dust in adjacent habitat. Dust can impact on a plant's ability to photosynthesise and may increase plant mortality in the adjacent vegetation. However, this is not expected to have such an impact to decrease the viability of adjacent habitat.	One (1) TEC occurs within and adjacent the Subject Land – Pittwater and Wagstaffe Spotted Gum Forest in the Sydney Basin Bioregion. There is also the potential that threatened species occur in areas adjacent the Subject Land. Threatened species may be impacted by an increase in noise and dust spill into adjacent habitats, although this will be primarily restricted to the construction period.	While the construction may have a localised impact to the TEC and threatened species, this is not expected to impact on their bioregional persistence. The areas of habitat connectivity that continue to exist within the surrounding areas will allow their movement away from potentially 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.
	Construction will occur during normal working hours and as such, light spill is not expected to affect adjacent habitat.		
(d) transport of weeds and pathogens from the site to adjacent vegetation	As previously discussed, the proposed construction may lead to an increase in weed infiltration restricted to the immediate area surrounding the Subject Land to a couple of metres due to enhanced edge effects. However, weeds are not expected to 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 occurs within and adjacent the Subject Land – Pittwater and Wagstaffe Spotted Gum Forest in the Sydney Basin Bioregion. There is also the potential that threatened species occur in areas adjacent 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 and pathogens may have a localised impact to TECs and threatened species, this is not expected to impact on their bioregional persistence considering the patchy habitat connectivity within the surrounding areas.
(e) increased risk of starvation, exposure and loss of shade or shelter	Given the tree removal proposed, there is an increased risk that any threatened fauna would be exposed to increased risks from starvation, exposure, and loss of shade or shelter as a result of the proposed development; however, this risk is small given the small area of impact. No habitat is to be removed beyond the Subject Land, although disturbances from noise during construction and operation may deem such habitats unsuitable for certain species (for a short time). However, due to the areas of habitat connectivity that continue to exist within the	There is the potential that threatened species occur in areas adjacent the Subject Land. These threatened species may be impacted by an increased risk of starvation, exposure and loss of shade or shelter.	While the proposed development may have a localised impact to threatened species, this is not expected to impact on their bioregional persistence. The areas of habitat connectivity that continue to exist within the surrounding areas will allow their movement away from potentially 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.
	surrounding areas, it is unlikely that this impact will be significant as such habitats will continue to provide food resources and shelter for fauna species, along with the retained vegetation within the greater Subject Property.		
(f) loss of breeding habitats	An increase in noise is to be expected during and post-construction; however, the surrounding area contains urbanised properties and roads, therefore it is unlikely that the proposed development will exacerbate these impacts more than is already present. The removal of native vegetation may reduce breeding habitat for nesting animals and may reduce prey presence for predatory species such as owls, thereby reducing their breeding habitat. As such, there is potential for disturbance to breeding habitats directly adjacent to the Subject Land.	There is potential that threatened fauna species use habitat adjacent to the Subject Land for breeding. Such species may be impacted by an increase in noise, exposure, fragmentation and loss of vegetation which may impact on their breeding habitat.	This impact is expected to be localised and will not have an overall impact on the bioregional persistence of threatened species. The areas of habitat connectivity that continue to exist within the surrounding areas will allow their movement away from potentially impacted areas.
(g) trampling of threatened flora species	No threatened flora species were identified within the Subject Land. The lack of proximal records makes it unlikely that any species would be present within the Subject Land and adjacent areas. It is unlikely that trampling of these threatened species will be associated with this project.	N/A	N/A
(h) inhibition of nitrogen fixation and increased soil salinity	Most types of human disturbance can inhibit nitrogen fixation however there is only a small area being disturbed for the proposed development and therefore it is unlikely	N/A	N/A

Indirect Impact	Nature, Extent and Duration	TEC's/PCTs and/or Threatened Species and Their Habitat Likely to be Impacted	Consequences of the Impacts for the Bioregional Persistence of the Threatened Species, Threatened Ecological Communities and Their Habitats.
	that this will cause any noticeable impacts to adjacent vegetation. Increased soil salinity may result due to clearing of vegetation leading to the rising of the water table. However, clearing will be limited to the Subject Land and will only impact the immediate area surrounding the Subject Land to a couple of metres.		
(i) fertiliser drift	This issue is not likely to affect the vegetation within or surrounding the Subject Land. Although fertiliser may be used in weed control, no fertiliser drift is expected.	N/A	N/A
(j) rubbish dumping	There is the possibility that rubbish dumping (including littering) in adjacent vegetation increases during construction; however, the surrounding area is comprised of heavily urbanised properties, therefore it is unlikely that the proposed development will exacerbate these impacts more than is already present. The dumping/littering of food resources may provide a food source for fauna. 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 TECs or threatened species.
(k) wood collection	This issue is not likely to affect the vegetation surrounding the Subject Land during and post-construction, particularly as the majority of vegetation surrounding the Subject Land cannot be accessed as it is private property.	N/A	N/A

