Biodiversity Development Assessment Report

113 Orchard Street, Warriewood

Prepared by Ecological Consultants Australia Pty Ltd TA Kingfisher Urban Ecology and Wetlands

February 2024

About this document

Limitations Statement

Information presented in this report is based on an objective study undertaken in response to the brief provided by the client. Any opinions expressed in this report are the professional, objective opinions of the authors and are not intended to advocate any particular proposal or pre-determined position.

Document Information	
Title:	Biodiversity Development Assessment Report 113 Orchard Street, Warriewood
Version 2:	For submission
Date:	9 February 2024
File location:	C: /ECA 4 Projects/2 Projects/2023-2024/Flora Fauna BAM BDAR/BDARs/113 Orchard St, Warriewood
Distribution:	Tony McLain Tony McLain Architects | E: mclaintony@gmail.com c/o Jill Hunter | E: j.hunter@unsw.edu.au

Signed: Elaway Geraldene Dalby-Ball – Director of Ecological Consultants Australia Pty Ltd

Document tracking

Version	Date	Document author(s)	Details	Issued to
1	5 February 2024	E. G. Dalby-Ball B. Thompson	For Certification	Tony McLain c/o Jill Hunter
2	9 February 2024	E. G. Dalby-Ball B. Thompson	For Submission	Tony McLain c/o Jill Hunter

BDAR Preparation

This BDAR has been prepared to satisfy the *Natural Environment Referral Response – Biodiversity* issued by the Northern Beaches Council on the 25th of September 2023 (Appendix F).

A Flora and Fauna Assessment (FFA) was prepared by Kingfisher Urban Ecology and Wetlands and submitted with the application which identified that the proposal does not trigger the Biodiversity Offset Scheme (BOS) as native vegetation clearing does not exceed the applicable threshold (0.5 ha or more).

As per advice from the Department of Planning and Environment (DPE) on the 19th of September 2023, future 10/50 clearing code entitlements must be included in the proposed development footprint when determining the application of the BOS. As such, this BDAR has been prepared to include all potential impacts to native vegetation including development footprint, future 10/50 clearing entitlement associated with the new dwelling, APZs and associated services and infrastructure.

The subject land is in a designated 10/50 vegetation entitlement clearing area; thus, 10/50 clearing code entitlements have been considered.

The 10/50 Vegetation Clearing Scheme gives people living near the bush an additional way of being better prepared for bushfires.

The scheme allows people in a designated area to:

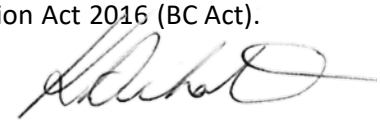
- Clear trees on their property within 10 metres of a home, without seeking approval; and
- Clear underlying vegetation such as shrubs (but not trees) on their property within 50 metres of a home, without seeking approval.

Additionally, this BDAR addresses whether the proposal complies with clause 7.6 of the Pittwater Local Environmental Plan (LEP) 2014 and clause B4.18 of the Pittwater 21 Development Control Plan (DCP) (section 1.5).

Declaration

i. Certification under clause 6.15 Biodiversity Conservation Act 2016

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

Signature: 

Date: 9 February 2024

BAM Assessor Accreditation no: BAAS17054

This BDAR has been prepared to meet the requirements of BAM 2020. Appendix G assesses compliance with the minimum information requirements outlined in BAM Appendix K.

Summary

Ecological Consultants Australia trading as Kingfisher Urban Ecology and Wetlands has been engaged by Tony McLain Architects c/o Jill Hunter to prepare a **Biodiversity Development Assessment Report** (BDAR) to accompany a development application for demolition works and construction of a dwelling house, horse arena, stables and paddocks at Lot 6 in DP 749791 known as 113 Orchard Street, Warriewood in the Northern Beaches local government area (LGA).

Legislative pathway for the proposed development or activity to be considered

- Development that requires consent under Part 4 of the EP&A Act.

Reason for entering the BOS

- Threshold for clearing (0.5 ha or more) exceeded, above which the BAM and offsets scheme apply.
- Clearing of native vegetation and other biodiversity impacts prescribed by clause 6.1 of the Biodiversity Regulation 2017 on land identified on the Biodiversity Values Map.

PCTs and TECs

Field surveys and collection of BAM plot data (Oct 2020, Feb 2023 and Dec 2023) from within the subject land's vegetation validated the presence of PCT 3176 – Sydney Enriched Sandstone Moist Forest. No TEC was recorded within the subject land.

Avoid and Minimise

- The proposal is entirely outside the Tree Protection Zones (TPZs) of 114 trees.
- Tree protection measures and tree sensitive construction methods outlined in the Arboricultural Impact Assessment & Tree Protection Specification (L&Co 07 April 2023) shall be implemented to minimise the likelihood of negative impacts on trees.
- All trees that are to be retained within the proposed horse paddocks shall have a permanent trunk protection installed in the form of wooden fencing to prevent mechanical damage from horse activities.
- The proposal retains Tree 113. This tree contains a hollow being occupied by a native glider. Bunting shall be used to fence off the tree during development to ensure that the tree is not disturbed.
- An ecologist shall be present during tree removal to supervise the clearance of trees and other habitat to capture, treat and/or relocate any displaced native fauna to an appropriate nearby location.
- Prior to the demolition of the existing dwelling, an ecologist shall undertake a pre-clearance survey to check the existing dwelling for any evidence of roosting microbats. Where roosting microbats are found, a suitability qualified and vaccinated person is to be engaged to relocate the species. For cave dwelling species, a temporary mock cave (e.g., shed) is to be installed on the subject land. The relocator is to encourage and move bats into the mock cave. When microbats leave the mock cave, the structure may be removed. For hollow dwelling species, microbats are to be relocated into next boxes and the boxes are to be installed in trees to be retained on the subject land.

Threatened Species

The Little Bent-winged Bat (*Miniopterus australis*) was recorded during microbat surveys using bat detectors (Anabat Swift, Titley Scientific) installed on the subject land in November 2022; however, this species has been discounted given the absence of breeding habitat on the subject land.

Direct Impacts

- The proposal requires the clearing of thirty-three native trees to facilitate the development in its current form.
- The proposal requires the permanent removal of 0.03 ha of native vegetation for the proposed structures, and the modification of 0.14 ha of native vegetation for the proposed horse arena, paddocks and APZ.
- Future 10/50 clearing entitlement associated with the new structures provide that 0.03 ha of all tree, shrubs and groundcovers within the 10 metre clearing entitlement area, and 0.32 ha of understorey within the 50 metre clearing entitlement areas may be cleared without seeking approval. These potential impacts have been included in the BAM calculations; however, these areas are proposed for retention and the proposal does not directly impact these areas.

Ecosystem Impacts

The clearing and modification of native vegetation on the subject land will be offset through the retirement of 1 ecosystem credit for PCT 3176.

Species Impacts

The removal of trees and other vegetation on the subject land is within a mapped important area for the Swift Parrot. The clearing of this important habitat will be offset through the retirement of 5 species credits.

Table E1 Impacts that require an offset – ecosystem credits

PCT ID	PCT Name	TEC	Impact area (ha)	Number of ecosystem credits required
3176	Sydney Enriched Sandstone Moist Forest	Not a TEC	0.81	1

Table E2 Impacts that require an offset – species credits

Common name	Scientific name	Loss of habitat (ha) or individuals	Number of species credits required
Swift Parrot	*Lathamus discolor*	0.81	5

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Acronyms and abbreviations

BAM	Biodiversity Assessment Method
BAM-C	Biodiversity Assessment Method Calculator
BAR	Biodiversity Assessment Report
BC Act	Biodiversity Conservation Act 2016 (NSW)
BCAR	Biodiversity Certification Assessment Report
BC Regulation	Biodiversity Conservation Regulation 2017 (NSW)
BCT	Biodiversity Conservation Trust
BDAR	Biodiversity Development Assessment Report
BSSAR	Biodiversity Stewardship Site Assessment Report
BOS	Biodiversity Offsets Scheme
CEEC	Critically endangered ecological community
DBH	Diameter at breast height over bark
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)
EP&A Act	Environmental Planning and Assessment Act 1979 (NSW)
EEC	Endangered ecological community
HTW	High threat weed
IBRA	Interim Biogeographic Regionalisation for Australia
LGA	Local government area
LLS Act	Local Land Services Act 2013 (NSW)
NPW Act	National Parks and Wildlife Act 1974 (NSW)
NSW	New South Wales
PCT	Plant community type
SAII	Serious and irreversible impact
TBDC	Threatened Biodiversity Data Collection
TEC	Threatened ecological community
Vegetation SEPP	State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017
VEC	Vulnerable ecological community

Stage 1: Biodiversity Assessment

1 Introduction

1.1 Background

Kingfisher Urban Ecology and Wetlands has been engaged by Tony McLain Architects c/o Jill Hunter to prepare a BDAR to accompany a development application for demolition works and construction of a dwelling house, horse arena, stables and paddocks at Lot 6 in DP 749791 known as 113 Orchard St, Warriewood in the Northern Beaches LGA.

The proposal triggers the area clearing and Biodiversity Values Map threshold.

The legislative pathway for the proposed development or activity to be considered is development that requires consent under Part 4 of the EP&A Act.

The site has been assessed in the BAM-C from which offset credits have been generated.

1.2 Subject Land

The subject land is a panhandle shaped parcel of land located at Lot 6 in DP 749791 known as 113 Orchard St, Warriewood NSW 2102 (Figure 1.1). The study area includes the subject land, as well as any additional land traversed during the site survey.

Table 1.1. Site Information.

Title Reference (Lot/DP)	Lot 6 DP 749791
Area (ha)	0.97
Address	113 Orchard St, Warriewood NSW 2102
LGA	Northern Beaches Council
Land Zoning	RU2 – Rural Landscape
Local Environmental Plan	Pittwater Local Environmental Plan 2014

Figure 1.1. Subject Land.

1.3 Proposal

The development application seeks consent for demolition works and construction of a dwelling house, horse arena, stables, paddocks (Figure 1.2) and landscaping (Figure 1.3).

Figure 1.2. Site Plan.
Source: Tony McLain Architect. Rev J. 11.05.2023.

Figure 1.3. Landscape Concept Plan.
Source: Tony McLain Architect. Rev J. 11.05.2023.

The Bushfire Risk Assessment report prepared by Bushfire Planning Services (Dated 13.04.2022) identified the estimated APZ required to achieve BAL-40 (Figure 1.4). The APZ area is 2934 m^2 (including the proposed dwelling).

Figure 1.4. APZ.

Source: Bushfire Risk Assessment. Bushfire Planning Services. 13.04.2022.

1.4 Information Sources

Databases reviewed in the assessment:

- BioNet Vegetation Classification
- BioNet Threatened Biodiversity Data Collection
- NSW BioNet Atlas
- Directory of Important Wetlands in Australia
- Biodiversity Values Map and Threshold tool
- BAM – Important Areas Viewer
- Protected Matters Search Tool
- NSW Planning Portal Spatial Viewer
- SEED
- eSPADE v2.2

Spatial data used in the assessment:

- NSW Imagery (DCS 2014)
- NSW Base Map (DCS 2015)
- NSW Cadastre Web Service (DCS 2016)
- NSW Hydrography (DCS 2016)
- Biodiversity Values Map Edition 16.2 (DPE 2023)
- IBRA Version 7 (Regions) (DCCEEW 2016)
- NSW (Mitchell) Landscapes Version 3.1 (DPE 2017)
- NSW State Vegetation Type Map Edition C1.1.M1.1 (DPE 2022)

Reports and plans related to the proposal:

- Survey Plan. Prepared by Axiom Surveying. Dated 22.02.2018.
- Site Plan Rev. J. Prepared by Tony McLain Architect. Dated 11.05.2023.
- Landscape Concept Plan. Rev. J. Prepared by Tony McLain Architect. Dated May 2023.
- Arboricultural Impact Assessment & Tree Protection Specification. Ver. 3. Prepared by Laurence & Co. Dated 07.04.2023.
- Flora and Fauna Report. Prepared by Kingfisher Urban Ecology and Wetlands. Dated March 2023.
- Bushfire Risk Assessment. Prepared by Bushfire Planning Services. Dated 13.04.2022.
- Natural Environment Referral Response – Biodiversity. DA2023/1127. From Northern Beaches Council. Dated 25/09/2023.

1.5 Pittwater LEP and DCP

1.5.1 Pittwater LEP 2014 cl. 7.6 Biodiversity Protection

7.6 Biodiversity

(1) The objective of this clause is to maintain terrestrial, riparian and aquatic biodiversity by—

(a) protecting native fauna and flora, and

(b) protecting the ecological processes necessary for their continued existence, and

(c) encouraging the conservation and recovery of native fauna and flora and their habitats.

(2) This clause applies to land identified as "Biodiversity" on the Biodiversity Map.

The subject land is identified as "Biodiversity" on the Biodiversity Map.

(3) Before determining a development application for development on land to which this clause applies, the consent authority must consider—

(a) whether the development is likely to have—

(i) any adverse impact on the condition, ecological value and significance of the fauna and flora on the land, and

The proposal is not expected to have a significant adverse impact on the condition, ecological value and significance of the flora and fauna on the land. The most significant habitats for flora and fauna are situated within the western portion of the subject land. The development footprint is located outside of this area.

(ii) any adverse impact on the importance of the vegetation on the land to the habitat and survival of native fauna, and

The proposal retains important habitats for the survival of native fauna. Tree 113 contains a hollow hosting a native glider. This tree will be retained and protected. The proposal retains all habitat trees except for 1 hollow-bearing tree located within the dwelling footprint. The clearing of this tree will be supervised by an ecologist to ensure no native fauna are harmed, and where native fauna are present the species will be relocated to an appropriate nearby location within the subject land or adjacent vegetation.

(iii) any potential to fragment, disturb or diminish the biodiversity structure, function and composition of the land, and

The proposal does not fragment any habitat on the subject land. The proposal will see the structure, function and composition of vegetation within the development footprint diminish; however, biodiversity values within the subject land will be retained within areas outside the direct development footprint. Trees will be retained within the development footprint and appropriate measures will be put in place to ensure their survival.

(iv) any adverse impact on the habitat elements providing connectivity on the land, and

See section 6.3.3 Movement corridors. The proposal is not expected to have any adverse impact on the habitat elements providing connectivity on the land. Connectivity of habitat on the subject land is to be retained post development.

(b) any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.

See section 6 Avoid and Minimise Impacts

(4) Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that—

(a) the development is designed, sited and will be managed to avoid any significant adverse environmental impact, or

(b) 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

(c) if that impact cannot be minimised—the development will be managed to mitigate that impact.

See section 6 Avoid and Minimise Impacts

1.5.2 Pittwater 21 DCP cl. B4.18 Heathland/Woodland Vegetation

Controls

- **Development shall retain and enhance habitat and wildlife corridors for threatened species, endangered populations, endangered ecological communities and other locally native species.**

The proposal retains habitat and wildlife corridors for threatened species, endangered populations, endangered ecological communities and other locally native species. These habitats and wildlife corridors shall be enhanced will the implementation of a Biodiversity Management Plan (BMP).

- **Development shall not reduce or degrade habitat for locally native species, threatened species, endangered populations or endangered ecological communities.**

The proposal will see the reduction in canopy cover on the subject land; however, the implementation of a Biodiversity Management Plan (BMP) and native species landscaping shall ensure no net loss of habitat for locally native species, threatened species, endangered populations or endangered ecological communities.

- **Wastewater shall receive tertiary treatment and not be discharged directly into heathland.**

The subject land does not contain heathland.

- **Compliance with Council's Water Management for Development Policy is required.**

Compliant.

- **Caretakers of domestic animals shall prevent them from entering wildlife habitat areas.**

Compliant.

- **Fencing, where permitted, shall allow the safe passage of native wildlife.**

Compliant.

- **Development shall not negatively impact on heathland.**

The subject land does not contain heathland.

- **Development shall ensure long-term sustainability of wetlands and must include an appropriate buffer - minimum of 10 metres from wetland edge.**

The subject land does not contain any wetlands, nor does it occur 10 metres from a wetland edge.

- **Development shall ensure that at least 80% of any new planting incorporates native vegetation (as per species found on the site or listed in Native Plants for Your Garden available on the Pittwater Council website).**

The Plant Schedule shall include at least 80% native species characteristic of the Sydney Enriched Sandstone Moist Forest community.

- **Landscaping works are to be outside areas of bushland and do not include environmental weeds.**

Landscaping works are proposed for the development footprint only. The Plant Schedule does not include environmental weeds.

1.6 Biodiversity Offsets Scheme

The Biodiversity Offsets Scheme (BOS) applies to local development (assessed under Part 4 of the EP&A Act) that is likely to significantly affect threatened species. Local development is likely to significantly affect threatened species and require a BDAR (section 7.7 of the BC Act) if impacts either:

- exceed the Biodiversity Offsets Scheme threshold (BC Act, section 7.4); the threshold includes clearing on land within the Biodiversity Values Map or clearing of an area that exceeds the threshold
- are carried out on an Area of Outstanding Biodiversity Value (AOBV)
- are likely to significantly affect threatened species, ecological communities and their habitats according to the test in section 7.3 of the BC Act

The BOS threshold test

The BC Regulation sets out the threshold level for when the BOS will be triggered. The threshold has 2 elements:

- whether the amount of native vegetation being cleared exceeds an **area threshold**
- whether the impacts occur on an area mapped on the **Biodiversity Values Map** published by the Environment Agency Head

If clearing and other impacts, including biodiversity impacts prescribed by clause 6.1 of the Biodiversity Regulation 2017, exceed either trigger, the BOS applies to the proposal.

1.6.1 Area threshold

The area threshold varies depending on the minimum lot size (shown in the Lot Size Maps made under the relevant Local Environmental Plan [LEP]), or actual lot size (where there is no minimum lot size provided for the relevant land under the LEP (Figure 1.5).

The minimum lot size associated with the property under the Pittwater LEP is 1 ha and therefore, the threshold for clearing, above which the BAM and offsets scheme apply is 0.5 ha or more.

The proposal will clear and/or modify 0.5 ha or more of native vegetation and therefore, the area clearing threshold is triggered.

Minimum lot size associated with the property	Threshold for clearing, above which the BAM and offsets scheme apply
Less than 1 ha	0.25 ha or more
1 ha to less than 40 ha	0.5 ha or more
40 ha to less than 1000 ha	1 ha or more
1000 ha or more	2 ha or more

Figure 1.5. Area Clearing Thresholds.

1.6.2 Biodiversity Values Map

The Biodiversity Values Map identifies land of high biodiversity value, as defined by clause 7.3(3) of the Biodiversity Conservation Regulation 2017. The Biodiversity Offsets Scheme applies to the clearing of native vegetation and other biodiversity impacts prescribed by clause 6.1 of the Biodiversity Regulation 2017 on land identified on the Biodiversity Values Map.

The site is located on the Biodiversity Values Map (Figure 1.6). The proposal requires the clearing of native vegetation on land identified on the Biodiversity Values Map. It is noted that biodiversity values on the subject land have been added in the last 90 days.

