Biodiversity Development Assessment Report

Industrial Subdivision

120 Old Pittwater Road, Brookvale, NSW 2100

4 November 2025

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Document Control

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Draft 1.0	Biodiversity Development Assessment Report Industrial Subdivision 120 Old Pittwater Road, Brookvale, NSW 2100	20/10/2025
Final 1.0	Biodiversity Development Assessment Report Industrial Subdivision 120 Old Pittwater Road, Brookvale, NSW 2100	4/11/2025

Executive Summary

Land Eco Consulting (Land Eco) was commissioned by Centennial ('the proponent') to prepare this Biodiversity Assessment Report (BDAR) for the proposed industrial subdivision at 120 Old Pittwater Road, Brookvale, NSW 2100 (Lot 3/-/DP868761) (the 'Subject Property') (**Figure 3**).

The proposed development involves (Reid Campell 2025):

- Demolition of existing facilities;
- Boundary adjustment and subdivision of the existing lot into three separate lots;
- Land clearing and bulk earthworks.

The location of the proposed development and the extent of all associated works and vegetation clearing is here forward referred to as the 'Subject Land'.

The proposed development requires the submission of a BDAR as stipulated under the *Biodiversity Conservation Act 2016* (BC Act) and in accordance with the Biodiversity Assessment Method 2020 (BAM). The BDAR is required to be undertaken by an accredited assessor to assess the impacts of the proposal to biodiversity. This BDAR applies the following BAM Appendices:

- Appendix C: Streamlined Assessment Module – Small Area (owing to the removal of less than 1 ha of native vegetation and a minimum lot size less than 1 ha)
- Appendix D: Streamlined Assessment Module – Planted Native Vegetation (owing to the removal of predominantly native planted vegetation)

The proposed development has been designed to avoid and minimise impacts on biodiversity values in keeping with the purposeful use of the Subject Land and its position within an existing industrial precinct. The proposed development has been situated as to avoid the unnecessary removal of mature vegetation, retaining a corridor of the highest value mature vegetation along the western boundary of the Subject Property. Furthermore, a substantial portion of the proposed vegetation removal will be limited to historically planted native and exotic vegetation positioned in landscaped garden beds across the Subject Land.

The proposed development will impact 0.51 ha of indigenous native vegetation (of which 0.42 consists of mature vegetation and 0.09 ha is limited to a sparse regenerating understorey of cosmopolitan species) assessed under the dominant plant community type within the Subject Land (PCT) (**Table 1**):

- *PCT 3592: Sydney Coastal Enriched Sandstone Forest*

Two threatened species were recorded on or near the Subject Land by Land Eco:

- Grey-headed Flying-Fox (*Pteropus policocephalus*): Single individual observed flying over the Subject Land. No roosting colonies observed. Thus, 'Foraging' Ecosystem credit only.
- White-throated Needletail (*Hirundapus caudacutus*): Small flock observed flying high above the Subject Land. Aerial foraging only. Did not land within the Subject Property. Ecosystem credit species only.

One other threatened species was possibly recorded on or near the Subject Land by Land Eco:

- Large Bent-winged Bat (*Miniopterus orianae oceanensis*) – While possible calls of this species were detected acoustically (**Appendix D**), the identification confidence is limited to the Species Group, where the call could more or less equally belong to one of two or more species, including the Large Forest Bat (Lachlan McRae Fauna Services 2025). The recordings showed low calling activity (Lachlan McRae Fauna Services 2025), suggesting the site is unlikely to support breeding. Thus, this species has been assessed as a 'Foraging' Ecosystem credit only.

Zero (0) Species Credits are required to be retired to offset the biodiversity impacts of the proposal.

Direct impacts will be limited to the removal of 0.77 ha of vegetation, of which 0.35 ha is planted mixed native and exotic vegetation. Only 0.42 ha of vegetation removal will cause as impact that requires an offset. Minor indirect impacts may influence adjoining habitat in vegetation proposed for retention. No Serious and Irreversible Impact (SAII) entities were found to be present or considered likely to be significantly impacted as a result of the proposed development.

In addition to offsetting, the *Biodiversity Conservation Act 2016* and its regulations requires that an applicant takes all reasonable effort to avoid and minimise potential impacts of the proposal on local biodiversity values. A series of mitigation

and management measures have been identified, which are to be implemented as part of any construction environmental management plan produced for the site. These include measures to:

- Assign a Project Ecologist to conduct and oversee all ecological compliance requirements associated with conducting a proposed development in line with all relevant state and commonwealth legislation and guidelines;
- Ensure all contractors employed to work within the Subject Land are suitably qualified, experienced and informed by the Project Ecologist of the sensitive ecological features and potentially occurring threatened species;
- Have an ecologist present during the clearing of vegetation required for the proposed activity;
- Incorporate locally indigenous flora species in soft landscaping associated with the development;
- Implement vertebrate pest control during construction and operation of the development;
- Implement all relevant biological hygiene protocols and requirements as per NSW Government guidelines;
- Implement ongoing management of priority weeds according to statutory requirements; and
- Implement where appropriate; sound barriers, vegetation protection fencing, stockpiling and sediment control during construction.