Indirect Impact	Nature, Extent and Duration	TEC's/PCTs and/or Threatened Species and Their Habitat Likely to be Impacted	Consequences of the Impacts for the Bioregional Persistence of the Threatened Species, Threatened Ecological Communities and Their Habitats.
(l) bush rock removal and disturbance	This issue is not likely to affect the vegetation surrounding the Subject Land. No bush rock was observed within or adjacent to the Subject Land.	N/A	N/A
(m) increase in predatory species populations	There is potential that predatory species, such as foxes and cats, 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, however, this increase will be limited to the time of construction works.	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.	An increase in predatory species adjacent to the Subject Land may have widespread ramifications for any locally occurring threatened species. In particular, the patchy areas of habitat connectivity adjacent to the Subject Land will allow for the movement of predatory species across the wider landscape.
(n) increase in pest animal populations	There is potential that pest animal populations 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, however, this increase will be limited to the time of construction works.	There is potential that threatened fauna species use habitat adjacent to the Subject Land. Such species may be impacted by an increase in pest animal populations.	An increase in pest animal species adjacent to the Subject Land may have widespread ramifications for any locally occurring threatened species. In particular, the patchy areas of habitat connectivity adjacent to the Subject Land will allow for the movement of pest animal species across the wider landscape.
(o) increased risk of fire	The Subject Land is not identified as occurring within bushfire prone land. Furthermore, the small size of the	N/A	N/A

Indirect Impact	Nature, Extent and Duration	TEC's/PCTs and/or Threatened Species and Their Habitat Likely to be Impacted	Consequences of the Impacts for the Bioregional Persistence of the Threatened Species, Threatened Ecological Communities and Their Habitats.
	proposed works is not expected to alter the bushfire risk of vegetation surrounding the Subject Land.		
(p) disturbance to specialist breeding and foraging habitat, e.g., beach nesting for shorebirds.	No specialist breeding and foraging habitat was identified within or adjacent to the Subject Land. Therefore, it is not expected that the proposed development will disturb any specialist breeding and foraging habitat.	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:

- 0.12ha representative of PCT 3234: Hunter Coast Lowland Spotted Gum Moist Forest

The purchase and retirement of Biodiversity Offset Credits will be required for the 0.03ha of vegetation within Zone 1: Canopy, representative of PCT 3234 (**Figure 17**). No offsets are required for the impacts associated with Vegetation Zone 2 owing its exotic nature.

8.2 Impacts on Threatened Species

The following threatened species have been assumed present within the Subject Land and will require the purchase and retirement of Biodiversity Offset Credits:

- *Chalinolobus dwyeri* (Large-eared Pied Bat); and
- *Vespadelus troughtoni* (Eastern Cave Bat).

Figure 17. Impacts on native vegetation and offset requirements.

8.3 Serious and Irreversible Impacts (SAII's)

One (1) threatened ecological community and two (2) assumed present threatened species within the Subject Land have been identified as entities at risk of an SAII in the Threatened Biodiversity Data Collection (NDCCEEW 2024d):

- Pittwater and Wagstaffe Spotted Gum Forest in the Sydney Basin Bioregion;
- *Chalinolobus dwyeri* (Large-eared Pied Bat); and
- *Vespadelus troughtoni* (Eastern Cave Bat).

8.3.1 Pittwater and Wagstaffe Spotted Gum Forest in the Sydney Basin Bioregion

The threshold for consideration of SAII for Pittwater and Wagstaffe Spotted Gum Forest in the Sydney Basin Bioregion is currently under development. This means that any impact on the potential habitat for this ecological community could be considered 'serious and irreversible'. Due to the potential sensitivity of this ecological community to any impact, a determination of whether or not the proposed impacts are serious and irreversible is to be undertaken in accordance with Section 9.1 of the BAM (DPIE 2020a) as outlined in Table 17.

Table 17. Additional impact assessment provisions for ecological communities that are associated with a serious and irreversible impact.

Serious and Irreversible Impact (SAII) Impact assessment provisions for ecological communities: Pittwater and Wagstaffe Spotted Gum Forest in the Sydney Basin Bioregion	
BC Act Status: Endangered	
a) the action and measures taken to avoid the direct and indirect impact on the potential entity for a SAII	The Proposed Development where possible has utilised the footprint of the existing dwelling to minimise impacts to native vegetation The proposed development will only impact approximately 0.12ha of PWSGF.
b) the area (ha) and condition of the threatened ecological community (TEC) to be impacted directly and indirectly by the proposed development. The condition of the TEC is to be represented by the vegetation integrity score for each vegetation zone	The proposed development will impact on approximately 0.12ha of Vegetation Zone 1: Moderate Condition (Remnant Canopy). of PWSGF. Vegetation Zone 1 comprised a mixed native/exotic canopy, shrub and ground layer. The zone was of moderate condition, with a VI Score of 32.1. There is the potential for the proposed development to have an indirect impact on PWSGF not being removed within and surrounding the Subject Land (approximately 0.12ha).
c) a description of the extent to which the impact exceeds the threshold for the potential entity that is specified in the Guideline for determining an SAII	The impact thresholds for this community are currently under development.
d) the extent and overall condition of the potential TEC within an area of 1,000ha, and then	The NSW State Vegetation Type Map (DPE 2022) indicates the presence of approximately 80ha of PWSGF within an area of 1,000ha surrounding the Subject Land, and 254ha of PWSGF within an area of 10,000ha surrounding the Subject Land.