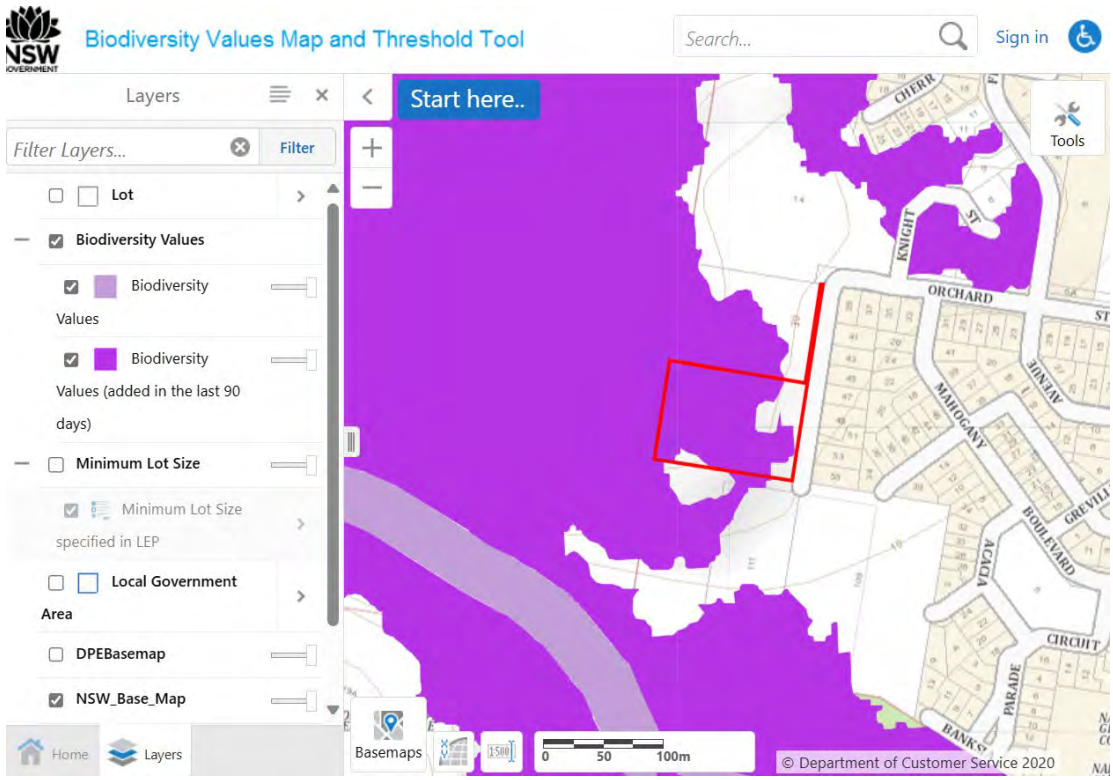

Figure 1.6. Biodiversity Values Map.
Source: Biodiversity Values Map and Threshold tool. Date accessed: 6/12/2023.

1.7 Application of the BAM

The proposal has been assessed under the Streamlined assessment module – Small area (Appendix C of the BAM 2020), which may be used for small area developments in accordance with the area clearing threshold shown in Table 12 of the BAM 2020 (which in this case is a lot size less than 40 ha but not less than 1 ha and clearing of ≤2 ha), and where the biodiversity values of land that is located within an area on the Biodiversity Values Map. The assessment type used in the BAM-C is Part 4 Developments (Small Area).

2 Site Context

2.1 Assessment Area

The assessment area includes the subject land and the area of land within the 1500 metre buffer zone surrounding the subject land.

2.2 Landscape Features

Landscape features identified within the subject land and assessment area are shown on Figure 2.1 and Figure 2.2, respectively. A discussion of relevant landscape features is provided below in Table 2.1.

Table 2.1. Landscape Features.

IBRA bioregion	Sydney Basin
IBRA subregion	Pittwater
NSW (Mitchell) landscape	Sydney – Newcastle Barriers and Beaches
Rivers, streams and estuaries	No rivers, streams or estuaries have been identified on the subject land. The closest waterway is Mullet Creek located approximately 160 metres southwest of the subject land. Mullet Creek flows southeast to enter Narrabeen Lagoon.
Wetlands	No wetlands have been identified on the subject land. Narrabeen Lagoon is located southeast of the subject land.
Habitat connectivity	The subject land's vegetation forms part of a significant vegetated link which connects Ku-ring-gai and Garigal National Parks with the Irrawong Reserve, Warriewood Wetlands and Narrabeen Lagoon.
Geological features	No karsts, caves, crevices, cliffs or areas of geological significance have been identified within the assessment area.
Areas of outstanding biodiversity values	No areas of outstanding biodiversity value have been identified within the assessment area.

2.3 Native Vegetation Cover

Native vegetation cover on the subject land has been assessed in relation to native vegetation cover across a broader area. Native vegetation cover within the assessment area was determined as follows:

- Clipping the extent of NSW State Vegetation Type Map (DPE 2022) within the assessment area using QGIS v3.28.10.
- Manually adding areas of native vegetation cover to the NSW State Vegetation Type Map shapefile not identified on the map.

Table 2.2 summarises the extent of native vegetation cover within the assessment area. Figure 2.2 Location Map shows native vegetation cover within the assessment area.

Table 2.2. Native Vegetation Cover.

Assessment area (ha)	774.41
Total area of native vegetation cover (ha)	238.26
Percentage of native vegetation cover (%)	30%
Class (0-10, >10-30, >30-70 or >70%)	>30-70

Figure 2.1. Site Map.

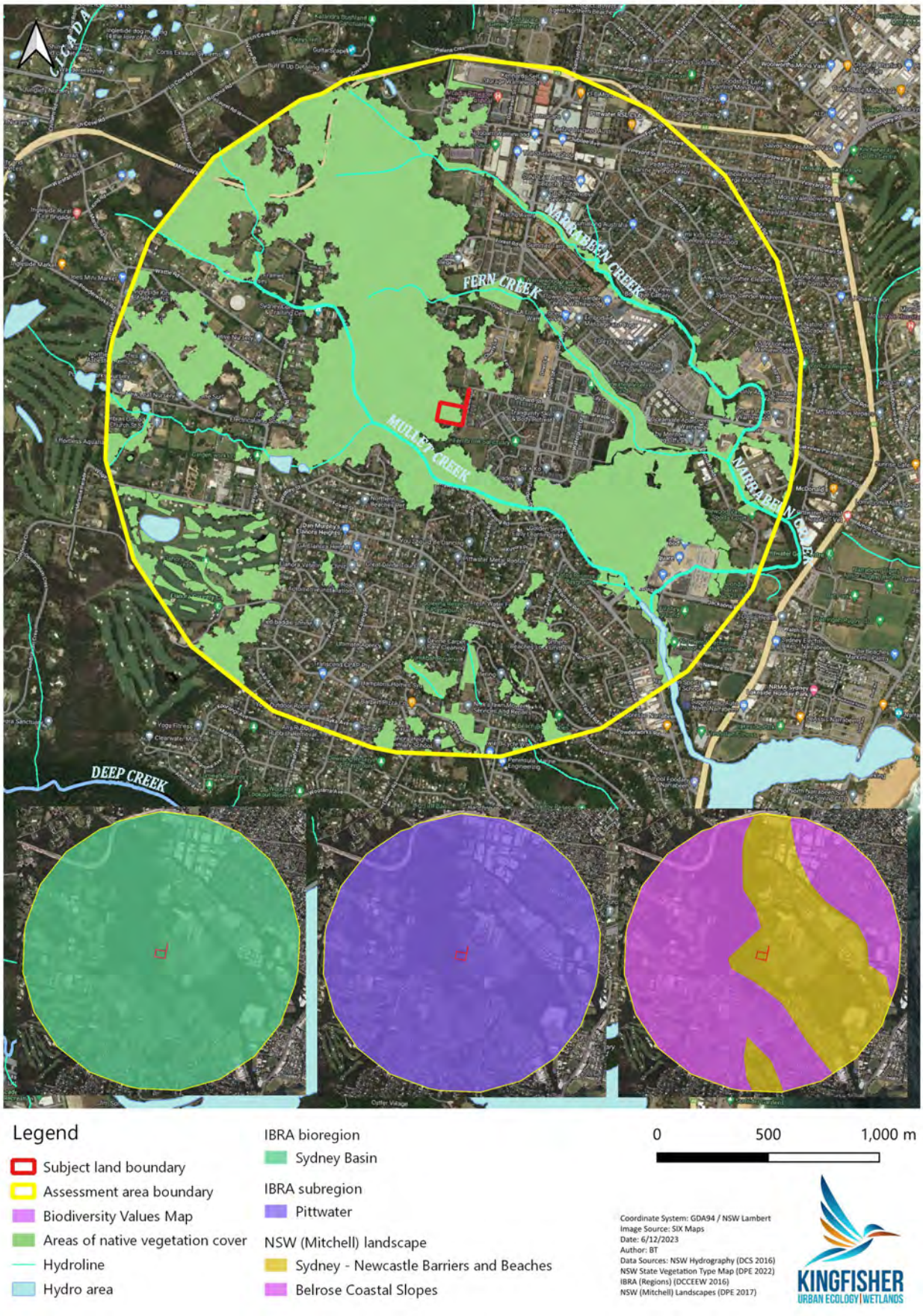

Figure 2.2. Location Map.

3 Native Vegetation, Threatened Ecological Communities and Vegetation Integrity

3.1 Native Vegetation Extent

3.1.1 Changes to the mapped native vegetation extent

A review of the SydneyMetroArea_v3_1_2016_E_4489 (OEH 2016) was initially undertaken and used to predict what Plant Community Type (PCT) might occur on the subject land. Figure 3.1 shows the PCTs mapped on the subject land via SydneyMetroArea_v3_1_2016_E_4489 (OEH 2016). Table 3.1 identifies the PCTs.

Table 3.1. PCTs mapped on the subject land via SydneyMetroArea_v3_1_2016_E_4489 (OEH 2016).

PCT ID	PCT Name	PCT Scientific Name	PCT Percent Cleared
1841	Coastal enriched sandstone moist forest	Smooth-barked Apple - Turpentine - Blackbutt tall open forest on enriched sandstone slopes and gullies of the Sydney region	67.00
1250	Coastal sandstone gully forest	Sydney Peppermint - Smooth-barked Apple - Red Bloodwood shrubby open forest on slopes of moist sandstone gullies, eastern Sydney Basin Bioregion	30.00

Since initial investigations were completed for the proposal, the NSW State Vegetation Type Map (SVTM) (DPE 2022) became available. The release of SVTM coincided with an ecological systematic review of PCTs in eastern NSW. This resulted in PCT 1250 changing to PCT 3595 (Sydney Coastal Sandstone Gully Forest) and the area formally mapped as PCT 1841 changing to PCT 3136 (Blue Gum High Forest) (Figure 3.2).

It is anticipated that the change of PCT 1841 to PCT 3136 in this area is an error in the ecological systematic review. Legacy PCT 1841 has the strongest association with new PCT 3176 (Sydney Enriched Sandstone Moist Forest) (BioNet Vegetation Classification database), with areas formally identified as PCT 1841 changing to PCT 3176 (in most cases). Additionally, vegetation within the subject land is not indicative of Blue Gum High Forest. Vegetation surveys and collection of BAM plot data from within the subject land's vegetation validated the presence of PCT 3176. Figure 3.3 shows the extent of PCT 3176 within the subject land, being measured at approximately 0.8 ha in extent.

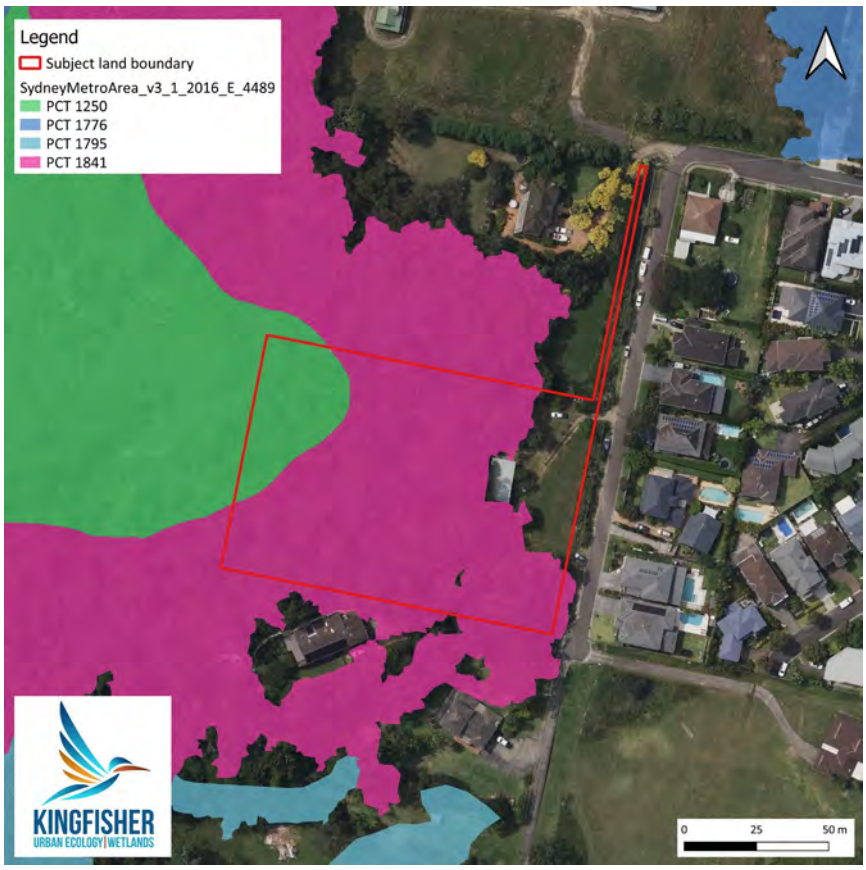

Figure 3.1. PCTs mapped on the subject land via SydneyMetroArea_v3_1_2016_E_4489 (OEH 2016).

Figure 3.2. PCTs mapped within the subject land via NSW State Vegetation Type Map (DPE 2022).

Figure 3.3. Field validated native vegetation extent within the subject land.

Vegetation within the subject land is indicative of PCT 3176 (refer to section 3.2). The extent of PCT 3176 was validated on the 15th of December 2023 by Principal Ecologist Geraldene Dalby-Ball and Senior Ecologist Brooke Thompson.

3.1.2 Areas that are not native vegetation

A parallel field traverse survey was conducted within the front lawn to determine the percent cover of native species. The survey involved searching along a grid of parallel transects set 5 metres apart.

The native groundcover within this area was concluded to be less than 10% (most areas being less than 1% or 0%). Along the driveway are planted natives in the form of *Callistemon viminalis* (Weeping bottlebrush), however these trees do not increase the native species cover within this area over 15%, nor is the species characteristic of PCT 3176.

The subject land contains less than 15% native cover within the front lawn.

Photos of the front lawn have been included below. Photos were taken during the 15th of December 2023 site survey.








3.2 Plant Community Type

Field surveys and collection of BAM plot data (Oct 2020, Feb 2023 and Dec 2023) from within the subject land's vegetation validated the presence of PCT 3176 as described in the BioNet Vegetation Classification database.

This PCT is a wet sclerophyll forest community occupying the western portion of the subject land. This PCT was not mapped by the SVTM (DPE 2022) but the closely related PCT, PCT 1841 – Coastal enriched sandstone moist forest, was mapped by OEH (2016).

Table 3.1 outlines the attributes and features used to justify the allocation of PCT 3176 to the native vegetation within the subject land.

Table 3.2. PCT 3176 allocation.

PCT ID	3176
PCT Name	Sydney Enriched Sandstone Moist Forest
IBRA Bioregion	Sydney Basin
IBRA Subregion	Pittwater
Vegetation Formation	Wet Sclerophyll Forests (Shrubby sub-formation)
Vegetation Class	North Coast Wet Sclerophyll Forests

Extent within the subject land (ha)	0.8
Location	The distribution of this forest is widespread though patchy across the Sydney area. Typically, it is situated in sandstone gullies and sheltered slopes enriched by clay material. This material is sourced from shale bands in the sandstone bedrock associated with Narrabeen sandstone on the Pittwater escarpment or Hawkesbury sandstone in the Lane Cove River valley. At other places the material is sourced from shale caps situated on ridgelines above the creek. Outcropping rocks and benches are common.
Elevation	The PCT occurs at elevations between 10 and 120 metres above sea level. The subject land occurs at elevations between 20 and 50 metres above sea level.
Constituent species present in the subject land	Trees *Angophora costata* (Sydney red gum), *Syncarpia glomulifera* (Turpentine), *Allocasuarina torulosa* (Forest oak), *Glochidion ferdinandi* (Cheese tree), *Eucalyptus piperita* (Sydney peppermint), *Allocasuarina littoralis* (Black she oak), *Corymbia gummifera* (Red bloodwood), *Eucalyptus resinifera* (Red mahogany), *Angophora floribunda* (Rough barked apple), *Banksia integrifolia* (Coast banksia), *Banksia serrata* (Old man banksia), *Eucalyptus robusta* (Swamp mahogany) Shrubs *Elaeocarpus reticulatus, Breynia oblongifolia, Hibbertia aspera* Grasses *Lomandra longifolia, Entolasia stricta, Microlaena stipoides, Entolasia marginata, Lomandra filiformis, Imperata cylindrica, Oplismenus aemulus, Lomandra obliqua, Themeda australis, Echinopogon caespitosus* Forbs *Dianella caerulea, Xanthosia pilosa, Commelina cyanea, Pomax umbellata, Centella asiatica, Poranthera microphylla* Ferns *Pteridium esculentum, Adiantum aethiopicum, Asplenium flabellifolium* Other *Livistona australis, Calochlaena dubia, Eustrephus latifolius, Hibbertia dentata, Stephania japonica, Cayratia clematidea, Hibbertia scandens, Glycine clandestina, Xanthorrhoea arborea*

3.3 Alignment with TECs

PCT 3176 is identified as part of the Hygrocybeae Community of Lane Cove Bushland Park in the Sydney Basin Bioregion Critically Endangered Ecological Community (CEEC) listed under the BC Act (BioNet Vegetation Classification database).

The CEEC is not present on the subject land. Lane Cove Bushland Park is located 25 km southwest of the subject land. No macro fungi characteristic of the community was recorded on the subject land.

3.4 Vegetation Survey Plots

Vegetation integrity survey plots were conducted as per the BAM 2020 (BAM section 4.2.1, Box 1) around a central 50 m midline with a 400 m^2 plot (standard 20 m x 20 m) for assessing structure and composition inside a 1000 m^2 plot (standard 20 m x 50 m) for assessing function. A total of four plots were sampled (Figure 3.4). Photos of each plot have been included below.

Plot 1. Indicative of the proposed stables and paddocks area.

Looking west into the subject land. The diversity of native groundcover* was high in the 400m^2 plot and low further west into the subject land (where leaf litter cover was > 80%). Native species diversity was high in the 400m^2 plot, though abundance was low.

*Referring to species within Growth Forms: Grass & grass-like, Forbs, Ferns and Other

Looking east downhill toward Orchard Street. Top of plot where litter cover was > 80%.

Plot 2. Indicative of the APZ area.

APZ establishment and maintenance on the property does not require the clearing of trees or shrubs. Tree and shrub cover is less than 10% within the APZ, therefore meeting the requirements of an APZ Inner Protection Area (IPA) as per Appendix 4, Planning for Bushfire Protection (NSW RFS 2019) (Appendix E).

Grasses are to be mown to less than 100mm in height to meet the requirements of the APZ IPA. No grasses are to be removed. Majority of the groundcover species within the subject land are less than 100mm in height. The species greater than 100mm in height included *Lomandra longifolia* (Spiny-headed Mat-rush) which is not considered to be a bushfire risk species (this species does not need to be mown).

Leaf litter and woody debris will be removed from the APZ to satisfy the requirements of the APZ IPA. Woody debris will be relocated to the bushland within the western portion of the subject land. Leaf litter will not be relocated as to not increase fuel loads to the west. Leaf litter will be removed via green waste.

Leaf litter has been reduced in the BAM-C to 0 for APZ management zone. Lengths of logs has been retained within the APZ management zone to reflect the retention of logs within the subject land (habitat logs will be moved out of the APZ and retained within the bushland within the western portion of the subject land).

Looking from 30 m (edge of the property) to 0 m on the 50 m midline. Hollow-bearing (cavity bearing) tree pictured is being retained. Leaf litter in this area > 80%.