Serious and Irreversible Impact (SAII) Impact assessment provisions for ecological communities: Pittwater and Wagstaffe Spotted Gum Forest in the Sydney Basin Bioregion		
BC Act Status: Endangered		
10,000ha, surrounding the proposed development footprint	The PWSGF within these areas largely comprises fragmented patches of varying sizes. The conditions of these patches cannot be determined without ground truthing, although are expected to be partially degraded due to their positioning within a residential landscape.	
e) an estimate of the extant area and overall condition of the potential TEC remaining in the IBRA subregion before and after the impact of the proposed development has been taken into consideration	The NSW State Vegetation Type Map (DPE 2022) indicates approximately 310ha of PWSGF occurs within the Pittwater IBRA Subregion. This comprises fragmented patches of varying sizes. The conditions of these patches cannot be determined without ground truthing. Overall, the impact of the proposed development will result in the removal of 0.12ha, accounting for 0.04% of the extant area of PWSGF in the Pittwater IBRA Subregion. This will result in approximately 309.88ha of PWSGF remaining within the Pittwater IBRA Subregion after the proposed development.	
f) an estimate of the area of the candidate TEC that is in the reserve system within the IBRA region and the IBRA subregion	Approximately 33% of the remaining stands of the community are reserved, including 47ha in Bouddi National Park and 3ha in Brisbane Water National Park (Bell 2009). Thirty-seven hectares have been mapped within Ku-ring-gai Chase National Park but this has not been substantiated in more recent studies. Within the Pittwater (now Northern Beaches) LGA, 50ha of the community occur in Council reserves including Stapleton Park and McKay, Crown of Newport, and Angophora bushland reserves (NSW Scientific Committee 2013).	
g) the development, clearing or biodiversity certification proposal's impact on:	i) abiotic factors critical to the long-term survival of the potential TEC; for example, how much the impact will lead to a reduction of groundwater levels or the substantial alteration of surface water patterns	The proposed development has the potential to alter the natural hydrology occurring within and surrounding the Subject Land due to excavation works during construction, the installation of buildings, and an increase in hard surfaces. This may alter water runoff levels and increase nutrients into adjacent areas of PWSGF, causing an increase in weed infestations.
	ii) characteristic and functionally important species through impacts such as, but not limited to, inappropriate fire/flooding regimes, removal of understorey species or harvesting of plants	The areas of PWSGF within the Subject Land are of a moderate quality with a mixed exotic/native canopy, shrub and ground layer. Fire and flood regimes have been largely altered due to the residential development that has occurred in the area. Therefore, it is highly unlikely that the proposed development will exacerbate impacts on characteristic and functionally important species as the area is already highly altered. It is not expected that the proposed development will impact any characteristic and functionally important species outside of the Subject Land.

Serious and Irreversible Impact (SAII) Impact assessment provisions for ecological communities: Pittwater and Wagstaffe Spotted Gum Forest in the Sydney Basin Bioregion		
BC Act Status: Endangered		
	iii) the quality and integrity of an occurrence of the potential TEC through threats and indirect impacts including, but not limited to, assisting invasive flora and fauna species to become established or causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants which may harm or inhibit growth of species in the potential TEC	The proposed development may enhance weed infiltration into adjacent habitat by an increase in edge effects.
h) direct or indirect fragmentation and isolation of an important area of the potential TEC	The PWSGF within the Subject Land and surrounds does not occur within a 'Priority Management Area' as defined under the Saving our Species Program (DPIE 2019b). Therefore, the development will not directly or indirectly fragment or isolate an important area of PWSGF.	
i) the measures proposed to contribute to the recovery of the potential TEC in the IBRA subregion.	The Saving our Species Program (DPIE 2019b) has identified various measures proposed to manage key threats to conserve this ecological community, including: ▪ Liaise with relevant fire authority (National Parks and Wildlife Service, Rural Fire Service) to develop and implement fire plans as per the TEC thresholds (Fire no more than once every 10 years).; ▪ Provide landholders with information about threats to the TEC including habitat loss, clearing, illegal tree and understorey removal, weeds, fire, erosion, encroachment and disease. Methods of engagement can include workshops, letter-box drops, media campaigns, field days etc. Consult with landholders about participating in conservation agreements (preferably long-term in perpetuity) to protect the TEC on their property; ▪ Undertake active weed control for invasive species that compete with native species, including aerial spraying. Primary weed control to be undertaken in year 1, followed by secondary weed control annually (where required); ▪ Close illegal tracks at strategic sites to restrict access by recreational users. Develop and implement a rehabilitation plan to re-vegetate closed tracks. Locally sourced seed from species listed on the Scientific Determination will be used for re-vegetation and should represent all stratum of the TEC; ▪ Install fencing at strategic sites to restrict access by recreational users; and ▪ Install signage in National Parks and Council reserves to educate the community about the TEC and threats to it, including disease.	