Plot 3. Indicative of the unaffected area.

Western portion of the subject land consisted of large sandstone boulders. Any woody debris that is removed from APZ will be relocated here, allowing for the retention of habitat features within the subject land for native fauna. The proposal does not cause any impacts to this area. This area will be retained and protected with the implementation of a Biodiversity Management Plan (BMP).

Plot 4. Indicative of the proposed dwelling house area.

Looking toward Orchard Street. The proposed dwelling is to be situated to the northwest of the existing dwelling. Total tree, shrub and ground cover removal required for the proposed dwelling house (proposed dwelling house is approximately 0.02 ha in size).

3.5 Vegetation Zones

3.5.1 Vegetation Zones

Under the BAM 2020 (BAM Section 4.3.1) the assessor must delineate areas of each PCT that are in different broad condition states into separate vegetation zones. Disturbance to growth form groups for tree, shrub and ground cover or extent of exotics (or combinations of these) can be used to identify areas of similar condition.

The native vegetation community (PCT 3176) recorded on the subject land was delineated into three vegetation zones, being split into low and moderate condition states based on vegetation integrity (section 3.6). The distribution and extent of vegetation zones within the subject land is displayed in Figure 3.4.

Vegetation Zone 1 is situated within the southeastern corner of the subject land. This zone displays a high diversity of native groundcover species.

Vegetation Zone 2 is situated within the western portion of the subject land. This zone occurs over sandstone boulders and displays a high abundance of *Xanthorrhoea arborea* (Grass tree).

Vegetation Zone 3 is situated within the centre of the subject land. This zone displays a high coverage of leaf litter compared to zones 1 and 2. Groundcover species were less abundant although diversity remained relatively consistent across the zones.

3.5.2 Management Zones

Figure 3.5 shows how vegetation zones have been split into management zones for the BAM-C. Management zones includes new structures (hard surfaces), development footprint (porous surfaces), APZ, 10/50 clearing entitlement areas and areas of no impact.

Figure 3.4. Vegetation Zones, Patch Size and Plot Locations.

Figure 3.5. Management Zones.

3.6 Vegetation Integrity

Table 3.3 identifies the vegetation zones and current vegetation integrity scores. Table 3.4 identifies the management zones and future vegetation integrity scores.

Table 3.3. Vegetation zones (Current vegetation integrity scores).

Plot ID	PCT Code	Vegetation Zone	Patch Size (ha)	Area (ha)	Composition Score	Structure Score	Function Score	Current Vegetation Integrity Score
1	3176	1	>100	0.14	44	8.9	39.7	24.9
3	3176	2	>100	0.26	30	1.7	39.9	12.6
2, 4	3176	3	>100	0.41	47.7	1.2	30	11.9

Table 3.4. Vegetation zones (Future vegetation integrity scores).

Vegetation Zone / Condition	Management Zone	Area (ha)	Composition Score	Structure Score	Function Score	Future VI score	Change in VI score	Total VI loss
1 / Moderate	Structures	0.01	0	0	0	0	-24.9	-20
	Footprint	0.08	1.8	0.7	11.4	2.4	-22.5	
	APZ	0.01	44	8	23.9	20.3	-4.6	
	10	0.01	0	0	0	0	-24.9	
	50	0.03	7.9	4.7	24.7	9.7	-15.2	
2 / Low (Boulders)	APZ	0.01	30	1.7	24.9	10.8	-1.8	-3.6
	50	0.16	11.3	1.2	24.9	7	-5.7	
	No Impact	0.09	30	1.7	39.2	12.6	0	
3 / Low	Structures	0.02	0	0	0	0	-11.9	-7.3
	Footprint	0.11	7.9	0.2	11.4	2.5	-9.5	
	APZ	0.12	31.5	0.9	11.4	6.8	-5.1	
	10	0.02	0	0	0	0	-11.9	
	50	0.13	15.3	0.7	15	5.5	-6.5	
	No Impact	0.01	47.7	1.2	30	11.9	0	

4 Threatened Species

4.1 BioNet Records

4.1.1 Flora

BioNet records from within a 10 km radius of the subject land returned a total of 15 threatened flora species records. Table 4.1 lists the threatened flora recorded and their listing status under NSW and/or Commonwealth legislation. No records of threatened flora occur on or within 500 m of the subject land.

Table 4.1. Threatened flora records within 10 km of the subject land.

Family	Scientific Name	Common Name	NSW status	Comm. status	Records
Elaeocarpaceae	*Tetratheca glandulosa*		V		8
Ericaceae	*Epacris purpurascens var. purpurascens*		V		1
Euphorbiaceae	*Chamaesyce psammogeton*	Sand Spurge	E		7
Grammitidaceae	*Grammitis stenophylla*	Narrow-leaf Finger Fern	E		1
Malvaceae	*Lasiopetalum joyceae*		V	V	1
Myrtaceae	*Callistemon linearifolius*	Netted Bottle Brush	V		1
Myrtaceae	*Eucalyptus camfieldii*	Camfield's Stringybark	V	V	41
Myrtaceae	*Melaleuca deanei*	Deane's Paperbark	V	V	1
Myrtaceae	*Rhodamnia rubescens*	Scrub Turpentine	CE	CE	17
Myrtaceae	*Syzygium paniculatum*	Magenta Lilly Pilly	E	V	12
Orchidaceae	*Genoplesium baueri*	Bauer's Midge Orchid	E	E	1
Orchidaceae	*Microtis angusii*	Angus's Onion Orchid	E	E	157
Proteaceae	*Grevillea caleyi*	Caley's Grevillea	CE	CE	126
Proteaceae	*Macadamia integrifolia*	Macadamia Nut		V	4
Thymelaeaceae	*Pimelea curviflora var. curviflora*		V	V	5

CE = Critically Endangered, E = Endangered, V = Vulnerable

4.1.2 Fauna

BioNet records from within a 10 km radius of the subject land returned a total of 44 threatened fauna species records. Table 4.2 lists the threatened fauna recorded and their listing status under NSW and/or Commonwealth legislation. No records of threatened fauna occurred on the subject land. Table 4.2 highlights threatened fauna records from within a 1 km radius of the subject land bold.

Table 4.2. Threatened fauna records within 10 km of the subject land.

Class	Scientific Name	Common Name	NSW status	Comm. status	Records
Amphibia	***Pseudophryne australis***	**Red-crowned Toadlet**	**V**		**123**
Amphibia	***Heleioporus australiacus***	**Giant Burrowing Frog**	**V**	**V**	**26**
Reptilia	*Caretta caretta*	Loggerhead Turtle	E	E	5
Reptilia	*Chelonia mydas*	Green Turtle	V	V	3
Reptilia	*Dermochelys coriacea*	Leatherback Turtle	E	E	3
Reptilia	***Varanus rosenbergi***	**Rosenberg's Goanna**	**V**		**25**
Aves	*Stictonetta naevosa*	Freckled Duck	V		1
Aves	*Ptilinopus regina*	Rose-crowned Fruit-Dove	V		2
Aves	*Ptilinopus superbus*	Superb Fruit-Dove	V		3
Aves	*Hirundapus caudacutus*	White-throated Needletail		V	3
Aves	*Macronectes halli*	Northern Giant-Petrel	V	V	1
Aves	***Ixobrychus flavicollis***	**Black Bittern**	**V**		**7**
Aves	***Haliaeetus leucogaster***	**White-bellied Sea-Eagle**	**V**		**17**
Aves	***Hieraaetus morphnoides***	**Little Eagle**	**V**		**3**
Aves	*Lophoictinia isura*	Square-tailed Kite	V		4
Aves	*Pandion cristatus*	Eastern Osprey	V		24
Aves	*Onychoprion fuscata*	Sooty Tern	V		2
Aves	*Callocephalon fimbriatum*	Gang-gang Cockatoo	V	E	1
Aves	*Calyptorhynchus lathami lathami*	South-eastern Glossy Black-Cockatoo	V	V	51
Aves	*Glossopsitta pusilla*	Little Lorikeet	V		6
Aves	***Lathamus discolor***	**Swift Parrot**	**E**	**CE**	**15**
Aves	***Ninox connivens***	**Barking Owl**	**V**		**11**
Aves	***Ninox strenua***	**Powerful Owl**	**V**		**375**
Aves	*Tyto novaehollandiae*	Masked Owl	V		1
Aves	*Anthochaera phrygia*	Regent Honeyeater	CE	CE	33

Class	Scientific Name	Common Name	NSW status	Comm. status	Records
Aves	*Melithreptus gularis gularis*	Black-chinned Honeyeater (eastern subspecies)	V		1
Aves	***Petroica boodang***	**Scarlet Robin**	**V**		**2**
Mammalia	*Dasyurus maculatus*	Spotted-tailed Quoll	V	E	5
Mammalia	*Isoodon obesulus obesulus*	Southern Brown Bandicoot (eastern)	E	E	8
Mammalia	*Phascolarctos cinereus*	Koala	E	E	3
Mammalia	***Cercartetus nanus***	**Eastern Pygmy-possum**	**V**		**389**
Mammalia	*Petaurus norfolcensis*	Squirrel Glider	V		2
Mammalia	***Pteropus poliocephalus***	**Grey-headed Flying-fox**	**V**	**V**	**130**
Mammalia	*Saccolaimus flaviventris*	Yellow-bellied Sheathtail-bat	V		5
Mammalia	***Micronomus norfolkensis***	**Eastern Coastal Free-tailed Bat**	**V**		**18**
Mammalia	*Chalinolobus dwyeri*	Large-eared Pied Bat	V	V	9
Mammalia	*Falsistrellus tasmaniensis*	Eastern False Pipistrelle	V		1
Mammalia	***Myotis macropus***	**Southern Myotis**	**V**		**36**
Mammalia	*Scoteanax rueppellii*	Greater Broad-nosed Bat	V		6
Mammalia	*Vespadelus troughtoni*	Eastern Cave Bat	V		2
Mammalia	***Miniopterus australis***	**Little Bent-winged Bat**	**V**		**36**
Mammalia	***Miniopterus orianae oceanensis***	**Large Bent-winged Bat**	**V**		**57**
Mammalia	*Pseudomys novaehollandiae*	New Holland Mouse		V	1
Mammalia	Arctocephalus forsteri	New Zealand Fur-seal	V		7

CE = Critically Endangered, E = Endangered, V = Vulnerable

4.1.3 Endangered populations

No endangered populations have been recorded within a 10 km radius of the subject land.

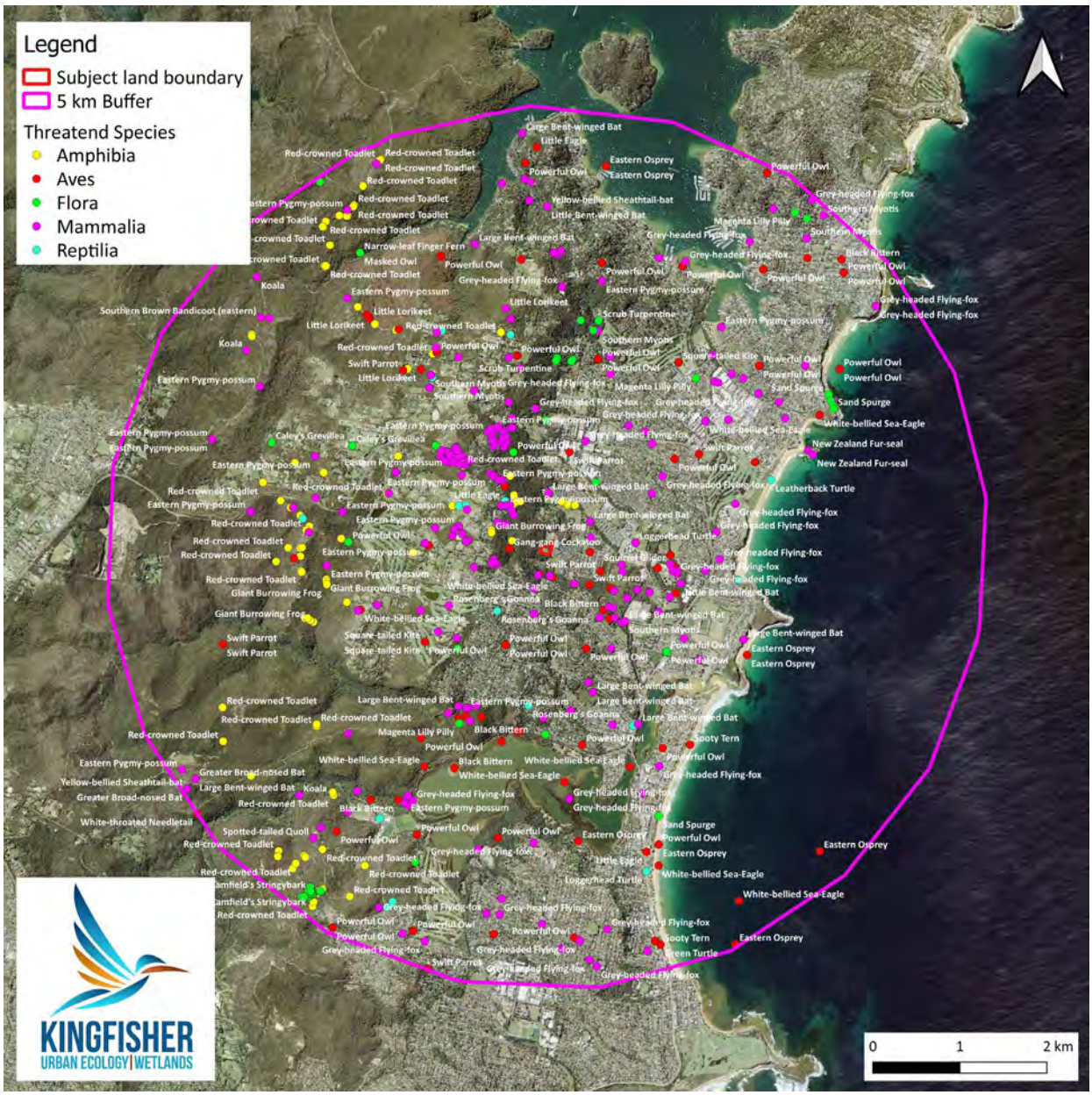

Figure 4.1. BioNet threatened species records from within a 5 km radius of the subject land.

4.2 Habitat Suitability for Threatened Species

4.2.1 Predicted ecosystem credit species

Ecosystem credit species are threatened species whose likelihood of occurrence can generally be predicted by vegetation surrogates and/or landscape features, or that have a low probability of detection using targeted surveys. A targeted survey is not required to identify or confirm the presence of ecosystem credit species.

A list of predicted ecosystem credit species automatically populated in the BAM-C for the subject land is included in Appendix II. All predicted ecosystem credit species have been maintained in the BAM-C.

4.2.2 Candidate species credit species

Species credit species are threatened species for which vegetation surrogates and/or landscape features cannot reliably predict the likelihood of their occurrence or components of their habitat. A targeted survey or an expert report is required to confirm the presence of these species on the subject land.

Table 4.3 lists candidate species credit species automatically generated by the BAM-C and whether they have been retained or excluded from further assessment based on geographic limitations and/or habitat constraints.

Table 4.3. Candidate threatened species (species credits species) generated by the BAM-C.

Species Name and Survey Requirements	Habitat Requirements	Justification for Exclusion	Assumed Present (Y/N)	Targeted Survey Required (Y/N)
Lathamus discolor Swift Parrot	Important Habitat mapping on subject land	N/A	**Y**	N
Chalinolobus dwyeri Large-eared Pied Bat	Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (*Petrochelidon ariel*), frequenting low to mid-elevation dry open forest and woodland close to these features. Females have been recorded raising young in maternity roosts (c. 20-40 females) from November through to January in roof domes in caves, overhangs, mine adits and concrete structures. They remain loyal to the same cave over many years. Optimum survey months, November to January.	N/A	N	**Y**
Miniopterus australis Little Bent-winged Bat *Miniopterus orianae oceanensis* Large Bent-winged Bat	Breeding habitat: Cave, tunnels, mines, culverts or other structures known or suspected to be used for breeding. Optimum survey months, December to February.	BAM habitat constraint : Cave, tunnel, mine, culvert or other structure known or suspected to be used for breeding including species records in BioNet with microhabitat code 'IC – in cave' observation type code 'E nest-roost' with numbers of individuals >500 or from the scientific literature	N	N

Species Name and Survey Requirements	Habitat Requirements	Justification for Exclusion	Assumed Present (Y/N)	Targeted Survey Required (Y/N)
Deyeuxia appressa	Known from only two pre-1942 records in the Sydney Area. Was first collected in 1930 at Herne Bay, Saltpan Creek, off the Georges River, south of Bankstown. Was then collected in 1941 from Killara, near Hornsby. Flowers spring to summer and is mesophytic (grows in moist conditions). Optimum survey month, December.	N/A	N	**Y**
Diuris bracteata	The complete absence of records for most of the 20th Century resulted in this species being listed as 'presumed extinct' on Part 4 of Schedule 1 of the Threatened Species Conservation Act 1995. This listing status was updated in 2005 to Endangered under the Act after several specimens were found in the Sydney Basin (Duffy's Forest, Mount White and Kulnura). In recent years, however, these specimens are considered to have been incorrectly identified and are considered to be *Diuris platichila* (Peter Weston May 2013). Optimum survey months, August to September. The species is considered to be extinct, though the listing status under the *Biodiversity Conservation Act 2016* does not yet reflect this status.	N/A	N	**Y**

Species Name and Survey Requirements	Habitat Requirements	Justification for Exclusion	Assumed Present (Y/N)	Targeted Survey Required (Y/N)
Prostanthera marifolia Seaforth Mintbush	Currently only known from the northern Sydney suburb of Seaforth and has a very highly restricted distribution within the Sydney Basin Bioregion. The single population is fragmented by urbanisation into three small sites. All known sites are within an area of 2x2 km. The sites are within the local government area of Northern Beaches Council.	N/A	N	**Y**
Rhizanthella slateri Eastern Australian Underground Orchid	Highly cryptic given that it grows almost completely below the soil surface, with flowers being the only part of the plant that can occur above ground. Flowers September to November. Optimum survey months, September to November.	N/A	N	**Y**
Rhodamnia rubescens Scrub Turpentine	In NSW occurs in coastal districts north from Batemans Bay, approximately 280 km south of Sydney, to areas inland of Bundaberg, Qld. Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils.	N/A	N	**Y**
Camarophyllopsis kearneyi *Hygrocybe anomala* var. *ianthinomarginata*	Creeks or drainage lines or within 500 m of semi-permanent/ephemeral wet areas. Optimum survey months, May to June.	Subject land within 160 m of Mullet Creek and thus, the species has been retained as a species credit species.	N	**Y**

Species Name and Survey Requirements	Habitat Requirements	Justification for Exclusion	Assumed Present (Y/N)	Targeted Survey Required (Y/N)
Hygrocybe aurantipes *Hygrocybe austropratensis* *Hygrocybe collucera* *Hygrocybe griseoramosa* *Hygrocybe lanecovensis* *Hygrocybe reesiae* *Hygrocybe rubronivea*				

4.3 Threatened Species Surveys

Targeted species surveys were undertaken by E. G. Dalby-Ball on 25 February 2019, 4 December 2020, 3 April 2022, 25 June 2022, 9 September 2022 and 11 November 2022, E. G. Dalby-Ball and L. Johnson on 16 October 2020, G. James on 8 February 2023, and E. G. Dalby-Ball and B. Thompson on 15 December 2023.

Targeted species surveys included the following survey techniques:

- Parallel field traverses were conducted on 25 February 2019, 16 October 2020, 4 December 2020, 3 April 2022, 25 June 2022, 9 September 2022, 11 November 2022, 8 February 2023 and 15 December 2023 in accordance with *Surveying threatened plants and their habitats* (DPIE 2020).
- Bat detectors (Anabat Swift, Titley Scientific) were installed on 11 November 2022 to 17 November 2022.

4.3.1 Flora and Fungi

Table 4.4 details the targeted species surveys conducted including survey effort and results.

Table 4.4. Summary of surveys conducted.

Species Surveyed	Survey Effort	Survey Timing	Recorded (Y/N)
Deyeuxia appressa	10-20 m parallel field traverses were conducted across the entire subject land and the species was not observed.	4 December 2020 15 December 2023	N
Diuris bracteata	10-20 m parallel field traverses were conducted across the entire subject land and the species was not observed.	9 September 2022	N
Prostanthera marifolia (Seaforth Mintbush)	10-20 m parallel field traverses were conducted across the entire subject land and the species was not observed.	9 September 2022	N
Rhodamnia rubescens (Scrub Turpentine)	10-20 m parallel field traverses were conducted across the entire subject land and the species was not observed.	25 February 2019 16 October 2020 4 December 2020 3 April 2022 25 June 2022 9 September 2022 11 November 2022 8 February 2022 15 December 2023	N
Rhizanthella slateri (Eastern Australian Underground Orchid)	5-10 m parallel field traverses were conducted across the entire subject land and the species was not observed.	16 October 2020 9 September 2022	N

Species Surveyed	Survey Effort	Survey Timing	Recorded (Y/N)
Camarophyllopsis kearneyi *Hygrocybe anomala var. ianthinomarginata* *Hygrocybe aurantipes* *Hygrocybe austropratensis* *Hygrocybe collucera* *Hygrocybe griseoramosa* *Hygrocybe lanecovensis* *Hygrocybe reesiae* *Hygrocybe rubronivea*	5-10 m parallel field traverses were conducted across the entire subject land and the species were not observed.	25 June 2022	N

4.3.2 Microbats

Bat calls were recorded in full spectrum format using an Anabat Swift bat detector (Titley Scientific) installed on the subject land from the 11th to the 17th of November 2022.

A total of 3,796 call sequences were recorded, of which 281 call sequences were able to be analysed (i.e., were not 'noise' files or bat calls of short length). Of the bat calls, 56 call sequences (20%) were able to be confidently identified (those classified as either definite or probable identifications) to species level (Table 4.5). Species recorded confidently within the site include:

- *Austronomus australis* (White-striped Free-tailed Bat)
- *Chalinolobus gouldii* (Gould's Wattled Bat)
- *Miniopterus australis* (Little Bent-winged Bat)
- *Ozimops ridei* (Ride's Free-tailed Bat)

Additionally, the following bat species potentially occurred within the site, but could not be confidently identified (those calls classified as possible or as a species group):

- *Chalinolobus morio* (Chocolate Wattled Bat)
- *Falsistrellus tasmaniensis* (Eastern Falsistrelle)
- *Micronomus norfolkensis* (Eastern coastal Free-tailed Bat)
- *Miniopterus orianae oceanensis* (Eastern Bent-winged Bat)
- *Myotis macropus* (Large-footed Myotis)
- *Nyctophilus geoffroyi* (Lesser long-eared bat)
- *Nyctophilus gouldi* (Gould's long-eared bat)
- *Scoteanax rueppellii* (Greater Broad-nosed Bat)
- *Scotorepens orion* (Eastern Broad-nosed Bat)
- *Vespadelus darlingtoni* (Large Forest Bat)
- *Vespadelus pumilus* (Eastern Forest Bat)
- *Vespadelus regulus* (Southern Forest Bat)
- *Vespadelus troughtoni* (Eastern cave bat)
- *Vespadelus vulturnus* (Little Forest Bat)

Table 4.5 below summarises the results of the bat call analysis.

Table 4.5. Results of bat call analysis (number of passes per site per night).

Key: V – Vulnerable; E – Endangered; X – listed as. For species group identifications where one or more of the species are listed as threatened, the species initials that are listed as threatened have been entered into the EPBC Act, BC Act, Species Credit, Ecosystem Credit and/or SAII columns.

Confidence	Identification	EPBC Act	BC Act	Species Credit	Ecosystem Credit	SAII	11/11/2022	12/11/2022	13/11/2022	14/11/2022	15/11/2022	16/11/2022	17/11/2022
Definite	*Austronomus australis*	-	-	-	-	-	-	-	1	-	-	-	-
	Chalinolobus gouldii	-	-	-	-	-	-	1	6	1	-	1	-
	Miniopterus australis	-	V	X	X	Breeding	-	-	1	1	-	-	-
	Ozimops ridei	-	-	-	-	-	4	-	-	-	-	-	-
Probable	*Austronomus australis*	-	-	-	-	-	-	-	1	-	-	-	-
	Chalinolobus gouldii	-	-	-	-	-	1	1	26	2	2	-	-
	Miniopterus australis	-	V	X	X	Breeding	-	-	1	1	2	-	-
	Ozimops ridei	-	-	-	-	-	3	-	-	-	-	-	-
Possible	*Austronomus australis*	-	-	-	-	-	-	-	1	-	-	-	-
	Chalinolobus gouldii	-	-	-	-	-	-	-	8	-	2	-	-
Species Groups	*Chalinolobus gouldii / Micronomus norfolkensis / Ozimops ridei*	-	Mn	-	Mn	-	-	1	35	3	7	-	-
	Chalinolobus gouldii / Ozimops ridei	-	-	-	-	-	2	10	103	13	14	4	-

Confidence	Identification	EPBC Act	BC Act	Species Credit	Ecosystem Credit	SAII	11/11/2022	12/11/2022	13/11/2022	14/11/2022	15/11/2022	16/11/2022	17/11/2022
	Chalinolobus gouldii / Scoteanax rueppellii	-	Sr	-	Sr	-	-	-	2	2	-	-	-
	Chalinolobus morio / Vespadelus pumilus / Vespadelus vulturnus / Vespadelus troughtoni	-	Vt	-	Vt	-	-	-	3	1	-	1	-
	Falsistrellus tasmaniensis / Scotorepens orion / Scoteanax rueppelli	-	Ft Sr	-	Ft Sr	-	-	5	-	-	-	-	-
	Miniopterus australis / Vespadelus pumilus	-	Ma	Ma	Ma	Ma	-	-	1	-	-	-	-
	Miniopterus orianae oceanensis / Vespadelus darlingtoni / Vespadelus regulus	-	Moo	Moo	Moo	Moo	-	1	4	-	-	1	-
	Myotis macropus / Nyctophilus geoffroyi / Nyctophilus gouldi	-	Mm	Mm	-	-	-	-	-	-	1	-	-
Unknown	Unknown	-	-	-	-	-	-	2	65	1	3	2	-
	'Noise' files	-	-	-	-	-	332	37	1907	276	769	43	78
TOTAL							**342**	**58**	**2165**	**301**	**800**	**52**	**78**

The Little Bent-winged Bat (*Miniopterus australis*) calls were detected near the subject land (Table 4.5); however, given the absence of breeding habitat on the subject land, this species has been discounted as a species credit species. *Miniopterus australis* has been retained in the BAM-C as an ecosystem credit species (i.e., foraging habitat).

4.4 Species Polygons

The important habitat map for the Swift Parrot that occurs within the subject land has been used as a species polygon for this species (see Figure 4.3).

Figure 4.2. Swift Parrot species polygon.

5 Prescribed Impacts

Clause 6.1 of the Biodiversity Conservation Regulation 2017 identifies prescribed additional biodiversity impacts (prescribed impacts) to be assessed as part of the BOS. Such prescribed impacts (including direct and indirect impacts) are impacts:

a. on the habitat of threatened entities including:
    i. karst, caves, crevices, cliffs, rocks and other geological features of significance, or
    ii. human-made structures, or
    iii. non-native vegetation
b. on areas connecting threatened species habitat, such as movement corridors
c. that affect water quality, water bodies and hydrological processes that sustain threatened entities (including from subsidence or upsidence from underground mining)
d. on threatened and protected animals from turbine strikes from a wind farm
e. on threatened species or fauna that are part of a TEC from vehicle strikes.

Table 5.1 lists prescribed impacts and whether each prescribed impact is relevant to the proposal.

Table 5.1. Prescribed Impacts.

Feature	Relevant (Y/N)	If yes, address assessment questions (BAM Section 6 and 8)
Karst, caves, crevices, cliffs, rocks or other geological features of significance	Y	The western portion of the subject land contains large sandstone boulders and rock crevices. There are no karst, caves, cliffs, or other geological features of significance on the subject land. **Prepare a list of threatened entities that use or are likely to use these habitat features on the subject land and within the surrounding assessment area (BAM Section 6.1.1(a.)).** Based on nearby records and habitat requirements the Rosenberg's Goanna (*Varanus rosenbergi*) is considered likely to use these habitat features on the subject land and within the surrounding assessment area. **Describe how these features provide habitat for, or are used by, each threatened entity (BAM Section 6.1.1(b.)).** Rosenberg's Goanna shelters in hollow logs, rock crevices and in burrows. The subject land provides habitat for the species in the form of hollow logs and rock crevices. These habitat features are being retained. **Predict the nature, extent and duration of short-term and long-term impacts (BAM Section 8.3.1(a.)).** Short-term impacts to the Rosenberg's Goanna are expected during the construction phase of the development. It is expected that the

Feature	Relevant (Y/N)	If yes, address assessment questions (BAM Section 6 and 8)
		species would avoid the subject land due to noise during construction. Long-term impacts to the species would include the impacts of domestic animals. Cats and dogs are to be kept inside or restrained to areas adjacent to where this species occurs. Horses are to be kept within paddocks. **Predict the consequences of impacts on threatened entities (BAM Section 8.3.1(b.)).** The habitat features within the subject land are not considered to be an important or limiting resource for the Rosenberg's Goanna. Critical habitat for the species is forests and woodlands containing termite mounds where the species lay their eggs. The subject land does not contain any termite mounds. The species is only predicted to utilise the habitat within the subject land intermittently for shelter or foraging. These habitats are being retained and no breeding habitat would be impacted by the proposal.
Human-made structures	Y	The subject land contains a residential dwelling. **Provide a description of the type of human-made structure (BAM Section 6.1.2(a.)).** The dwelling is a single storey timber cottage with a metal roof. **Prepare a list of threatened species that use these features as habitat (BAM Section 6.1.2(b.)).** The Greater Broad-nosed Bat, Yellow-bellied Sheathtail-bat, Southern Myotis, Eastern False Pipistrelle, Eastern Coastal Free-tailed Bat, Little Bent-winged Bat and Large Bent-winged Bat are known to use buildings and other man-structures for roosting. **Describe how each threatened species could, or does, use the human-made structure as habitat (BAM Section 6.1.2(c.)).** The existing dwelling was inspected by ecologists for potential microbat habitat. The existing dwelling did not host any roosting microbats (December 2023) and is not considered suitable roosting habitat for these species. **Describe the nature, extent and duration of short-term and long-term impacts (BAM Section 8.3.2(a.)).** The demolition of human-made structures is not anticipated to impact any threatened species.

Feature	Relevant (Y/N)	If yes, address assessment questions (BAM Section 6 and 8)
		Predict the consequences of impacts on threatened entities (BAM Section 8.3.2(b.)). The demolition of human-made structures is not anticipated to impact any threatened species.
Non-native vegetation	N	The proposal does not involve the clearing of any non-native vegetation that provides habitat for threatened species.
Movement corridors	Y	The subject land's vegetation forms part of a significant vegetated link which connects Ku-ring-gai and Garigal National Parks with the Irrawong Reserve, Warriewood Wetlands and Narrabeen Lagoon. **Prepare a list of threatened entities that are likely to use or are a part of the connectivity or corridor** The corridor contains records of the Giant Burrowing Frog, Red-crowned Toadlet, Rosenberg's Goanna, White-bellied Sea-eagle, Scarlet Robin, Freckled Duck, Gang-gang Cockatoo, Little Lorikeet, Swift Parrot, Powerful Owl, Eastern Pygmy-possum, Squirrel Glider, Grey-headed Flying-fox, Large-eared Pied Bat, Little Bent-winged Bat, Large Bent-winged Bat, Eastern Coastal Free-tailed Bat, Eastern Cave Bat, and Southern Myotis. The Little Bent-winged Bat was recorded on/near the subject land during microbat surveys. **Describe the importance of the connectivity to threatened entities, particularly for maintaining movement that is crucial to the species' life cycle** The proposal would remove 35 trees from the edge of the habitat corridor. The trees are considered foraging habitat for the Little Bent-winged Bat. The affected area of foraging habitat would represent a small percentage of the total extent of the habitat corridor. Given the relatively widespread nature of vegetation and abundance of high-quality foraging habitat within the locality, the proposal is not expected to significantly affect the life cycle of the species. **Describe the nature, extent and duration of short-term and long-term impacts** The proposal would remove 35 trees. The long-term impact of tree removal is the loss of foraging habitat for threatened species within the locality.

Feature	Relevant (Y/N)	If yes, address assessment questions (BAM Section 6 and 8)
		Predict the consequences of impacts for the persistence of the threatened entities identified in Subsection 6.1.3, taking into consideration mobility, abundance, range and other relevant life history factors Threatened microbats are highly mobile and would freely fly long distances over open areas including urbanised city centres to move between foraging sites and roost sites. The proposal would not affect the movement of threatened microbats between habitat patches.
Waterbodies, water quality and hydrological processes	N	The subject land does not contain waterbodies.
Wind turbine strikes	N	The proposal is not a wind farm development.
Vehicle strikes	N	The proposal does not increase car parking above that which already exists and is not anticipated to result in additional vehicle strike risk to any threatened species.

Stage 2: Impact Assessment

6 Avoid and Minimise Impacts

6.1 Direct Impacts

6.1.1 Clearing of trees

Avoid

1.3	The supplied plans show no works are proposed within the TPZs of Trees 2, 3, 4, 9, 10, 12, 13, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 34, 36, 37, 38, 39, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 67, 68, 73, 74, 75, 76, 77, 78, 80, 81, 82, 83, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 107, 108, 109, 110, 112, 113, 114, 115, 116, 118, 119, 120, 121, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 135, 136, 137, 139, 140, 141, 144, 145, 149, 150, 151, 152, 153, 154, 155, 159, 160, 161, 162 & 163. However, the tree protection measures outlined in this report should be implemented to avoid indirect impacts.

Source: Arboricultural Impact Assessment & Tree Protection Specification (L&Co 07 April 2023)

Minimise

1.4	The proposed works represent a *Minor Encroachment* (as defined by AS4970) on Trees 31, 40, 62, 70. However, a minor encroachment is considered acceptable by the standard when it is compensated for elsewhere and contiguous within the TPZ, as in the current cases. Further, the tree protection measures outlined in this report will reduce the likelihood of negative impacts on Trees 40 & 62.
1.5	The proposed engineering works are within the SRZs of Trees 29 & 30. The proposed horse path is within the SRZ of Tree 79. Works within the SRZ represent a *Major Encroachment* (as defined by AS4970). However, negative impacts can be minimised and the trees retained if the tree sensitive construction methods and protection measures outlined in this report are implemented. The proposed works are considered acceptable under the Australian Standard AS4970, Clause 3.3.4.
1.6	The proposed engineering works are within the TPZs of Trees 32 & 69. The proposed parking is within the TPZ of Tree 7. The proposed driveway is within the TPZ of Tree 16. The proposed horse path is within the TPZ of Tree 117 and the proposed manure store and horse rink is within the TPZ of Tree 142. The TPZ encroachment was greater than 10% of the TPZ and represents a *Major Encroachment* (as defined by AS4970). However, negative impacts can be minimised if the tree sensitive construction methods and protection measures outlined in this report are implemented and be acceptable under the Australian Standard AS4970, Clause 3.3.4.

Source: Arboricultural Impact Assessment & Tree Protection Specification (L&Co 07 April 2023)

Mitigate

1.9	All trees located within the proposed horse paddocks should have permanent trunk protection installed in the form of wooden fencing to prevent mechanical damage from horse activities.
1.10	The location of the underground services was not detailed in the supplied plans. The installation of underground services should be located outside of the TPZs detailed in this report. Where this is not possible, they should be installed around or below roots (>25mm∅) using either hydrovac or hand excavation and supervised by the Project Arborist.

Source: Arboricultural Impact Assessment & Tree Protection Specification (L&Co 07 April 2023)

6.1.2 Native fauna

Council's Biodiversity Officer conducted a site inspection and observed a hollow was being occupied by a native glider within Tree 113. This tree is being retained and protected. Bunting is to be used to fence off the tree during development to ensure that the tree is not disturbed.

6.2 Indirect Impacts

The proposal is to ensure any indirect impacts are avoided, minimised, and mitigated through the implementation of mitigation measures. Section 7.2 provides further information on avoiding and minimising indirect impacts.

6.3 Prescribed Impacts

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

The subject land contains rocks and rock crevices which form habitat for threatened species such as the Rosenberg's Goanna. The proposal does not involve the clearing or modification of rock features on the subject land.

6.3.2 Human-made structures

The existing dwelling does not host any roosting microbats; however, microbats are known to utilise buildings and human-made structures for roosting. Prior to the demolition of the existing dwelling, an ecologist is to undertake a pre-clearance survey to check the existing dwelling for any evidence of roosting microbats (i.e., faeces, visual observation). Where roosting microbats are found, a suitability qualified and vaccinated person is to be engaged to relocate the species.

For cave dwelling species, a temporary mock cave (e.g., shed) is to be installed on the subject land. The relocator is to encourage and move bats into the mock cave. When microbats leave the mock cave, the structure may be removed.

For hollow dwelling species, microbats are to be relocated into next boxes and the boxes are to be installed in trees to be retained on the subject land.

6.3.3 Movement corridors

The subject land's vegetation forms part of a significant vegetated link which connects Ku-ring-gai and Garigal National Parks with the Irrawong Reserve, Warriewood Wetlands and Narrabeen Lagoon. The proposal would remove 35 trees from the edge of the corridor on the subject land. The proposal does involve breaking apart large high-quality blocks of vegetation on the subject land, so no fragmentation or isolation is expected. The proposal would reduce the extent of the corridor on the subject land.

The clearing of trees will be offset through the retirement of one ecosystem credit for PCT 3176. However, additional tree planting will also be conducted to mitigate the loss of trees.

7 Impact Assessment

7.1 Direct Impacts

7.1.1 Native Vegetation

The proposal requires the clearing of thirty-three native trees to facilitate the development in its current form. Figure 7.1 shows an extract of the AIA detailing the trees and justification for their removal.

1.7 The proposed works are also within the SRZs of Trees 1, 14, 15, 17, 63, 65, 71, 72, 88 & 111, 143 and represent a *Major Encroachment* (as defined by AS4970). However, these trees will need to be removed as the TPZ encroachment is too large for their long-term viability, based on a consideration of their health, structure and the size of the encroachment. These trees were all assigned Low to Moderate Landscape Significance Values except for Trees 65 & 71, which were assigned High Landscape Significance Values.

1.8 Trees 5, 6, 8, 11, 18, 33, 35, 64, 66, 84, 85, 86, 87, 89, 122, 123, 134, 138, 146, 147, 148, 156, 157 & 158 are within the proposed development footprint and will need to be removed. These trees were mostly assigned Low to Moderate Landscape Significance Values except for Trees 35 & 69 which were assigned High Landscape Significance Values.

Figure 7.1. Summary of tree impacts.

Source: Arboricultural Impact Assessment & Tree Protection Specification (L&Co 07 April 2023).

Table 7.1 identifies the trees to be removed. Figure 7.2 shows the location of trees to be removed.

Table 7.1. Trees to be removed.