Serious and Irreversible Impact (SAII) Impact assessment provisions for ecological communities: Pittwater and Wagstaffe Spotted Gum Forest in the Sydney Basin Bioregion	
BC Act Status: Endangered	
	A number of impact mitigation measures are to be implemented by the proponent before, during and after construction to avoid and minimise the impacts of the proposed development on PWSGF (see Table 15).

8.3.2 *Chalinolobus dwyeri* (Large-eared Pied Bat) and *Vespadelus troughtoni* (Eastern Cave Bat)

The SAII threshold for *Chalinolobus dwyeri* (Large-eared Pied Bat) and *Vespadelus troughtoni* (Eastern Cave Bat) is potential breeding habitat and presence of breeding individuals. As potential breeding habitat (rock outcrop with crevices) was identified adjacent to the Subject Land, these species are therefore required to be assumed present.

Potential breeding habitat for these species are PCTs associated with the species within 100m of rocky areas containing caves, overhangs, crevices, cliffs or escarpments; or within 100m of old mines, tunnels, culverts or derelict concrete buildings (DPE 2024d). As rock outcropping with crevices is likely to be present in the broader locality, which could provide potential breeding habitat for these species, the SAII threshold is met as it is assumed present.

Due to the sensitivity of these species to any impact, a determination of whether or not the proposed impacts are serious and irreversible is to be undertaken in accordance with Section 9.1 of the BAM (DPIE 2020a) is required. This is outline in Table 18.

Table 18. Additional impact assessment provisions for ecological communities that are associated with a serious and irreversible impact.

Serious and Irreversible Impact (SAII) Impact assessment provisions for threatened species or populations *Chalinolobus dwyeri* (Large-eared Pied Bat) *Vespadelus troughtoni* (Eastern Cave Bat).	
BC Act Status: Vulnerable	
a) the action and measures taken to avoid the direct and indirect impact on the potential entity for an SAII	The proposed development will require the removal of 0.12ha of native vegetation within 100m of a rock outcrop with crevices (Figure 16) that may provide breeding habitat for these species. These SAII species have not be surveyed for and as such have been assumed present. The proposed development will not result in any direct impacts to the rock outcrop as it is located outside of the Subject Land, and as such potential breeding habitat (i.e overhangs and crevices) will not be directly impacted. However, if this potential habitat is used by these species for breeding, there is potential that breeding individuals could be found foraging within the Subject

Serious and Irreversible Impact (SAII) Impact assessment provisions for threatened species or populations *Chalinolobus dwyeri* (Large-eared Pied Bat) *Vespadelus troughtoni* (Eastern Cave Bat).		
BC Act Status: Vulnerable		
		Land. A number of measures have been taken to avoid direct and indirect impacts on this species, such as minimising the amount of native vegetation proposed for direct removal.
b) the size of the local population directly and indirectly impacted by the development, clearing or biodiversity certification		These species have not been surveyed and only assumed present and therefore the local population size cannot be determined.
c) the extent to which the impact exceeds any threshold for the potential entity that is specified in the Guidance to assist a decision-maker to determine a serious and irreversible impact		The SAII threshold for these species is potential breeding habitat and the presence of breeding individuals. Potential breeding habitat is PCTs associated with the species within 100m of rocky areas containing caves, overhangs, crevices, cliffs or escarpments; or within 100m of old mines, tunnels, culverts or derelict concrete buildings (DPE 2024d). The Subject Land occurs within 100m of an rocky outcrop with crevices, which could provide potential breeding habitat for these species. Surveys have not been undertaken to ascertain whether breeding individuals are located within the Subject Land, or whether this species occupy the potential breeding habitat.
d) the likely impact (including direct and indirect impacts) that the development, clearing or biodiversity certification will have on the habitat of the local population, including but not limited to:	i) an estimate of the change in habitat available to the local population as a result of the proposed development	No breeding habitat (i.e. rocky outcrop) is to be directly impacted as a result of the proposed development, however 0.12ha of vegetation near potential breeding habitat will require clearing. This vegetation may be used by breeding individuals if the potential habitat nearby is utilised as a breeding site. It is not expected that other populations of these species will be impacted by the proposed development.
	ii) the proposed loss, modification, destruction or isolation of the available habitat used by the local population, and	No breeding habitat (i.e. rocky outcrop) is to be impacted as a result of the proposed development, however 0.12ha of vegetation near potential breeding habitat will require removal. This vegetation may be used by breeding individuals if the overhang with crevices is a breeding site. It is however unlikely that this area of impact will lead to isolation of the available habitat, considering extensive areas of habitat connectivity will continue to exist within the locality.

Serious and Irreversible Impact (SAII) Impact assessment provisions for threatened species or populations *Chalinolobus dwyeri* (Large-eared Pied Bat) *Vespadelus troughtoni* (Eastern Cave Bat).		
BC Act Status: Vulnerable		
	iii) modification of habitat required for the maintenance of processes important to the species' life cycle (such as in the case of a plant – pollination, seed set, seed dispersal, germination), genetic diversity and long-term evolutionary development.	No breeding habitat (i.e. rocky outcrop) is to be impacted as a result of the proposed development, however vegetation near potential breeding habitat will require removal. This vegetation may be used by breeding individuals if the rocky outcrop crevices is a breeding site. It is however not expected that the removal of vegetation within the Subject Land will impact of processes important to the species' life cycle, considering that breeding habitat will not be directly impacted, and extensive vegetation will remain in the broader locality.
e) the likely impact on the ecology of the local population. At a minimum, address the following:	(i) for fauna: – breeding – foraging – roosting, and – dispersal or movement pathways	The removal of vegetation within the Subject Land is not expected to impact on the breeding or roosting of these species, considering breeding and roosting habitat is not being removed. There is also not expected to be any impact to dispersal or movement pathways considering the vast areas of habitat connectivity within the locality. There may however be minor impacts to foraging individuals, as a small area of potential foraging habitat will be removed as a result of the proposed development.
f) a description of the extent to which the local population will become fragmented or isolated as a result of the proposed development		The removal of vegetation as a result of the proposed development is not expected to fragment or isolate a local population of these species, if the species are using the rocky outcrop as breeding habitat. A small area of native vegetation is proposed for removal; however, large areas of habitat connectivity exist within the locality. As such, habitat connectivity will still remain for any individuals/populations that may occupy the area.
g) the relationship of the local population to other population/populations of the species. This must include consideration of the interaction and importance of the local population to other population/populations for factors such as breeding, dispersal and genetic viability/diversity, and whether the local population is at the limit of the species' range		Large-eared Pied Bats have a patchy distribution throughout its range, which extends from Rockhampton in Queensland south to Bungonia in the NSW Southern Highlands (DPIE 2017a). Similarly, the Eastern Cave Bat has a broad and patchy distribution on both sides of the Great Dividing Range from Cape York to Kempsey, with records from the New England Tablelands and the upper north coast of NSW. The western limit appears to be the Warrumbungle Range,

Serious and Irreversible Impact (SAII) Impact assessment provisions for threatened species or populations *Chalinolobus dwyeri* (Large-eared Pied Bat) *Vespadelus troughtoni* (Eastern Cave Bat).	
BC Act Status: Vulnerable	
	and there is a single record from southern NSW, east of the ACT. Surveys have not been undertaken to ascertain whether breeding individuals are located within the Subject Land, or whether these species occupy the rocky outcrop. However, the proposed development is not expected to impact on the relationship of one local population to another given the small area of vegetation removal and suite of similar vegetation and breeding habitat within the locality.
h) the extent to which the proposed development will lead to an increase in threats and indirect impacts, including impacts from invasive flora and fauna, that may in turn lead to a decrease in the viability of the local population	It is highly unlikely the proposed development will lead to an increase in threats to these species, considering the expansive areas of habitat available within the locality. The proposed development has the potential to lead to an increase in indirect impacts, such as an increase in weeds and pest species. However, this is expected to be minimal, and as such will not impact on the viability of a local population.
i) an estimate of the area, or number of populations and size of populations that is in the reserve system in NSW, the IBRA region and the IBRA subregion	Within NSW, based on available records for these species, the largest concentration of populations appears to be in the sandstone escarpments of the Sydney basin and northwest slopes of NSW. Much of this habitat occurs within state reserves. Further survey is required throughout its known range to determine the size and distribution of existing populations (DPIE 2017a; 2017b).
j) the measure/s proposed to contribute to the recovery of the species in the IBRA subregion.	Insufficient information is available on the species' distribution and ecology to guide effective management. The following measure has been proposed (2017a; 2017b): ▪ Survey and investigation of threat dynamics. ▪ Collect ecological data on the habitat requirements of the species including radio tracking of the species at key locations. ▪ Collect ecological data on the habitat requirements of the species including radio tracking of the species at key location

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 two (2) ecosystem credits are required to offset the biodiversity impacts of the proposed development (**Table 19**).

Table 19. Ecosystem credits required to offset the proposed development.

PCT	BC Act Status	Zone	Total Area (ha)	Ecosystem Credits Required
PCT 3234: Hunter Coast Lowland Spotted Gum Moist Forest	Endangered Ecological Community	Zone 1: Moderate Condition (Remnant Canopy)	0.12	2
Total Ecosystem Credits				**2**

9.2 Offset Requirement for Species Credits

Two (2) species credit species that have been 'assumed present' will require offsetting through the retiring of biodiversity offset species credits under the BOS as a result of the proposed development (**Table 20**).

Table 20. Species credit species required to offset the proposed development.