Tree No.	Species	Type
1	*Jacaranda mimosifolia* (Jacaranda)	Exotic
5	*Macadamia integrifolia* (Macadamia)	Macadamia Nut is listed as vulnerable under the EPBC Act. The species occurs from Mt Bauple, near Gympie, to Currumbin Valley in the Gold Coast hinterland, south-east Queensland (Approved Conservation Advice for *Macadamia integrifolia* (Macadamia Nut) 2008). It is not known to occur naturally in the wild in NSW (PlantNET). This species is frequently cultivated for its fruit and is likely a planted species on the subject land.
6	*Callistemon viminalis* (Weeping bottlebrush)	Non-local native, widely cultivated
8, 147, 157	*Glochidion ferdinandi* (Cheese tree)	Local native
14, 15, 18, 88, 33, 66, 85, 86	*Syncarpia glomulifera* (Turpentine)	Local native
17, 84, 89, 122	*Allocasuarina littoralis* (Black she oak)	Local native
35	*Eucalyptus piperita* (Sydney peppermint)	Local native
63	*Banksia serrata* (Old man banksia)	Local native

65, 71	*Eucalyptus umbra* (Broad-leaved white mahogany)	Local native
11, 64, 72, 138, 146, 156	*Angophora floribunda* (Rough barked apple)	Local native
87, 111, 143	*Angophora costata* (Sydney red gum)	Local native
123	Dead	
134	*Melicope elleryana* (Doughwood)	Non-local native
148	*Eucalyptus robusta* (Swamp mahogany)	Local native
158	*Syzygium australe* (Brush cherry lilly pilly)	Local native

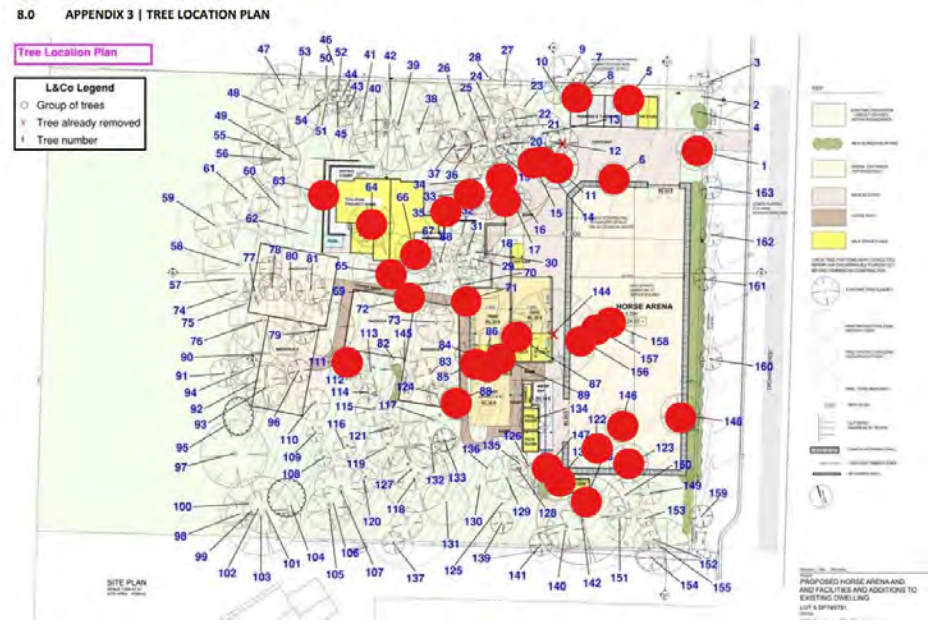

Figure 7.2. Tree Location Plan.
Source: Arboricultural Impact Assessment & Tree Protection Specification (L&Co 07 April 2023) (Edited by Kingfisher).

7.1.2 Vegetation Integrity

The proposal requires the permanent removal of 0.03 ha of native vegetation for the proposed structures, comprising of 0.02 ha of PCT 3176 in low condition and 0.01 ha of PCT 3176 in moderate condition.

The proposal also requires the modification of 0.32 ha of native vegetation for the proposed horse arena, paddocks and APZ, comprising of 0.23 ha of PCT 3176 in low condition and 0.09 ha of PCT 3176 in moderate condition.

The change in vegetation integrity score is summarised in Table 7.2.

Table 7.2. Change in vegetation integrity score (VIS).

Vegetation Zone	Condition	Area (ha)	Current Vegetation Integrity Score	Change in Vegetation Integrity Score	Future Vegetation Integrity Score
PCT 3176_1	Moderate	0.14	24.9	-20	4.9
PCT 3176_2	Low (Boulders)	0.26	12.6	-3.6	9
PCT 3176_3	Low	0.41	11.9	-7.3	4.6

The clearing and modification of native vegetation on the subject land will be offset through the retirement of one ecosystem credit for PCT 3176.

7.1.3 Threatened Species Habitat

The clearing of trees and other vegetation includes the removal of mapped important habitat for the Swift Parrot; however, no preferred feed trees are being removed.

7.1.4 Future 10/50 clearing entitlement

Future 10/50 clearing entitlement associated with the new structures provide that 0.03 ha of all tree, shrubs and groundcovers within the 10 metre clearing entitlement area, and 0.32 ha of understorey within the 50 metre clearing entitlement areas may be cleared without seeking approval. These potential impacts have been included in the BAM calculations; however, these areas are proposed for retention and the proposal does not directly impact these areas.

7.2 Indirect Impacts

The proposal may result in a range of minor indirect impacts affecting threatened species and communities. Table 7.3 provides a summary of potential indirect impacts to biodiversity values on the subject land.

Impact	Project Phase	Nature	Extent	Frequency	Duration	Timing	Consequence on biodiversity values
Noise	Construction and operation	Construction and operational noise disturbing fauna activity within the subject land and adjacent vegetation	Subject land and adjacent vegetation	Daily, during construction and operation	Construction and operational phase of the project	Potential long-term impact	The proposal is unlikely to increase noise levels above that which already exists. Short-term increased noise is expected during the construction phase of the project. Construction works are to be undertaken during standard working hours.
Light	Operation	Light spill disturbing fauna within the subject land and adjacent vegetation	Subject land and adjacent vegetation	Nightly	Operational phase of the project	Potential long-term impact	Light spill (light that goes into non-target areas) can cause disturbance to sensitive species such as microbats. Dark Sky lighting will be used to focus light on areas where needed whilst reducing light spill into surrounding environmentally sensitive areas. This form of light provides the required 'safe lighting' of areas

Impact	Project Phase	Nature	Extent	Frequency	Duration	Timing	Consequence on biodiversity values
							whilst greatly reducing upward escaping light. Any lighting to be used will be shielded.
Transport of weeds and pathogens from the site to adjacent vegetation	Construction and operation	Spread of weeds and pathogens from machinery, tools, equipment and clothing	Subject land and potential to spread to adjacent vegetation	Daily	Construction and operational phase of the project	Potential long-term impact	Construction activities may introduce weeds and pathogens to the subject land on machinery, tools, equipment and clothing (e.g., boots). The condition of retained and adjacent vegetation could be decreased. Providing that weeds are continually managed and bushland hygiene protocols are followed during construction and operational phases of the project the risk of weed and pathogen infestation is low.
Loss of breeding habitat	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Impact	Project Phase	Nature	Extent	Frequency	Duration	Timing	Consequence on biodiversity values
Trampling of threatened flora species	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fertiliser drift	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rubbish dumping	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Wood collection	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Removal and disturbance of rocks, including bush rock	N/A	N/A	N/A	N/A	N/A	N/A	N/A

8 Serious and Irreversible Impacts

8.1 Identification of entities at risk of an SAII

Two threatened species identified to be at risk of serious and irreversible impacts (SAII entities) are assessed in this section (see Table 8.1).

The information in the following sections is provided to assist the consent authority to evaluate the nature of an impact on a potential entity at risk of an SAII (in accordance with BAM Sections 9.1.1 and 9.1.2).

Table 8.1. Entities at risk of an SAII.

Common name	Scientific name	Reason for inclusion in assessment
Swift parrot	*Lathamus discolor*	Identified on the current list of entities at risk of an SAII and is likely to be impacted by the proposal

8.2 Threatened species at risk of an SAII (Swift Parrot)

Lathamus discolor (Swift Parrot) is assessed in this section as it is an SAII threatened species. In accordance with BAM Section 9.1.2 the following information is provided to assist the consent authority in determining whether or not the proposal represents a serious and irreversible impact on this threatened species.

8.2.1 Measures taken to avoid the direct and indirect impacts on the species at risk of an SAII

The subject land contains approximately 7,775 m^2 (or 0.77 ha) of mapped important habitat for the Swift Parrot. Approximately 4,021 m^2 (or 0.4 ha) of this area will be impacted by the clearing of trees and other vegetation to facilitate the construction of the new dwelling and paddocks, and the removal of leaf litter and other debris for the establishment of the APZ; however, this will not impact on foraging habitat for the species.

Favoured foraging trees for the Swift Parrot include winter flowering species such as *Eucalyptus robusta*, *Corymbia maculata*, *C. gummifera, E. tereticornis*, *E. sideroxylon*, and *E. albens* (which are absent from the subject land except for *C. gummifera*; however, this tree species is being retained). Commonly used lerp infested trees include *E. microcarpa*, *E. moluccana*, *E. pilularis*, and *E. melliodora* (which are absent from the subject land).

8.2.2 Current status

Table 8.2. Current status – *Lathamus discolor* (Swift Parrot).

Criteria	Data / Information	Data Sources	Details of data, deficiency, assumptions, reasons for low confidence in information
Evidence of rapid decline (Principle 1)			
Change in population size in NSW in the past 10 years or 3 generations (indicate whether as a direct estimate of the population or if indicated by an index or surrogate)	The Swift Parrot population was estimated to be 2,000 individuals in 2010 (Garnett *et al*., 2011). More recent estimates, predict the population of this species to be 750 with a maximum of 1,000 (M Webb, D Stijanovic, R Heinsohn unpublished). Studies have predicted that population viability is likely to decrease by 79-95% over 12-18 years (Heinsohn *et al*., 2015). Other studies have predicted a	TBDC	N/A

	further 6% (Heinshon *et al.*, 2019). These projected declines are consistent with findings of annual assessments of over 1,000 breeding sites across the breeding range. These assessments track variation and abundance across the range. Habitat loss and habitat degradation are significant threats impacting breeding (nesting and foraging) habitat.		
Evidence of small population size (Principle 2)			
Current population size in NSW	The Swift Parrot breeds in Tasmania, where the breeding population has declined from in excess of 10,000 pairs to less than 1,000 pairs (Forshaw 1993, Garnett 1993, Brereton 1998). Numbers in New South Wales are considerably less than this.	NSW Scientific Committee – final determination (Page last updated 9 June 2021)	N/A
Decline in species' population size in 3 years or one generation	Population reduction >80% in 10 years of 3 generations	TBDC	N/A
Number or percentage of mature individuals in each subpopulation or whether the species is likely to undergo extreme fluctuations	2,000	Threatened Species Strategy – Year 3 Priority Species Scorecard (2018)	Information derived from the Conservation Advice (Threatened Species Scientific Committee 2016), with some amendments made by contributing experts based on new information.
Evidence of limited geographic distribution (Principle 3)			
Extent of occurrence (ha)	The full extent of occurrence (EOO) for this species was estimated at 57,000 km^2 in the Action Plan for Australian Birds 2010 (Garnett *et al.*, 2011), which is not considered limited.	Threatened Species Scientific Committee (2016). Conservation Advice *Lathamus discolor* Swift Parrot.	
Area of occupancy (ha)	Area of occupancy appears to have declined significantly since European settlement, as can be inferred from the extent of habitat loss. For example, 70% percent of box-ironbark habitat (the principal wintering habitat of the swift parrot on the mainland) has been cleared in NSW. White box-yellow gum-Blakely's red gum woodland, another important habitat in NSW, has been reduced to less than 4 percent of its pre-European extent on the south-western slopes and southern tablelands of NSW. Area of Occupancy: 1,400 km^2	Threatened Species Strategy – Year 3 Priority Species Scorecard (2018)	
Number of threat-defined location	The majority of Swift Parrot foraging sites in NSW, Queensland and South Australia occur outside conservation reserves and		No threat defined locations are listed in the TBDC.

	therefore continue to be vulnerable to loss, fragmentation or disturbance.		
Whether the species' population is likely to undergo extreme fluctuations	Projected that Swift Parrots will undergo substantial declines within three generations.	Threatened Species Strategy – Year 3 Priority Species Scorecard (2018)	Population Viability Analysis (Heinsohn et al. 2015) (based on modelled scenarios that considered impacts of sugar glider predation).

8.2.3 Impact assessment

Table 8.3. Impact assessment – *Lathamus discolor* (Swift Parrot).

Impact	Data / Information	Data Sources	Details of data, deficiency, assumptions, reasons for low confidence in information
Number of individuals (mature and immature) present in the subpopulation on the subject land	NSW BioNet Atlas was used to investigate records of the Swift Parrot within or near the subject land. The site is centred within a 10 km x 10 km square (investigation area). There are 27 records of the Swift Parrot. None of the records were within the site. The closest record is approximately 600 m from the subject land.	NSW BioNet Atlas	N/A
Number of individuals (mature and immature) present as a percentage of total NSW population (%)	N/A The Swift Parrot occurs as a single, migratory population.	Threatened Species Strategy – Year 3 Priority Species Scorecard (2018)	N/A
Area of habitat to be impacted (ha) (for species measured by area only) Area of the species' geographic range to be impacted by the proposal (ha)	Approximately 0.4 ha of mapped important habitat will be impacted. No preferred foraging habitat trees will be impacted.	BAM Swift Parrot Important Habitat Map	Extent of mapped habitat impacted calculated in QGIS v3.28.10
Area of the species' geographic range to be impacted as a percentage of the total area or extent of occupancy (%)	0.0002% of occupancy		Extent of mapped habitat impacted calculated in QGIS v3.28.10
Individuals impacted	No individuals will be directly impact.		
Viability of a fragmented population	The species areas of mapped important habitat will not become fragmented.		The Swift Parrot is an extremely mobile migratory bird. The proposal will almost certainly not cause fragmentation for the species

9 Impacts Requiring Offset

9.1 Impacts on native vegetation and TECs (ecosystem credits)

Table 9.1 identifies impacts on native vegetation and TECs that require an offset (as per BAM Subsection 9.2.1(1.).

Table 9.1. Impacts that require an offset – ecosystem credits.

Vegetation Zone	Condition	Current VI	Future VI	Change VI	Credits Required
PCT 3176_1	Moderate	24.9	4.9	-20	1
PCT 3176_2	Low (Boulders)	12.6	9	-3.6	0
PCT 3176_3	Low	11.9	4.6	-7.3	0
Total Sydney Enriched Sandstone Moist Forest credit requirement					1

9.2 Impacts on threatened species and their habitat (species credits)

Table 9.2 identifies impacts on threatened species (species credits) that require an offset (as per BAM Subsection 9.2.2(2.).

Table 9.2. Impacts that require an offset – species credits.

Scientific Name	Common Name	Vegetation Zone	Credits Required
Lathamus discolor	Swift Parrot	Important Habitat Mapping	5
Total species credit requirement			5

9.3 Impacts that do not need further assessment

Areas within the subject land that do not contain native vegetation do not need to be assessed for ecosystem credits as per BAM Section 9.3(1-2.) (Figure 9.1) (as these areas do not provide habitat for threatened species e.g., exotic mown lawn).

10 Mitigation Measures

The impacts of the proposal are to be mitigated through the implementation of the following mitigation measures.

10.1.1 Delineation of work areas

During the development, impacts to the site and the vegetation to be retained should be minimised by the delineation of work areas. Access to the site would be best restricted to the development footprint only. An exclusion zone will be established for the vegetation outside the work areas.

10.1.2 Vegetation clearing protocols

Prior to removing any vegetation or other habitat that has been approved for removal, the applicant must engage a qualified and experienced Ecologist to:

- undertake a pre-clearing survey to delineate, map, and mark habitat-bearing trees and shrubs to be retained/removed and other fauna habitat features and determine the presence of any resident native fauna using nests, dreys, hollows, logs, etc.,
- supervise the clearance of trees and shrubs (native and exotic) and other habitat to capture, treat and/or relocate any displaced native fauna to an appropriate nearby location,
- remove sections of a tree containing a hollow or habitat prior to clearing and felling the tree.

10.1.3 Erosion and sediment controls

Where required, sediment controls will be put in place. These will include but are not limited to sediment fencing, jute mating, crushed sandstone, and coir logs. Sediment controls will be revised during the site inspection and/or after significant rainfall (more than 10 mm in 24 hours resulting in site runoff). Sediment and erosion control measures must ensure that no settlement of sediment or silt is to occur within areas of vegetation to be retained. All sediment fences should be retained for as long as practical. If removed, then monitoring is required to ensure flows do not concentrate and cause further erosion. If concentrated flows do occur and/or erosion gullies develop then coir logs baffles are required.

10.1.4 Tree protection

Tree protection as per the Arboricultural Impact Assessment.

10.1.5 Tree replacement ratio

Any trees removed should be replaced at a ratio greater than 1:1 (for trees not covered by a biodiversity offset) and consider that a tree replacement ratio of 2:1 is preferable to enhance habitat.

10.1.6 Weed management

Weeds are present on site and must be appropriately managed to ensure they do not spread. There must be continuous maintenance of the vegetation on site otherwise increased weed growth may result, exacerbated by the high abundance of weeds present pre-works. Weeds will colonize and pioneer on any cleared grounds, therefore must be managed during works as well as ongoing post-works.

All bush regeneration activities requiring the use of chemicals must be performed in accordance with the NSW Pesticides Act 1999. Herbicides must not be applied whilst exotic plants are setting seed. The weed removal program aims to be broad in approach and sustained in application to provide the best possible conditions for natural regeneration and to control weeds within the site.

Although soil-borne pathogens have not been identified as a Key Threatening Process, the accidental spread of pathogens can occur at any time. To prevent the introduction of pathogens, Bushland Hygiene Protocols outlined in Appendix II must be followed. Hydrological conditions may promote the spread of Phytophthora (a group of fungus-like diseases affecting plants) due to moist soil and proximity to water. It is recommended that Bushland Hygiene Protocols be followed closely.

10.1.7 Nest boxes

Nest boxes designed for microbats (x2) and gliders (x1) (hard-wood or marine-ply with stainless steel fixtures) will be installed on-site to increase habitat opportunities for native fauna within the subject land. Boxes are to be secured by hanging and not rely on nailing into trees. Boxes to be installed in trees to be retained and at least 3 m above ground.

10.1.8 Pathogen prevention

To prevent the introduction of pathogens, Bushland Hygiene Protocols outlined in Appendix III should be followed. The site is considered to be an area that may promote the spread of Phytophthora (a group of fungus-like diseases affecting plants) due to its moist soil and proximity to the drainage channel. It is recommended that Bushland Hygiene Protocols be followed closely.

Phytophthora infected vegetation. (Image by Rasbak, licensed under the Creative Commons Attribution-Share Alike 3.0 Unported, 2.5 Generic, 2.0 Generic and 1.0 Generic license.)

Myrtle Rust generally infects new leaf growth. (Image by John Tann, licensed under the Creative Commons Attribution 2.0 Generic license.)

10.1.9 Preparing of a BMP as per a condition of consent

A Biodiversity Management Plan (BMP) should be prepared by an appropriately qualified and experienced ecologist or bush regenerator and implemented for the protection, maintenance, management and improvement in perpetuity of existing and planted native vegetation and fauna habitats.

Table 10.1. Measures to be implemented before, during and after construction to avoid and minimise impacts of the proposal.