Species	BC Act Status	Vegetation Zone	Total Area of Potential Habitat (ha)	Species Credits Required
Chalinolobus dwyeri Large-eared Pied Bat	Vulnerable	Zone 1: Moderate Condition (Remnant Canopy)	0. 12ha	3
Vespadelus troughtoni (Eastern Cave Bat)	Vulnerable	Zone 1: Moderate Condition (Remnant Canopy)	0. 12ha	3
Total Species Credits				**6**

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 chapter of the SEPP applies to LGAs that are listed in Schedule 2 'Local government areas' of the SEPP. The Northern Beaches LGA is included in Schedule 2, however, the development control provisions of Part 4.2, Clause 4.9 of the SEPP do not apply to the proposed development as the land does not have an area of at least 1 hectare (including adjoining land within the same ownership). As such, this chapter of the SEPP does not apply to the proposed development.

10.2 State Environmental Planning Policy (Resilience and Hazards) 2021 - Chapter 2 Coastal Management

State Environmental Planning Policy (Resilience and Hazards) 2021: Chapter 2 – Coastal Management applies to land within the coastal zone. The coastal zone means the area of land comprised of the following coastal management areas:

- The coastal wetlands and littoral rainforests area;
- The coastal vulnerability area;
- The coastal environment area; or
- The coastal use area.

As the Subject Land does occur within any of these listed areas, this chapter of the SEPP does apply.

10.3 Pittwater Local Environmental Plan (LEP) 2014

10.3.1 Biodiversity (Clause 7.6)

The Subject Land is located within land mapped as 'Biodiversity' on the Pittwater LEP Biodiversity Map. As such, clause 7.6 of the Pittwater LEP applied to the proposed development. The objective of this clause is to maintain terrestrial, riparian and aquatic biodiversity by:

- Protecting native fauna and flora;
- Protecting the ecological processes necessary for their continued existence; and
- Encouraging the conservation and recovery of native fauna and flora and their habitats.

Before determining a development application, the consent authority must consider:

- Whether the development is likely to have:
    - Any adverse impact on the condition, ecological value and significance of the fauna and flora on the land;
    - Any adverse impact on the importance of the vegetation on the land to the habitat and survival of native fauna;
    - Any potential to fragment, disturb or diminish the biodiversity structure, function and composition of the land; and
    - Any adverse impact on the habitat elements providing connectivity on the land;
- Any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.

Development consent must not be granted unless the consent authority is satisfied that:

- The development is designed, sited and will be managed to avoid any significant adverse environmental impact;
- If that impact cannot be reasonably avoided by adopting feasible alternatives—the development is designed, sited and will be managed to minimise that impact; or
- If that impact cannot be minimised—the development will be managed to mitigate that impact.

The proposed development has been purposefully designed to minimise impacts on biodiversity values as much as possible. In order to avoid and minimise potential impacts of the proposal 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 in relation to the proposed development. A significant number of remnant trees have been retained within the Subject Property with a large quantity of native species proposed to be planted under the associated Landscape Plan which will see a net gain in biodiversity across the Subject Property.

10.4 Pittwater Development Control Plan (DCP) 2003

10.4.1 Pittwater Spotted Gum Forest – Endangered Ecological Community (Part B4.7)

The Subject Land contains Pittwater and Wagstaffe Spotted Gum Forest in the Sydney Basin Bioregion (formerly Pittwater Spotted Gum Forest), an EEC. As the proposed development involves the clearing of this EEC, part B4.7 of the Pittwater DCP applies. The following controls apply to the proposed development:

- Development shall not have an adverse impact on Pittwater Spotted Gum Endangered Ecological Community;
- Development shall restore and/or regenerate Pittwater Spotted Gum Endangered Ecological Community and provide links between remnants;
- Development shall be in accordance with any Pittwater Spotted Gum Forest Recovery Plan;
- Development shall result in no significant onsite loss of canopy cover or a net loss in native canopy trees;
- Development shall retain and enhance habitat and wildlife corridors for locally native species, threatened species and endangered populations;
- Caretakers of domestic animals shall prevent them from entering wildlife habitat;
- Fencing shall allow the safe passage of native wildlife;
- Development shall ensure that at least 80% of any new planting incorporates native vegetation (as per species found on the site or listed in Pittwater Spotted Gum Endangered Ecological Community); and
- Development shall ensure any landscaping works are outside areas of existing Pittwater Spotted Gum Endangered Ecological Community and do not include Environmental Weeds.

Although the proposed development will have an impact on PWSGF, a series of mitigation and management measures have been identified in order to avoid, minimise and offset potential impacts of the proposal on PWSGF (Table 15).