Action	Stage	Timing	Responsibility	Outcome
Delineate site access routes and environmental exclusion zones	Before construction	Installed before construction and retained during construction	Project Manager to organise fencing to delineate works area from areas of vegetation to be retained	Protect native vegetation and fauna habitat
Vegetation clearing controls	Before and during tree felling	Once	Arborist and Ecologist	Fauna protection
Fencing and tree protection	Before construction	Installed before construction and retained during construction	Arborist	Tree protection
Revegetation	Before, during or after construction	Ongoing	Ecologist to prepare a BMP detailing revegetation within the subject land Revegetation undertaken by Bush Regenerators	Habitat enhancement (birds, micro-bats)
Native species landscaping	Before, during or after construction	Ongoing	Landscape Architect	Habitat enhancement (birds, micro-bats)
Tree replacement	Before, during or after construction	Ongoing	Landscape Architect	Offset tree removal/habitat enhancement (birds, micro-bats)
Erosion and sediment controls	Before construction	Installed before construction and maintained during construction	Project Manager	Native vegetation/creek protection

Weed management	Before, during and after construction	Ongoing	Bush Regenerator	Protect and enhance native vegetation and fauna habitat
Nest box installation	Before construction	Installed once and replaced every 5 years	Arborist and Ecologist	Habitat enhancement (micro-bats)
Reuse of removed trees and hollows	During tree felling	Once	Arborist and Ecologist	Habitat enhancement (reptiles)
Pathogen prevention	Before, during and after construction	Ongoing	All personnel	Habitat protection
Preparation of a BMP	Before construction	Once and to be implemented for a period of 5 year	Ecologist	Protect and enhance native vegetation and fauna habitat

Appendix A – Field Data

PLOT 1

BAM Field Survey Form	Sheet 1 of 2

		Survey Name	Zone ID	Recorders		
Date	15.12.23	113 Orchard St	1	BT, GDB		
Zone		Datum	Plot ID	1	Plot Dimensions	20*20, 20* 50
56			IBRA Region	Sydney Basin	Midline bearing 0 m	283
Easting		Northing				
341016		6270881				
Vegetation Class		North Coast Wet Sclerophyll Forests				
Plant Community Type		Sydney Enriched Sandstone Moist Forest				

BAM Attribute 1000 sqm plot

Tree Strems Count

<5 cm	5-9 cm	10-19 cm	20-29 cm	30-49 cm	50-79 cm	80+ cm
NO	YES	YES	YES	YES	YES	1

Litter cover %

5 m	15 m	25 m	35 m	45 m	Average
80	80	100	100	100	92

Length of logs (m)	0
# Hollows	1

PLOT 1

Sheet 2 of 2		Survey Name	Plot ID	Recorders
Date	15.12.23	113 Orchard St	1	BT, GDB

GF Code	Species	N, E or HTW	Cover	Abund	Stratum
TG	*Syncarpia glomulifera* (Turpentine)	N	4	3	US
TG	*Allocasuarina torulosa*	N	1	1	US
TG	*Eucalyptus botryoides*	N	10	2	US
TG	*Angophora floribunda*	N	0.5	2	US
		TOTAL	15.5	4	
SG	*Breynia oblongifolia*	N	2	6	MS
		TOTAL	2	1	
GG	*Echinopogon caespitosus*	N	0.5	20	GS
GG	*Microlaena stipoides* (Weeping grass)	N	0.5	20	GS
GG	*Themeda australis* (Kangaroo grass)	N	0.5	20	GS
GG	*Imperata cyclindrica*	N	0.2	50	GS
GG	*Entolasia marginata*	N	0.2	20	GS
		TOTAL	1.9	5	
FG	*Hydrocotyle peduncularis*	N	1	12	GS
FG	*Commelina cyanea*	N	0.1	12	GS
FG	*Dianella caerulea*	N	0.1	3	GS
FG	*Pratia purpurascens*	N	0.1	8	GS
		TOTAL	1.3	4	
EG	*Adiantum aethiopicum* (Maidenhair fern)	N	1	20	GS
		TOTAL	1	1	
OG	*Livistona australis* (Cabbage palm)	N	2	1	GS
OG	*Cayratia clematidea*	N	1	30	GS
OG	*Stephania japonica*	N	1	20	GS
OG	*Eustrephus latifolius*	N	1	20	GS
OG	*Hibbertia scandens*	N	1	20	GS
OG	*Calochlaena dubia*	N	0.1	3	GS
OG	*Glycine clandestina*	N	0.1	1	GS
		TOTAL	6.2	7	

PLOT 2

BAM Field Survey Form	Sheet 1 of 2

		Survey Name	Zone ID	Recorders		
Date	15.12.23	113 Orchard St	2	BT, GDB		
Zone		Datum	Plot ID	2	Plot Dimensions	20*20, 20* 50
56			IBRA Region	Sydney Basin	Midline bearing 0 m	23
Easting		Northing				
340975		6270901				
Vegetation Class		North Coast Wet Sclerophyll Forests				
Plant Community Type		Sydney Enriched Sandstone Moist Forest				

BAM Attribute 1000 sqm plot

Tree Strems Count

<5 cm	5-9 cm	10-19 cm	20-29 cm	30-49 cm	50-79 cm	80+ cm
NO	YES	YES	YES	YES	YES	NO

Litter cover %

5 m	15 m	25 m	35 m	45 m	Average
90	90	80	80	100	88

Length of logs (m)	5
# Hollows	1

PLOT 2

Sheet 2 of 2		Survey Name	Plot ID	Recorders
Date	15.12.23	113 Orchard St	2	BT, GDB

GF Code	Species	N, E or HTW	Cover	Abund	Stratum
TG	*Angophora floribunda*	N	1	1	US
TG	*Allocasuarina torulosa*	N	1	3	US
TG	*Eucalyptus piperita*	N	5	3	US
TG	*Banksia serrata*	N	0.5	1	
		TOTAL	7.5	4	
SG	*Hibbertia aspera*	N	0.01	2	MS
SG	*Dodonaea* sp.	N	0.5	6	MS
		TOTAL	0.51	2	
GG	*Lomandra longifolia*	N	0.2	14	GS
GG	*Lomandra filiformis*	N	0.01	1	GS
GG	*Themeda australis* (Kangaroo grass)	N	0.01	20	GS
GG	*Aristida* sp.	N	0.01	1	GS
		TOTAL	0.23	4	
FG	*Pomax umbellata*	N	0.1	10	GS
FG	*Dianella caerulea*	N	0.05	2	GS
FG	*Commelina cyanea*	N	0.01	3	GS
FG	*Xanthosia pilosa*	N	0.01	1	GS
		TOTAL	0.17	4	
EG	*Pteridium esculentum*	N	0.1	4	GS
		TOTAL	0.1	1	
OG	*Xanthorrhoea arborea*	N	0.5	1	GS
OG	*Hibbertia scandens*	N	0.01	2	GS
		TOTAL	0.51	2	

PLOT 3

BAM Field Survey Form	Sheet 1 of 2

		Survey Name	Zone ID	Recorders		
Date	15.12.23	113 Orchard St	3			
Zone		Datum	Plot ID	3	Plot Dimensions	20*20, 20* 50
56			IBRA Region	Sydney Basin	Midline bearing 0 m	17
Easting		Northing				
340960		6270910				
Vegetation Class		North Coast Wet Sclerophyll Forests				
Plant Community Type		Sydney Enriched Sandstone Moist Forest				

BAM Attribute 1000 sqm plot

Tree Strems Count

<5 cm	5-9 cm	10-19 cm	20-29 cm	30-49 cm	50-79 cm	80+ cm
NO	YES	YES	YES	YES	YES	NO

Litter cover %

5 m	15 m	25 m	35 m	45 m	Average
90	70	70	70	80	76

Length of logs (m)	0
# Hollows	0

PLOT 3

Sheet 2 of 2		Survey Name	Plot ID	Recorders
Date	15.12.23	113 Orchard St	3	BT, GDB

GF Code	Species	N, E or HTW	Cover	Abund	Stratum
TG	*Angophora costata*	N	3	5	US
TG	*Allocasuarina torulosa*	N	1	6	US
TG	*Eucalyptus piperita*	N	1	3	US
TG	*Angophora floribunda*	N	1	1	US
TG	*Corymbia gummifera*	N	0.05	2	US
TG	*Notelaea longifolia*	N	0.01	1	MS
TG	*Banksia serrata*	N	1	1	MS
		TOTAL	7.06	7	
SG	*Acacia brownii*	N	0.5	2	MS
SG	*Hibbertia aspera*	N	0.01	10	MS
SG	*Elaeocarpus reticulatus*	N	0.01	2	MS
SG	*Correa reflexa*	N	0.01	7	MS
SG	*Persoonia linearis*	N	0.01	1	MS
		TOTAL	0.54	5	
GG	*Lomandra longifolia*	N	0.1	18	GS
GG	*Lomandra obliqua*	N	0.01	8	GS
GG	*Themeda australis* (Kangaroo grass)	N	0.01	7	GS
GG	*Imperata cyclindrica*	N	0.01	7	GS
GG	*Gahnia* sp.	N	0.01	2	GS
GG	*Entolasia marginata*	N	0.01	50	GS
		TOTAL	0.15	6	
FG	*Poranthera microphylla*	N	0.01	1	GS
FG	*Dianella caerulea*	N	0.01	10	GS
		TOTAL	0.02	2	
EG	*Asplenium nidus* (Bird's nest fern)	N	0.01	20	GS
EG	*Adiantum aethiopicum* (Maidenhair fern)	N	0.01	20	GS
EG	*Asplenium flabellifolium*	N	0.01	2	GS
EG	*Pteridium esculentum*	N	0.05	20	GS
		TOTAL	0.08	4	
OG	*Smilax glyciphylla*	N	0.01	1	GS
OG	*Hibbertia scandens*	N	0.01	4	GS
OG	*Xanthorrhoea arborea*	N	3	24	GS
		TOTAL	3.02	3	

PLOT 4

BAM Field Survey Form	Sheet 1 of 2

		Survey Name	Zone ID	Recorders		
Date	15.12.23	113 Orchard St	4	BT, GDB		
Zone		Datum	Plot ID	4	Plot Dimensions	20*20, 20* 50
56			IBRA Region	Sydney Basin	Midline bearing 0 m	101
Easting		Northing				
340995		6270928				
Vegetation Class		North Coast Wet Sclerophyll Forests				
Plant Community Type		Sydney Enriched Sandstone Moist Forest				

BAM Attribute 1000 sqm plot

Tree Strems Count

<5 cm	5-9 cm	10-19 cm	20-29 cm	30-49 cm	50-79 cm	80+ cm
N	Y	Y	Y	Y	Y	1

Litter cover %

5 m	15 m	25 m	35 m	45 m	Average
60	80	100	50	20	62

Length of logs (m)	7
# Hollows	1

PLOT 4

Sheet 2 of 2		Survey Name	Plot ID	Recorders
Date	15.12.23	113 Orchard St	4	BT, GDB

GF Code	Species	N, E or HTW	Cover	Abund	Stratum
TG	*Angophora costata*	N	1	1	US
TG	*Glochidion ferdinandi*	N	1	1	US
TG	*Eucalyptus piperita*	N	5	1	US
TG	*Eucalyptus botryoides*	N	1	1	US
TG	*Angophora floribunda*	N	1	1	US
TG	*Syncarpia glomulifera*	N	1	1	MS
		TOTAL	10	6	
SG	*Breynia oblongifolia*	N	0.01	14	MS
		TOTAL	0.01	1	
GG	*Lomandra glauca*	N	0.01	1	GS
GG	*Themeda australis* (Kangaroo grass)	N	3	20	GS
GG	*Imperata cyclindrica*	N	0.01	20	GS
GG	*Entolasia marginata*	N	0.01	20	GS
		TOTAL	3.03	4	
FG	*Hydrocotyle peduncularis*	N	0.01	20	GS
FG	*Dianella caerulea*	N	0.01	17	GS
FG	*Pratia purpurascens*	N	0.01	18	GS
		TOTAL	0.03	3	
EG	-	-	-	-	-
		TOTAL	0	0	
OG	*Glycine clandestina*	N	0.01	7	GS
OG	*Stephania japonica*	N	0.01	1	GS
OG	*Hibbertia scandens*	N	0.01	7	GS
		TOTAL	0.03	3	

Appendix B – BAM Reports

BAM Credit Summary Report

Proposal Details

Assessment Id
00044845/BAAS17054/23/00045212

Proposal Name
113 Orchard St

BAM data last updated *
22/06/2023

Assessor Name
Kat Duchatel

Report Created
10/02/2024

BAM Data version *
61

Assessor Number
BAAS17054

BAM Case Status
Finalised

Date Finalised
10/02/2024

Assessment Revision
1

Assessment Type
Part 4 Developments (Small Area)

BOS entry trigger
BOS Threshold: Biodiversity Values Map and area clearing threshold

* 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.

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

Zone	Vegetation zone name	TEC name	Current Vegetation integrity score	Change in Vegetation integrity (loss / gain)	Area (ha)	Sensitivity to loss (Justification)	Species sensitivity to gain class	BC Act Listing status	EPBC Act listing status	Biodiversity risk weighting	Potential SAII	Ecosystem credits
Sydney Enriched Sandstone Moist Forest												
1	3176_VZ1	Not a TEC	24.9	20.0	0.14	PCT Cleared - 23%	High Sensitivity to Gain			1.50		1

2	3176_VZ2	Not a TEC	12.6	3.6	0.26	PCT Cleared - 23%	High Sensitivity to Gain			1.50		0
3	3176_VZ3	Not a TEC	11.9	7.3	0.41	PCT Cleared - 23%	High Sensitivity to Gain			1.50		0
											Subtotal	**1**
											Total	**1**

Species credits for threatened species

Vegetation zone name	Habitat condition (Vegetation Integrity)	Change in habitat condition	Area (ha)/Count (no. individuals)	Sensitivity to loss (Justification)	Sensitivity to gain (Justification)	BC Act Listing status	EPBC Act listing status	Potential SAII	Species credits
Lathamus discolor / Swift Parrot (Fauna)									
3176_VZ1	20.0	20.0	0.14	Environment Protection and Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Critically Endangered	True	2
3176_VZ2	3.6	3.6	0.26	Environment Protection and Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Critically Endangered	True	1

3176_VZ3	7.3	7.3	0.41	Environment Protection and Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Critically Endangered	True	2
								Subtotal	**5**

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id
00044845/BAAS17054/23/00045212

Proposal Name
113 Orchard St

BAM data last updated *
22/06/2023

Assessor Name
Kat Duchatel

Assessor Number
BAAS17054

BAM Data version *
61

Proponent Names
Jill Hunter

Report Created
10/02/2024

BAM Case Status
Finalised

Assessment Revision
1

Assessment Type
Part 4 Developments (Small Area)

Date Finalised
10/02/2024

BOS entry trigger
BOS Threshold: Biodiversity Values Map and area clearing threshold

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Potential Serious and Irreversible Impacts

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

Species
Lathamus discolor / Swift Parrot

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
3176-Sydney Enriched Sandstone Moist Forest	Not a TEC	0.8	1	0	1

3176-Sydney Enriched Sandstone Moist Forest	**Like-for-like credit retirement options**					
	Class	Trading group	Zone	HBT	Credits	IBRA region

	North Coast Wet Sclerophyll Forests This includes PCT's: 487, 613, 1563, 1575, 3058, 3060, 3067, 3073, 3078, 3084, 3087, 3088, 3102, 3125, 3136, 3137, 3138, 3139, 3140, 3141, 3142, 3145, 3147, 3148, 3149, 3150, 3153, 3154, 3156, 3157, 3158, 3160, 3161, 3162, 3163, 3164, 3165, 3166, 3168, 3169, 3171, 3172, 3173, 3174, 3176, 3177, 3178, 3180, 4043, 4115	North Coast Wet Sclerophyll Forests <50%	3176_VZ1	Yes	1	Pittwater, Cumberland, Sydney Cataract, Wyong and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	North Coast Wet Sclerophyll Forests This includes PCT's: 487, 613, 1563, 1575, 3058, 3060, 3067, 3073, 3078, 3084, 3087, 3088, 3102, 3125, 3136, 3137, 3138, 3139, 3140, 3141, 3142, 3145, 3147, 3148, 3149, 3150, 3153, 3154, 3156, 3157, 3158, 3160, 3161, 3162, 3163, 3164, 3165, 3166, 3168, 3169, 3171, 3172, 3173, 3174, 3176, 3177, 3178, 3180, 4043, 4115	North Coast Wet Sclerophyll Forests <50%	3176_VZ2	Yes	0	Pittwater, Cumberland, Sydney Cataract, Wyong and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	North Coast Wet Sclerophyll Forests This includes PCT's: 487, 613, 1563, 1575, 3058, 3060, 3067, 3073, 3078, 3084, 3087, 3088, 3102, 3125, 3136, 3137, 3138, 3139, 3140, 3141, 3142, 3145, 3147, 3148, 3149, 3150, 3153, 3154, 3156, 3157, 3158, 3160, 3161, 3162, 3163, 3164, 3165, 3166, 3168, 3169, 3171, 3172, 3173, 3174, 3176, 3177, 3178, 3180, 4043, 4115	North Coast Wet Sclerophyll Forests <50%	3176_VZ3	No	0	Pittwater, Cumberland, Sydney Cataract, Wyong and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

Species	Vegetation Zone/s	Area / Count	Credits
Lathamus discolor / Swift Parrot	**3176_VZ1, 3176_VZ2, 3176_VZ3**	0.8	5.00

Like-for-like credit retirement options

Credit Retirement Options

Lathamus discolor / Swift Parrot	Spp	IBRA subregion
	Lathamus discolor / Swift Parrot	Any in NSW

BAM Predicted Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00044845/BAAS17054/23/00045212	113 Orchard St	22/06/2023
Assessor Name	Report Created	BAM Data version *
Kat Duchatel	10/02/2024	61
Assessor Number	Assessment Type	BAM Case Status
BAAS17054	Part 4 Developments (Small Area)	Finalised
Assessment Revision	BOS entry trigger	Date Finalised
1	BOS Threshold: Biodiversity Values Map and area clearing threshold	10/02/2024

* 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.

Threatened species reliably predicted to utilise the site. No surveys are required for these species. Ecosystem credits apply to these species.

Common Name	Scientific Name	Vegetation Types(s)
Barking Owl	Ninox connivens	3176-Sydney Enriched Sandstone Moist Forest
Black Bittern	Ixobrychus flavicollis	3176-Sydney Enriched Sandstone Moist Forest
Brown Treecreeper (eastern subspecies)	Climacteris picumnus victoriae	3176-Sydney Enriched Sandstone Moist Forest
Dusky Woodswallow	Artamus cyanopterus cyanopterus	3176-Sydney Enriched Sandstone Moist Forest
Eastern Coastal Free-tailed Bat	Micronomus norfolkensis	3176-Sydney Enriched Sandstone Moist Forest
Flame Robin	Petroica phoenicea	3176-Sydney Enriched Sandstone Moist Forest
Gang-gang Cockatoo	Callocephalon fimbriatum	3176-Sydney Enriched Sandstone Moist Forest
Glossy Black-Cockatoo	Calyptorhynchus lathami	3176-Sydney Enriched Sandstone Moist Forest
Grey-headed Flying-fox	Pteropus poliocephalus	3176-Sydney Enriched Sandstone Moist Forest
Large Bent-winged Bat	Miniopterus orianae oceanensis	3176-Sydney Enriched Sandstone Moist Forest

Little Bent-winged Bat	Miniopterus australis	3176-Sydney Enriched Sandstone Moist Forest
Little Eagle	Hieraaetus morphnoides	3176-Sydney Enriched Sandstone Moist Forest
Little Lorikeet	Glossopsitta pusilla	3176-Sydney Enriched Sandstone Moist Forest
Masked Owl	Tyto novaehollandiae	3176-Sydney Enriched Sandstone Moist Forest
Powerful Owl	Ninox strenua	3176-Sydney Enriched Sandstone Moist Forest
Rosenberg's Goanna	Varanus rosenbergi	3176-Sydney Enriched Sandstone Moist Forest
Spotted-tailed Quoll	Dasyurus maculatus	3176-Sydney Enriched Sandstone Moist Forest
Square-tailed Kite	Lophoictinia isura	3176-Sydney Enriched Sandstone Moist Forest
Swift Parrot	Lathamus discolor	3176-Sydney Enriched Sandstone Moist Forest
Varied Sittella	Daphoenositta chrysoptera	3176-Sydney Enriched Sandstone Moist Forest
White-bellied Sea-Eagle	Haliaeetus leucogaster	3176-Sydney Enriched Sandstone Moist Forest
White-throated Needletail	Hirundapus caudacutus	3176-Sydney Enriched Sandstone Moist Forest
Yellow-bellied Sheathtail-bat	Saccolaimus flaviventris	3176-Sydney Enriched Sandstone Moist Forest

Threatened species Manually Added

None added

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Refer to BAR for detailed justification

Common Name	Scientific Name	Justification in the BAM-C

BAM Candidate Species Report

Proposal Details

Assessment Id 00044845/BAAS17054/23/00045212	Proposal Name 113 Orchard St	BAM data last updated * 22/06/2023
Assessor Name Kat Duchatel	Report Created 10/02/2024	BAM Data version * 61
Assessor Number BAAS17054	Assessment Type Part 4 Developments (Small Area)	BAM Case Status Finalised
Assessment Revision 1	Date Finalised 10/02/2024	BOS entry trigger BOS Threshold: Biodiversity Values Map and area clearing threshold

* 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.

List of Species Requiring Survey

Name	Presence	Survey Months
Camarophyllopsis kearneyi Camarophyllopsis kearneyi	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☑ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Chalinolobus dwyeri Large-eared Pied Bat	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?

Deyeuxia appressa Deyeuxia appressa	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☑ Dec ☐ Survey month outside the specified months?
Diuris bracteata Diuris bracteata	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☑ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Hygrocybe anomala var. ianthinomarginata Hygrocybe anomala var. ianthinomarginata	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☑ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Hygrocybe aurantipes Hygrocybe aurantipes	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☑ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Hygrocybe austropratensis Hygrocybe austropratensis	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☑ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Hygrocybe collucera Hygrocybe collucera	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☑ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Hygrocybe griseoramosa Hygrocybe griseoramosa	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☑ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Hygrocybe lanecovensis Hygrocybe lanecovensis	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☑ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Hygrocybe reesiae Hygrocybe reesiae	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☑ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Hygrocybe rubronivea Hygrocybe rubronivea	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☑ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Lathamus discolor Swift Parrot	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Prostanthera marifolia Seaforth Mintbush	No (surveyed)	☑ Jan ☑ Feb ☐ Mar ☑ Apr ☐ May ☑ Jun ☐ Jul ☐ Aug ☑ Sep ☑ Oct ☑ Nov ☑ Dec ☐ Survey month outside the specified months?

Rhizanthella slateri Eastern Australian Underground Orchid	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☑ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Rhodamnia rubescens Scrub Turpentine	No (surveyed)	☑ Jan ☑ Feb ☐ Mar ☐ Apr ☐ May ☑ Jun ☐ Jul ☐ Aug ☑ Sep ☑ Oct ☑ Nov ☑ Dec ☐ Survey month outside the specified months?

Threatened species Manually Added

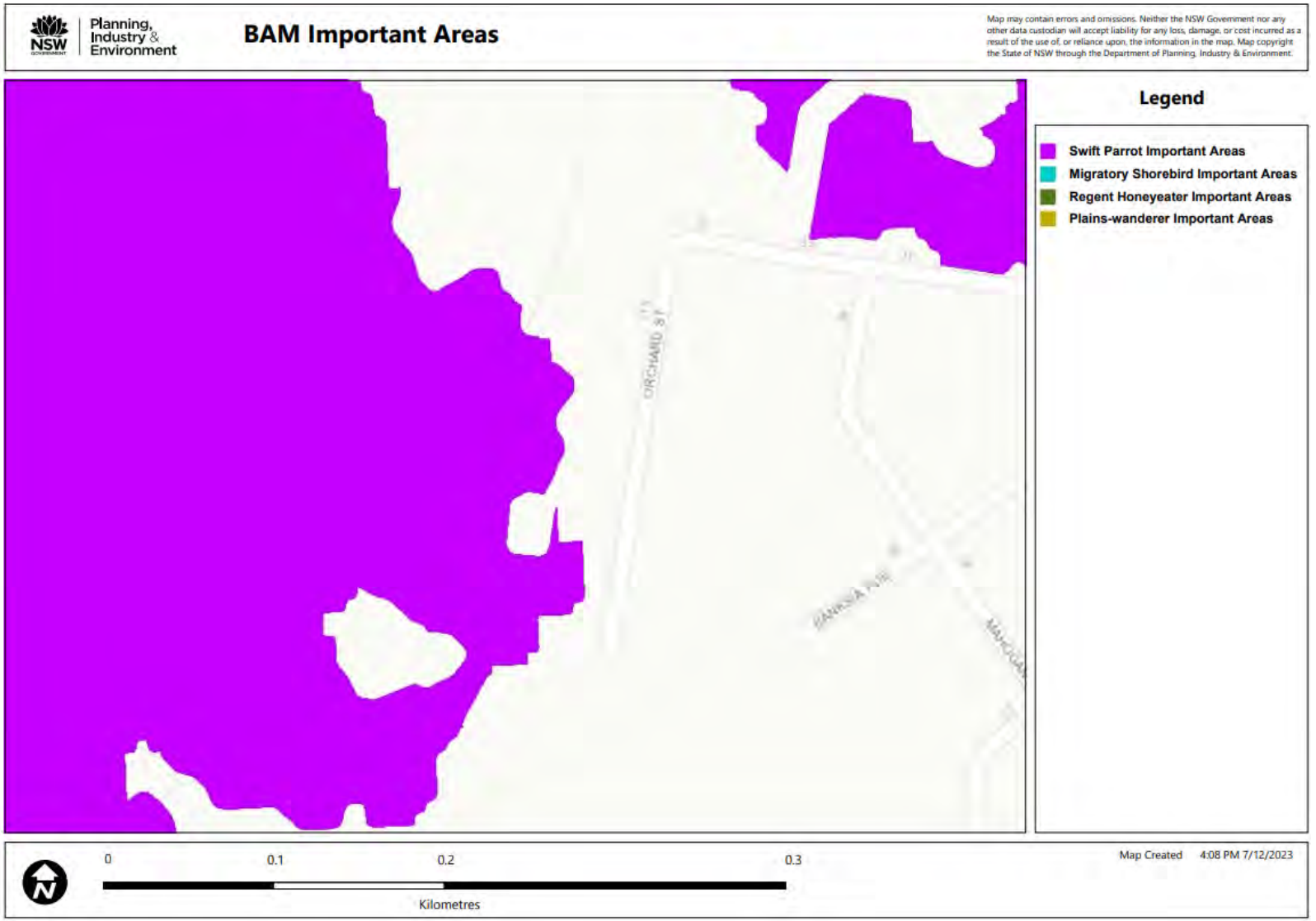
None added

Threatened species assessed as not on site

Refer to BAR for detailed justification

Common name	Scientific name	Justification in the BAM-C
Large Bent-winged Bat	Miniopterus orianae oceanensis	Habitat constraints
Little Bent-winged Bat	Miniopterus australis	Habitat constraints

Appendix C – BAM Important Habitat Map



Appendix D – EPBC Act Considerations

Overview

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the Australian Government's central piece of environmental legislation. The EPBC Act provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places—defined in the EPBC Act as matters of national environmental significance.

For matters of national environmental significance under the EPBC Act, significance assessments have been completed in accordance with the *EPBC Act Policy Statement 1.1 Significant Impact Guidelines* (Department of Environment, 2013).

Whether or not an action is likely to have a significant impact depends upon the sensitivity, value, and quality of the environment that is affected, and upon the intensity, duration, magnitude and geographic extent of the impacts (Department of Environment, 2013). Importantly, for a 'significant impact' to be 'likely', it is not necessary for a significant impact to have a greater than 50% chance of happening; it is sufficient if a significant impact on the environment is a real or not remote chance or possibility (Department of Environment, 2013).

What are matters of national environmental significance?

The matters of national environmental significance are:

- world heritage properties
- national heritage places
- wetlands of international importance (often called 'Ramsar' wetlands after the international treaty under which such wetlands are listed)
- nationally threatened species and ecological communities
- migratory species
- Commonwealth marine areas
- the Great Barrier Reef Marine Park
- nuclear actions (including uranium mining)
- a water resource, in relation to coal seam gas development and large coal mining development.

Source: Matters of National Environmental Significance Significant impact guidelines 1.1
https://www.dcceew.gov.au/sites/default/files/documents/nes-guidelines_1.pdf

Relevant Matters

A search of the Protected Matters Search Tool (PMST) revealed that 1 national heritage place, 109 threatened species, 61 migratory species (and/or their habitats) and 8 threatened ecological communities listed in the EPBC Act are predicted to occur within a 5 km radius of the subject land.

No EPBC Act listed national heritage places occur on the subject land.

Threatened species listed under the EPBC Act relevant to the subject land include the Swift Parrot, Large-eared Pied Bat, and Grey-headed Flying-Fox.

No EPBC Act listed migratory species were recorded on the subject land nor does the subject land contain habitat for migratory species.

No EPBC Act listed threatened ecological communities were recorded on the subject land and no other EPBC Act matters are relevant to the biodiversity of the subject land.

Significant Impact Assessment

The Swift Parrot, Large-eared Pied Bat, and Grey-headed Flying-Fox have been considered in accordance with the 'significant impact criteria' for 'vulnerable' and 'endangered' species in the *Matters of National Environmental Significance Significant Impact Guidelines 1.1* (DoE 2013).

When taking into consideration all stages and components of the proposal, there is the potential for impacts, including indirect impacts, on matters of national environmental significance, being mainly loss of a potential foraging habitat for mobile threatened fauna species, including birds, bats and mammals. However, it is unlikely that any of the species would be adversely impacted by the proposal, given:

- Breeding habitat for the Swift Parrot is not present on the subject land. This species breeds in Tasmania and migrates to mainland Australia to forage. Foraging habitat for the species is present on the subject land in the form of *C. gummifera* (Red bloodwood) trees. The proposal does not require the clearing of foraging habitat of the Swift Parrot. The proposal is not expected to impact the Swift Parrot.
- Optimal breeding habitat for the Large-eared Pied Bat is not present on the subject land. The species primarily roosts in caves. Foraging habitat for the species is present on the subject land in the form of canopy cover and insect abundance. The proposal requires the clearing of 35 trees of potential foraging habitat for the species. The affected area of foraging habitat would represent a small percentage of the total extent of foraging vegetation types present within the locality. Given the relatively widespread nature of similar vegetation and abundance of higher quality foraging habitat within the locality, the proposal is not expected to significantly affect the life cycle of the species.
- No flying-fox camps occur on the subject land and the proposal would not impact on any camp. As such, the impacts of the proposal to the Grey-headed Flying-fox would be limited to the loss of foraging habitat caused by direct clearing of trees during the construction phase. The proposal would remove 35 trees of potential foraging habitat. The affected area of foraging habitat would represent a small percentage of the total extent of foraging vegetation types present within the locality. Given the relatively widespread nature of similar vegetation and abundance of higher quality foraging habitat within the locality, the proposal is not expected to significantly affect the life cycle of the species.

With reference to the criteria for vulnerable and endangered species, the proposal is not likely to:

- lead to a long-term decrease in the size of a population
- reduce the area of occupancy of the species
- fragment an existing population into two or more populations
- adversely affect habitat critical to the survival of a species
- disrupt the breeding cycle of a population
- modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species are likely to decline

- result in invasive species that are harmful to a critically endangered or endangered species becoming
- established in the endangered or critically endangered species' habitat
- introduce disease that may cause the species to decline, or
- interfere with the recovery of the species.

Conclusion

It is not likely that the proposal would have a significant impact on any matters of national environmental significance listed under the EPBC Act. Referral of the development application to the Commonwealth Department of Climate Change, Energy, the Environment and Water is not warranted.

Appendix E – APZ Requirements

A4.1.1 Inner Protection Areas (IPAs)

The IPA is the area closest to the building and creates a fuel-managed area which can minimise the impact of direct flame contact and radiant heat on the development and act as a defendable space. Vegetation within the IPA should be kept to a minimum level. Litter fuels within the IPA should be kept below 1cm in height and be discontinuous.

In practical terms the IPA is typically the curtilage around the building, consisting of a mown lawn and well maintained gardens.

When establishing and maintaining an IPA the following requirements apply:

Trees

- tree canopy cover should be less than 15% at maturity;
- trees at maturity should not touch or overhang the building;
- lower limbs should be removed up to a height of 2m above the ground;
- tree canopies should be separated by 2 to 5m; and
- preference should be given to smooth barked and evergreen trees.

Shrubs

- create large discontinuities or gaps in the vegetation to slow down or break the progress of fire towards buildings should be provided;
- shrubs should not be located under trees;
- shrubs should not form more than 10% ground cover; and
- clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.

Grass

- grass should be kept mown (as a guide grass should be kept to no more than 100mm in height); and
- leaves and vegetation debris should be removed.

A4.1.2 Outer Protection Areas (OPAs)

An OPA is located between the IPA and the unmanaged vegetation. It is an area where there is maintenance of the understorey and some separation in the canopy. The reduction of fuel in this area aims to decrease the intensity of an approaching fire and restricts the potential for fire spread from crowns; reducing the level of direct flame, radiant heat and ember attack on the IPA.

Because of the nature of an OPA, they are only applicable in forest vegetation.

When establishing and maintaining an OPA the following requirements apply:

Trees

- tree canopy cover should be less than 30%; and
- canopies should be separated by 2 to 5m.

Shrubs

- shrubs should not form a continuous canopy; and
- shrubs should form no more than 20% of ground cover.

Grass

- grass should be kept mown to a height of less than 100mm; and
- leaf and other debris should be removed.

An APZ should be maintained in perpetuity to ensure ongoing protection from the impact of bush fires. Maintenance of the IPA and OPA as described above should be undertaken regularly, particularly in advance of the bush fire season.

Source: Planning for Bushfire Protection 2019. NSW Rural Fire Service.

Appendix F – Natural Environment Referral Response

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Natural Environment Referral Response - Biodiversity

Application Number:	DA2023/1127
Proposed Development:	Demolition works and construction of a dwelling house, horse arena, stables and paddocks
Date:	25/09/2023
Responsible Officer	Phil Lane
Land to be developed (Address):	Lot 6 DP 749791 , 113 Orchard Street WARRIEWOOD NSW 2102

Reasons for referral

This application seeks consent development on land, or within 40m of land, containing:

- All Development Applications on
- Actual or potential threatened species, populations, ecological communities, or their habitats;
- Wildlife corridors;
- Vegetation query stipulating that a Flora and Fauna Assessment is required;
- Vegetation query - X type located in both A & C Wards;

And as such, Council's Natural Environment Unit officers are required to consider the likely potential environmental impacts.

Officer comments

Additional information is required in order to determine compliance with relevant biodiversity provisions, including entry thresholds for the NSW Biodiversity Offsets Scheme.

The Development Application seeks consent for demolition works and construction of a dwelling house, horse arena, stables and paddocks.

Council's Biodiversity referrals team have assessed the Development Application for compliance against the following applicable provisions:

- NSW Biodiversity Conservation Act 2016
- NSW Biodiversity Conservation Regulation 2017
- Pittwater LEP 2014 cl. 7.6 Biodiversity Protection
- Pittwater 21 DCP cl. B4.18 Heathland/Woodland Vegetation
- Planning for Bushfire Protection 2019

A Flora and Fauna Assessment (FFA) (Kingfisher Urban Ecology and Wetlands March 2023) was submitted with the application which identifies that the proposal does not trigger the Biodiversity Offset Scheme (BOS) as native vegetation clearing within the site does not exceed the applicable clearing threshold (0.5ha). As per advice from the Department of Planning and Environment (DPE) on the 19th September 2023, future 10/50 clearing code entitlements must be included in the proposed development footprint assessment when determining the application of the BOS. As such, relevant maps and area calculations within the FFA are to be amended to include all potential impacts to native

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vegetation including development footprint, future 10/50 clearing entitlement associated with the new dwelling, APZs and associated services and infrastructure. It should also be noted that the current 10/50 clearing entitlement associated with the existing dwelling will be extinguished upon demolition of the building. Any vegetation clearing within the existing 10/50 clearing entitlement should be considered if it falls within the development footprint of the new proposed development.

As requested by Council's Biodiversity Officer in the Pre-Lodgement Meeting held between the applicant and Council on 1 March 2022, the FFA must assess compliance against the objectives of applicable LEP and DCP controls. This has not been addressed within the report and as such must be amended to demonstrate whether the proposal is compliant with the relevant controls, in particular:

- The development is designed, sited and will be managed to avoid any significant adverse environmental impact (PLEP cl. 7.6)
- Development shall retain and enhance habitat and wildlife corridors for threatened species, endangered populations, endangered ecological communities and other locally native species (DCP cl. B4.18)
- Development shall not reduce or degrade habitat for locally native species, threatened species, endangered populations or endangered ecological communities (DCP cl. B4.18)

Additionally, the FFA is to be amended to include tree removal as per the most recent Arborist Report (07 April 2023) for consistency across the application.

The Bushfire Consultant and Arborist are to confirm if tree removal is required in addition to the 35 trees proposed for removal in order for the APZ to meet the minimum requirements of Planning for Bushfire Protection. Additional tree removal may not be supported.

In accordance with relevant reporting requirements set out in PDCP cl. B4.18, the applicant is also required to engage a suitably qualified Ecologist to prepare a Biodiversity Management Plan (BMP) to assist in the protection and management of important native vegetation and fauna habitat within the site. The BMP is to be prepared sympathetic to the current vegetation on site and must not include onerous planting, rather the necessary planting required to replace native prescribed trees removed as a result of the development. It is noted that Council's Biodiversity Officer conducted a site visit and confirmed the understory to be sparse, however largely native with few weed infestations, mostly occurring close to the boundaries of the property. During the site inspection, a hollow was being occupied by a native glider within Tree 113. This tree is to be retained and protected. Bunting is to be used to fence off the tree during development to ensure that the tree is not disturbed. The BMP should outline installation of appropriate fauna nest boxes within the site.

Upon receipt of additional information, Council's Biodiversity Referrals team will recommence assessment of the application against applicable controls.

The proposal is therefore unsupported.

Note: Should you have any concerns with the referral comments above, please discuss these with the Responsible Officer.

Recommended Natural Environment Conditions:

Nil.