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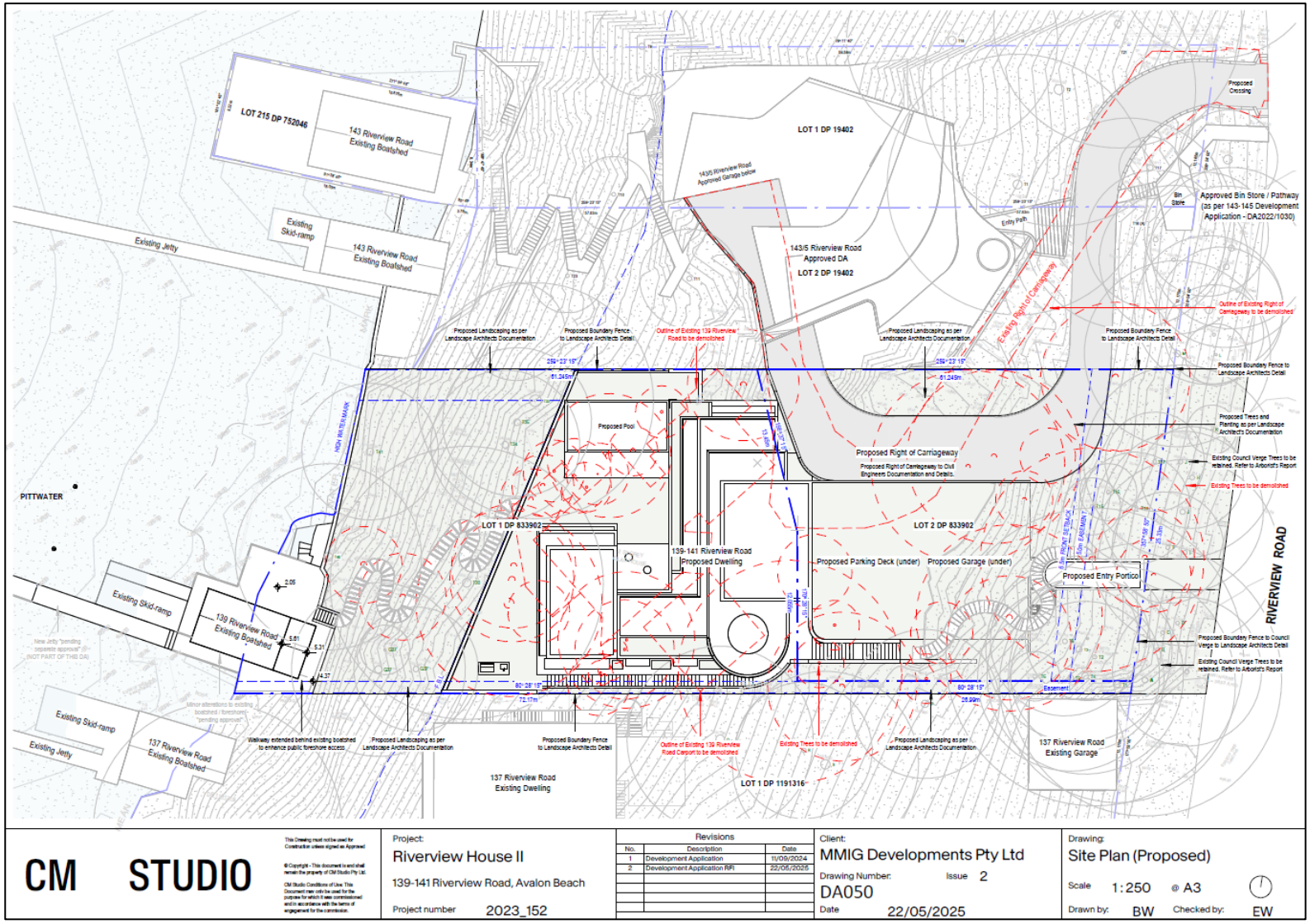
12. Appendices

Appendix A. Proposed Site Plan (CM Studio 2025)

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

Appendix C. BAMC Generated Biodiversity Credit Report.

Appendix A. Proposed Site Plan (CM Studio 2025).



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

BAM Site – Field Survey Form					
Date:	02.08.2024	**Plot ID:**	Plot 1	**Photo #:**	0
Zone:	56	**Plot Dimensions:**	50x20	**Easting:**	343843.7m E
Datum:	GDA94	**Middle bearing from 0m:**	351°	**Northing:**	6278552.81m N
PCT:	PCT 3234 - Moderate Condition (Remnant Canopy)				