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Appendix G – Compliance with Minimum Information Requirements for the BDAR

Minimum information requirements for the Biodiversity Development Assessment Report: Streamlined assessment module – Small area

Report section	BAM ref.	Information	Maps & tables (in document)	Data (to be supplied)	BDAR ref.
Introduction	Chapters 2 and 3	**INFORMATION** Introduction to the biodiversity assessment including: ☐ brief description of proposed development ☐ identification of subject land boundary, including: ☐ operational footprint ☐ construction footprint indicating clearing associated with temporary/ancillary construction facilities and infrastructure ☐ general description of the subject land ☐ Sources of information used in the assessment, including reports and spatial data ☐ Identification of assessment method applied (i.e. linear or site-based)			Section 1
		MAPS and TABLES (in document) ☐ Map of the subject land boundary showing the final proposal footprint, including the construction footprint for any clearing associated with temporary/ancillary construction facilities and infrastructure (if BDAR)			Section 1
		DATA (to be supplied) – N/A			
Landscape	Section 3.1 and 3.2, Appendix E	**INFORMATION** Identification of site context components and landscape features at the proposed site, including: ☐ general description of subject land topographic and hydrological setting, geology and soils ☐ percent native vegetation cover in the assessment area (as described in BAM Subsection 3.2 (4 .) ☐ IBRA bioregions and subregions (as described in BAM Subsection 3.1.3 (2 .)) Other relevant landscape features which may include:			Section 2

Report section	BAM ref.	Information	Maps & tables (in document)	Data (to be supplied)	BDAR ref.
		☐ rivers and streams classified according to stream order (as described in BAM Subsection 3.1.3 (3 –4.) and Appendix E) ☐ wetlands within, adjacent to and downstream of the site (as described in BAM Subsection 3.1.3 (4 .)) ☐ connectivity of different areas of habitat (as described in BAM Subsection 3.1.3 (5 –6 .)) ☐ areas of geological significance and soil hazard features (as described in BAM Subsections 3.1.3 (7.) and 3.1.3 (10 .) ☐ areas of outstanding biodiversity value occurring on the subject land and assessment area (as described in BAM Subsection 3.1.3 (8 –9 .))			
		MAPS and TABLES (in document) ☐ Site Map ☐ boundary of subject land ☐ cadastre of subject land ☐ landscape features identified in BAM Subsection 3.1.3 ☐ areas of outstanding biodiversity value within the subject land ☐ Location Map ☐ digital aerial photography at 1:1,000 scale or finer ☐ boundary of subject land ☐ 1500 m buffer area *or* 500 m buffer for linear development ☐ landscape features identified in BAM Subsection 3.1.3 ☐ additional detail (e.g. local government area boundaries) relevant at this scale ☐ areas of outstanding biodiversity value within the assessment area Landscape features identified in BAM Subsection 3.1.3 and to be shown on the Site Map and/or Location map include: ☐ IBRA bioregions and subregions			Section 2

Report section	BAM ref.	Information	Maps & tables (in document)	Data (to be supplied)	BDAR ref.
		☐ rivers, streams and estuaries ☐ wetlands and important wetlands ☐ connectivity of different areas of habitat ☐ areas of geological significance and soil hazard features			
		DATA (to be supplied) ☐ All report maps as separate jpeg files Individual digital shape files of: ☐ subject land boundary ☐ assessment area (i.e. buffer area) boundary ☐ cadastral boundary of subject land ☐ areas of native vegetation cover ☐ areas of habitat connectivity			Uploaded to BOAMs
Native vegetation, TECs and vegetation integrity	Chapter 4	**INFORMATION** ☐ Patch size (in accordance with BAM Subsection 4.3.2) ☐ Identification of the dominant PCT on the subject land and extent (ha) with justification of method used (existing information or plot-based survey data) ☐ Identification of any TEC associated with the PCT (BAM Subsection 4.2.2) ☐ Estimate of percent cleared value of dominant PCT (BAM Subsection 4.2.1 (5 .) ☐ Identification of any TEC on site that is not associated with the dominant PCT (Note: This TEC is required to be assessed and offset.) ☐ Equivalence with mapping units of previous vegetation maps reviewed as part of the assessment (i.e. equivalent mapping units) ☐ Vegetation integrity of the PCT(s) on the subject land as individual vegetation zones ☐			Section 3

Report section	BAM ref.	Information	Maps & tables (in document)	Data (to be supplied)	BDAR ref.
		☐ Justification for how this was determined (i.e. qualitatively by observing values for the condition attributes set out in Table 2 of the BAM or quantitatively by collecting field data for the condition attributes at a plot in accordance with BAM Subsection 4.3.4) ☐ Use of relevant benchmark data from BioNet Vegetation Classification (as described in BAM Subsections 4.3.3 (5 .)) Where use of more appropriate local benchmark data is proposed (as described in BAM Subsection 1.4.2, BAM Subsection 4.3.3(5.) and BAM Appendix A): ☐ identify the PCT or vegetation class for which local benchmark data will be applied ☐ identify published sources of local benchmark data (if benchmarks obtained from published sources) ☐ describe methods of local benchmark data collection (if reference plots used to determine local benchmark data) ☐ provide justification for use of local data rather than BioNet Vegetation Classification benchmark values			
		MAPS and TABLES (in document) ☐ Map of native vegetation extent for the subject land (as described in BAM Section 3.1) ☐ Map of PCT/vegetation zones within the subject land (as described in BAM Section 4.2 (1 .) ☐ Map the location of floristic vegetation survey plots and vegetation integrity survey plots relative to PCT boundaries ☐ Map of TEC distribution on the subject land ☐ Patch size of native vegetation (as described in BAM Subsection 4.3.2) Table of current vegetation integrity scores for vegetation zone within the site including: ☐ composition condition score ☐ structure condition score ☐ function condition score			Section 3

Report section	BAM ref.	Information	Maps & tables (in document)	Data (to be supplied)	BDAR ref.
		☐ Report from BAM-C (Small area module) including vegetation integrity scores (BAM Section 4.4)			
		DATA (to be supplied) ☐ All report maps as separate jpeg files ☐ Plot field data (MS Excel format) ☐ Digital shape files for all maps and spatial data ☐ Field data sheets (if relevant) for determining vegetation integrity (BAM Subsection 4.3.4)			Uploaded to BOAMs Appendix A
Habitat suitability for threatened species	Chapter 5 and Section 9.1	**INFORMATION** ☐ Describe the review of existing information and any field survey undertaken to assess habitat constraints and microhabitats for threatened species within the subject land ☐ Determination of the suite of threatened species likely to occur on or use the proposed site according to Steps 1 and 2 in BAM Section 5.2 including species to be assessed for ecosystem credits and the list of species to be assessed for species credits ☐ List of ecosystem credit species derived from the TBDC (as described in BAM Subsections 5.2.1 and 5.2.2) with justification for the exclusion of any ecosystem credit species based on habitat constraints (as described in BAM Subsection 5.2.2) ☐ Identification of candidate species credit species that are at risk of an SAII and therefore, must be further assessed (BAM Section 9.1) Note: Candidate species credit species that are not at risk of an SAII and not incidentally recorded on the subject land do not require further assessment. For candidate species credit species that are at risk of an SAII, a description of the species, any habitat constraints or microhabitats associated with the species on the subject land and information used to create the species polygon/s in accordance with Steps 3 to 5 of BAM Section 5.2 including: ☐ justification for determining that a candidate species credit species at risk of an SAII is unlikely to have suitable habitat on the subject land or specific vegetation zone (based on a field assessment of the subject land and published literature or an expert report prepared in accordance with Box 3 of the BAM)			Section 4

Report section	BAM ref.	Information	Maps & tables (in document)	Data (to be supplied)	BDAR ref.
		☐ determination of the presence of remaining candidate species credit species at risk of an SAII (by assuming presence, conducting a threatened species survey or an expert report). Note: If the subject land is mapped on an important habitat map for a species, or for a component of its habitat, the subject land is considered to have suitable habitat for the species to be present. ☐ species polygons identifying the location and area of suitable habitat for each candidate threatened species at risk of an SAII that is recorded on the subject land and is measured by area, OR ☐ species polygons identifying the area of suitable habitat and targeted surveys identifying the count and location of individuals on the subject land for each candidate threatened flora species at risk of an SAII that is recorded on the subject land and is measured by count ☐ species polygons for each threatened species identified on the subject land that is not at risk of an SAII (i.e. incidentally observed during site visit) ☐ Determination of habitat condition within species polygon/s for each threatened species (measured by area) at risk of an SAII or incidentally observed during the site visit (Step 6 of BAM Section 5.2) ☐ For flora species credit species at risk of an SAII or incidentally observed during site visit, provide a count, or an estimation, of the number of individual plants present on the subject land (as described in BAM Subsection 5.2.5 (4 .))			
		MAPS and TABLES (in document) ☐ Table showing ecosystem credit species in accordance with BAM Subsection 5.1.1 , and: ☐ identifying any ecosystem credit species removed from the list of species on the basis of further assessment in accordance with BAM Subsections 5.2.2 and 5.2.3 ☐ identifying the sensitivity to gain class of each species (BAM Section 5.4) ☐ Table detailing species credit species within the subject land at risk of an SAII (BAM Section 9.1) or incidentally observed during the site visit including any associated habitat feature/components and its abundance (flora)/extent of habitat (flora and fauna) and biodiversity risk weighting (BAM Sections 5.2 –5.4) ☐ Map of species credit species records within the subject land and species polygons for flora and fauna species at risk of an SAII or incidentally observed during the site visit (as described in BAM Subsection 5.2.5 (1 –7 .))			Section 4

Report section	BAM ref.	Information	Maps & tables (in document)	Data (to be supplied)	BDAR ref.
		DATA (to be supplied) ☐ Digital shape files of species polygons ☐ Species polygon map in jpeg format ☐ Expert reports and any supporting data used to support conclusions of the expert report ☐ Field data sheets (if relevant) for threatened species surveys			Uploaded to BOAMs
Prescribed impacts	Chapter 6	**INFORMATION** ☐ Any prescribed impacts from the small area proposal must be set out in the BDAR consistent with Appendix K			Section 5
		MAPS AND TABLES (in document) ☐ If relevant, maps showing location of any prescribed impact features (i.e. karst, caves, crevices, cliffs, rocks, human-made structures, etc.)			Section 5
		DATA (to be supplied) ☐ If relevant, digital shape files of prescribed impact feature locations ☐ Prescribed impact features map in jpeg format			Uploaded to BOAMs
Avoid and minimise impacts	Chapter 7	**INFORMATION** Demonstration of efforts to avoid and minimise impacts on biodiversity values (including prescribed impacts) associated with the proposal location in accordance with Chapter 7, including an analysis of alternative: ☐ modes or technologies that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed mode or technology ☐ alternative locations that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed location ☐ alternative sites within a property on which the proposal is located that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed site			Section 6

Report section	BAM ref.	Information	Maps & tables (in document)	Data (to be supplied)	BDAR ref.
		☐ Describe efforts to avoid and minimise impacts (including prescribed impacts) to biodiversity values through proposal design (as described in BAM Subsections 7.1.2 and 7.2.2 ☐ Identification of any other site constraints that the proponent has considered in determining the location and design of the proposal (as described in BAM Subsection 7.2.1 (3 .)			
		MAPS and TABLES (in document) ☐ Table of measures to be implemented before, during and after construction to avoid and minimise the impacts of the proposal, including action, outcome, timing and responsibility ☐ Map of final proposal footprint, including construction and operation ☐ Maps demonstrating indirect impact zones where applicable			Section 10
		DATA (to be supplied) Digital shape files of: ☐ final proposal footprint ☐ direct and indirect impact zones ☐ Maps in jpeg format			Uploaded to BOAMs
Assessment of impacts	Chapter 8, Section 8.1 and 8.2	**INFORMATION** Determine the impacts on native vegetation and threatened species habitat, including: ☐ description of direct impacts of clearing of native vegetation, threatened ecological communities and threatened species habitat (as described in BAM Sections 8.1) ☐ description of the nature, extent, frequency, duration and timing of indirect impacts of the proposal (as described in BAM Subsection 8.2 ☐ Any prescribed impacts from the small area proposal must be set out in the BDAR consistent with Appendix K			Section 7
		MAPS and TABLES (in document)			Section 7

Report section	BAM ref.	Information	Maps & tables (in document)	Data (to be supplied)	BDAR ref.
		☐ Table showing change in vegetation integrity score for each vegetation zone as a result of identified impacts			
		DATA (to be supplied) – N/A			
Mitigation and management of impacts	Chapter 8, Section 8.4 and 8.5	**INFORMATION** Identification of measures to mitigate or manage impacts in accordance with the recommendations in BAM Subsections 8.4.1 and 8.4.2, including (as described in BAM Subsection 8.4.1(2.): ☐ techniques, timing, frequency and responsibility ☐ identify measures for which there is risk of failure ☐ evaluate the risk and consequence of any residual impacts ☐ document any adaptive management strategy proposed Identification of measures for mitigating impacts related to: ☐ displacement of resident fauna (as described in BAM Subsection 8.4.1) ☐ indirect impacts on native vegetation and habitat (as described in BAM Subsection 8.4.1 (3 .)) ☐ mitigating prescribed biodiversity impacts (as described in BAM Subsection 8.4.2) ☐ Details of the adaptive management strategy proposed to monitor and respond to impacts on biodiversity values that are uncertain (BAM Section 8.5)			Section 10
		MAPS and TABLES (in document) ☐ Table of measures to be implemented before, during and after construction to mitigate and manage impacts of the proposal, including action, outcome, timing and responsibility			Section 10
		DATA (to be supplied) – N/A			
Thresholds for assessing and	Chapter 9	**INFORMATION** ☐ Information from the TBDC and/or other sources to report on the current status of threatened species, threatened populations at risk of an SAII and TEC/s for the proposal, and			Section 9

Report section	BAM ref.	Information	Maps & tables (in document)	Data (to be supplied)	BDAR ref.
offsetting impacts of the proposal		☐ Report on impacts of the proposal on TEC/s in accordance with BAM Subsection 9.2.1 ☐ Report on impacts of the proposal on threatened species and/or threatened populations at risk of an SAII in accordance with BAM Section 9.1 ☐ Identification of impacts requiring offset in accordance with BAM Section 9.2 ☐ Identification of impacts not requiring offset in accordance with BAM Subsection 9.2.1 (3 .) ☐ Identification of areas not requiring assessment in accordance with BAM Section 9.3			
		MAPS and TABLES (in document) ☐ Map showing the extent of TECs at risk of an SAII within the subject land ☐ Map showing the location of threatened species at risk of an SAII within the subject land Map showing location of: ☐ impacts requiring offset ☐ impacts not requiring offset ☐ areas not requiring assessment			Appendix 9
		DATA (to be supplied) Digital shape files of: ☐ extent of TECs at risk of an SAII within the subject land ☐ threatened species at risk of an SAII within the subject land ☐ boundary of impacts requiring offset ☐ boundary of impacts not requiring offset ☐ boundary of areas not requiring assessment ☐ Maps in jpeg format			Uploaded to BOAMS
	Chapter 10	**INFORMATION** ☐ Description of the impact on PCTs/TECs			Section 9

Report section	BAM ref.	Information	Maps & tables (in document)	Data (to be supplied)	BDAR ref.
Applying the no net less standard		☐ Description of the impact on threatened species at risk of an SAII or incidentally observed via site visit ☐ Number of ecosystem credits required for impacts on biodiversity values according to BAM Subsection 9 ☐ Number of species credits required for impacts on biodiversity values according to BAM Subsection 10.1.3, including any species credit species that has been incidentally observed on the subject land Note: Species credits for any species at risk of an SAII are calculated in the event that the decision-maker forms the opinion that the proposed impact is unlikely to be serious and irreversible and therefore can be offset. ☐ Identification of credit class for ecosystem credits and species credits according to BAM Section 10.2 (this can be generated from BAM-C)			
		MAPS and TABLES (in document) ☐ Table showing biodiversity risk weightings ☐ Table of BC Act listing status for PCTs and threatened species requiring offset ☐ Table of PCTs requiring offset and number of ecosystem credits required (Subsection 10.2.1) ☐ Table of species at risk of an SAII or incidentally observed on site assessed for species credits and the number of credits required ☐ BAM-C credit report			Section 9 Appendix B
		DATA (to be supplied) – N/A			

Expertise of Authors

Geraldene Dalby-Ball
DIRECTOR

With over 25 years wetland and urban ecology experience, a great passion for what she does, and extensive technical and on-ground knowledge make Geraldene a valuable contribution to any project.

Geraldene has over 8 years local government experience as manager of environment and education for Pittwater Council. Geraldene presented papers on the topic at the NSW Coastal Conference, Sydney CMA and Hawkesbury Nepean forums. Geraldene is a Technical Advisor Sydney Olympic Park Wetland Education and Training (WET) panel.

Geraldene has up to date knowledge of environmental policies and frequently provides input to such works. Geraldene was a key contributor to the recent set of Guidelines commissioned by Southeast Queensland Healthy Waterways Water Sensitive Urban Design Guidelines. Geraldene's role included significant contributions and review of the Guideline for Maintaining WSUD Assets and the Guideline for Rectifying WSUD Assets.

Geraldene is a frequent contributor to many community and professional workshops on ecological matters particularly relating to environmental management. She is an excellent Project Manager.

Geraldene is a joint author on the popular book Burnum Burnum's Wildthings published by Sainty and Associates. Author of the Saltmarsh Restoration Chapter Estuary Plants of East Coast Australia published by Sainty and Associates (2013). Geraldene's early work included 5 years with Wetland Expert Geoff Sainty of Sainty and Associates. Geraldene is an expert in creating and enhancing urban biodiversity habitat and linking People with Place.

SPECIALISATIONS

- Urban Ecology – and habitat rehabilitation and re-creation.
- Urban waterway management – assessing, designing and supervising rehabilitation works
- Saltmarsh and Wetland re-creation and restoration – assessment, design and monitoring
- Engaging others in the area of environmental care and connection
- Technical Advisor – environmental design, guidelines and policies
- Sound knowledge and practical application of experimental design and statistics
- Project management and supervision
- Grant writing and grant assessment
- Budget estimates and tender selection
- Expert witness in the Land and Environment Court

CAREER SUMMARY

- **Director and Ecologist**, Ecological Consultants Australia. 2014-*present*
- **Director and Ecologist**, Dragonfly Environmental. 1998-*present*
- **Manager** Natural Resources and Education, Pittwater Council 2002-2010
- **Wetland Ecologist** Sainty and Associates 1995-2002

QUALIFICATIONS AND MEMBERSHIPS

- **Bachelor of Science with 1st Class Honors**, Sydney University
- WorkCover WHS General Induction of Construction Industry NSW White Card.
- Senior First Aid Certificate.
- **Practicing member and vice president** Ecological Consultants Association of NSW

Brooke is a passionate and dedicated ecologist with valuable on ground experience working on bush regeneration projects throughout the Sydney Region. She has worked with various stakeholders across both public and private sectors to deliver sustainable and achievable environmental outcomes. She has worked on major construction contractors as well as smaller contractors to deliver tailored environmental solutions on time and within budget.

Brooke completed her Bachelor of Science at the University of Wollongong and is currently expanding her skills and knowledge undertaking Cert III in Conservation and Ecosystem Management at TAFE.

Brooke has experience conducting fieldwork and preparing a range of reports including the Flora and Fauna Assessment, Vegetation Management Plan (VMP), Biodiversity Development Assessment Report (BDAR), Certification Certification, Construction Environmental Management Plan (CEMP), Review of Environmental Factors (REF), and Environmental Impact Assessment (EIA).

Brooke has exceptional communication and customer service skills and can deliver professional ecological assessments.

Key Projects:

- Threatened species surveys.
- Flora and fauna surveys.
- Fauna spotter and handler.
- Aquatic fauna relocation.

Brooke Thompson
ECOLOGIST

SPECIALISATIONS

- GIS mapping
- Fauna spotting
- Aquatic fauna relocation and handling
- Habitat tree assessment, marking and mapping
- Floristic plot surveys
- Flora and fauna field surveys

CAREER SUMMARY

- **Ecologist**, Ecological Consultants Australia. June 2022-*present*
- **Natural Area Specialist**, Dragonfly Environmental. January 2022-*present*
- **Volunteer**, Microplastic Surveying, University of Wollongong 2021
- **Volunteer**, Frog Surveying, Chad Beranek B EnvSc (Hons) UTS 2016

QUALIFICATIONS AND MEMBERSHIPS

- **BSc Conservation Biology**, University of Wollongong.
- Currently undertaking Cert III Conservation and Ecosystem Management.
- WHS General Induction of Construction Industry NSW White Card.