Growth Form	Scientific Name	Cover	Abundance
HTE	*Acetosa sagittata*	1	5
Exotic	*Agave attenuata*	2	10
HTE	*Ageratina adenophora*	3	10
Tree (TG)	*Allocasuarina torulosa*	10	2
Exotic	*Alstroemeria psittacina*	10	50
HTE	*Asparagus aethiopicus*	7	20
HTE	*Bidens pilosa*	2	20
Tree (TG)	*Brachychiton acerifolius*	3	2
Exotic	*Callisia fragrans*	10	50
HTE	*Canna indica*	1	1
Other (OG)	*Cayratia clematidea*	1	3
Forb (FG)	*Centella asiatica*	1	20
HTE	*Chlorophytum comosum*	3	10
Exotic	*Clivia spp.*	2	7
Forb (FG)	*Commelina cyanea*	1	2
Exotic	*Conyza bonariensis*	1	2
Tree (TG)	*Corymbia maculata*	5	3
Exotic	*Cotoneaster spp.*	3	1
Exotic	*Ctenanthe Greystar*	7	30
Forb (FG)	*Desmodium rhytidophyllum*	1	1
Forb (FG)	*Dichondra repens*	1	10
Exotic	*Dietes grandiflora*	1	3
HTE	*Ehrharta erecta*	2	30
Exotic	*Erigeron karvinskianus*	1	1
Tree (TG)	*Eucalyptus paniculata*	3	1
Grass & grasslike (GG)	*Ficinia nodosa*	1	1
Other (OG)	*Glycine tabacina*	1	5
Shrub (SG)	*Grevillea spp.*	1	1
HTE	*Hedera helix*	3	30
Exotic	*Jacaranda mimosifolia*	20	6
Exotic	*Jasminum mesnyi*	3	20
Exotic	*Jasminum polyanthum*	15	5
HTE	*Lantana camara*	5	6
HTE	*Ligustrum lucidum*	10	10

Other (OG)	*Macrozamia communis*	3	5
Grass & grasslike (GG)	*Microlaena stipoides*	2	10
Exotic	*Monstera deliciosa*	3	15
Fern (EG)	*Nephrolepis cordifolia*	3	10
Exotic	*Nerium oleander*	3	4
HTE	*Ochna serrulata*	3	7
Grass & grasslike (GG)	*Oplismenus aemulus*	1	100
Other (OG)	*Livistona australis*	1	1
Other (OG)	*Passiflora herbertiana*	1	1
Exotic	*Phyllostachys spp.*	50	
Shrub (SG)	*Pittosporum undulatum*	2	3
HTE	*Schefflera actinophylla*	1	1
HTE	*Senna pendula*	1	1
Exotic	*Sida rhombifolia*	1	2
Exotic	*Solanum nigrum*	1	1
Exotic	*Taraxacum officinale*	1	2
HTE	*Tradescantia fluminensis*	3	50

DBH	# Tree Stems Count	# Hollow Bearing Trees
80+cm	-	0
50-79cm	-	0
30-49cm	2	0
20-29cm	4	0
10-19cm	6	0
5-9cm	1	0
<5cm	1	0

Length of Logs (m)	3

BAM Attribute (1x1m)	Litter Cover (%)
1 (5m)	10
2 (15m)	10
3 (25m)	40
4 (35m)	90
5 (45m)	70
Average	10

Growth Form	Composition Data (Count of Native Cover)	Structure Data (Sum of Cover)
Tree	4	21
Shrub	2	3
Grass	3	4
Forb	4	4
Fern	1	3
Other	5	7
High Threat Exotics	14	44

Appendix C. BAMC Generated Biodiversity Credit Report.

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id 00050415/BAAS21009/24/00050416	Proposal Name 139 - 141 Riverview Road Avalon Beach	BAM data last updated * 28/10/2024
Assessor Name Christopher Moore	Assessor Number BAAS21009	BAM Data version * Current classification (live - default) (80)
Proponent Names Mark Rowlands	Report Created 10/07/2025	BAM Case Status Finalised
Assessment Revision 1	BOS entry trigger BOS Threshold: Biodiversity Values Map	Assessment Type Part 4 Developments (Small Area)
Date Finalised 10/07/2025	* 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
Pittwater and Wagstaffe Spotted Gum Forest in the Sydney Basin Bioregion	Endangered Ecological Community	3234-Hunter Coast Lowland Spotted Gum Moist Forest

Species
Chalinolobus dwyeri / Large-eared Pied Bat

BAM Biodiversity Credit Report (Like for like)

Vespadelus troughtoni / Eastern Cave Bat

Additional Information for Approval

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
No Changes

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

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
3234-Hunter Coast Lowland Spotted Gum Moist Forest	Pittwater and Wagstaffe Spotted Gum Forest in the Sydney Basin Bioregion	0.1	0	2	2

BAM Biodiversity Credit Report (Like for like)

3234-Hunter Coast Lowland Spotted Gum Moist Forest	Like-for-like credit retirement options					
	Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
	Pittwater and Wagstaffe Spotted Gum Forest in the Sydney Basin Bioregion This includes PCT's: 3234, 3437	-	3234_ModerateCondition	No	2	Pittwater, 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
Chalinolobus dwyeri / Large-eared Pied Bat	**3234_ModerateCondition**	0.1	3.00
Vespadelus troughtoni / Eastern Cave Bat	**3234_ModerateCondition**	0.1	3.00

Credit Retirement Options

Like-for-like credit retirement options

Chalinolobus dwyeri / Large-eared Pied Bat	Spp	IBRA subregion
	Chalinolobus dwyeri / Large-eared Pied Bat	Any in NSW

NSW GOVERNMENT

BAM Biodiversity Credit Report (Like for like)

Vespadelus troughtoni / Eastern Cave Bat	Spp	IBRA subregion
	Vespadelus troughtoni / Eastern Cave Bat	Any in NSW

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