The proponent is required to retire biodiversity offset credits to meet their obligations to offset the residual impacts of the proposed SSD. The proponent may purchase and retire the appropriate biodiversity offset credits from Biodiversity Stewardship Sites that comply with the trading rules of the BOS in accordance with the 'like for like' report generated by the Biodiversity Assessment Method Calculator. Alternatively, the proponent can meet their offset obligations by making a payment directly into the NSW Biodiversity Offsets Payment Fund.

The total number of Ecosystem Credits is presented (**Table 1**) and the total number of Species Credits is presented (**Table 2**).

Table 1. Impacts that require an offset - ecosystem credits

Vegetation zone	PCT	TEC/EC	Impact area (ha)	Number of ecosystem credits required
Mature	PCT 3592: Sydney Coastal Enriched Sandstone Forest	-	0.42	12

Table 2. Impacts that require an offset - species credits

Common name	Scientific name	Loss of habitat (ha) or individuals	Number of species credits required
N/A	N/A	N/A	N/A

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Glossary

Acronym/ Term	Definition
BAM	New South Wales Biodiversity Assessment Method 2020
BOS	New South Wales Biodiversity Offset Scheme
BOSET	New South Wales Biodiversity Offset Scheme Entry Tool
BC Act	New South Wales Biodiversity Conservation Act 2016
BDAR	Biodiversity Development Assessment Report
CEEC	Critically Endangered Ecological Community
DA	Development Application pursuant to section 4 of the NSW Environmental Planning and Assessment Act 1979
DCP	Development Control Plan
Development	The use of land, and the subdivision of land, and the carrying out of a work, and the demolition of a building or work, and the erection of a building, and any other act, matter or thing referred to in section 26 that is controlled by an environmental planning instrument but does not include any development of a class or description prescribed by the regulations for the purposes of this definition (Environmental Planning and Assessment Act 1979).
DPIE	Department of Planning Industry and Environment
EEC	Endangered Ecological Community
EPBC Act	Commonwealth Environment Protection and Biodiversity Conservation Act 1999
EP&A Act	NSW Environmental Planning and Assessment Act 1979
ha	Hectares
km	Kilometre
KTP	Key Threatening Process (as listed in the BC Act)
LEP	Local Environment Plan
LGA	Local Government Area
Locality	The area within a 10km radius of the Subject site. The same meaning when describing a local population of a species or local occurrence of an ecological community.
m	Metres
mm	Millimetres
NPWS	NSW National Parks and Wildlife Services
NSW	New South Wales
OEH	Office of Environment and Heritage (now the Department of Planning Industry and Environment)
Proposal	The development, activity or action proposed.
SEPP	State Environmental Planning Policy
SSD	State Significant Development
Subject Land	Maximum extent of the proposed development within the Subject Land. The Subject Land covers the entirety of the Subject Property.
Subject Property	120 Old Pittwater Road, Brookvale, NSW 2100 (Lot 3/-/DP868761)
Threatened species, populations and ecological communities	Species, populations and ecological communities specified in Schedules 1, 1A and 2 and *threatened species, population or ecological community* means a species, population or ecological community specified in any of those Schedules.

Declarations

i. Certification under clause 6.15 Biodiversity Conservation Act 2016

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

Signature: 

Date: 4/11/25

BAM Assessor Accreditation no: #BAAS18059

This BDAR has been prepared to meet the requirements of BAM 2020.

It is important to note, that this report must be submitted to Council for DA within 14 days of submitting it through the NSW Biodiversity Offset Assessment Management System (BOAMS). Land Eco must be notified in writing by the applicant the precise day that they wish to submit DA to Council to enable us to submit the report through the BOAMS portal. If the applicant chooses to delay their lodgement, or does not notify us of lodgement, the client does so at their own risk. Further to this, if the development design changes between the time we finalise this report, and the time the DA is lodged, this BDAR will not be valid.

ii. Details and experience of author/s and contributors

Authors and Contributors

Name	BAM Assessor Accreditation no.	Position/Role	Tasks Performed	Relevant Qualifications
Kurtis Lindsay	#BAAS18059	Principal Ecologist	Document Review Flora Identification	*BSc (Hons)*
Semonn Oleksyn		Senior Ecologist (Project Manager)	Targeted Surveys BAM VIS Plot Surveys Document Review	*BAdvSci* *MRes*
Rebecca Asquith		Ecologist	BAM VIS Plot Surveys Report Preparation	*BEnvSc (Hons)*
Juliette Hennessy		Ecologist	Targeted Surveys Report Preparation	*BSc (Hons)*
Issac Digby		Ecologist	Targeted Surveys	*BMBiol*
Joseph Crane		Ecologist	Targeted Surveys	
Sam Dreux		Ecologist	Targeted Surveys	*MsZool*
Cameron Reed-Rowatt		Ecologist	Targeted Surveys	
Barry Cronin		Ecologist	Targeted Surveys	*BSc* *MSc*
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Stage 1: Biodiversity Assessment

1. Introduction

1.1 Proposed Development

1.1.1 Development Overview

Land Eco Consulting (Land Eco) was commissioned by Centennial ('the proponent') to prepare this Biodiversity Development Assessment Report (BDAR) for an industrial subdivision at 120 Old Pittwater Road, Brookvale, NSW 2100 (Lot 3/-/DP868761) (the 'Subject Property') (**Figure 3**). The extent of the proposed development and associated works is here forward referred to as the 'Subject Land' (**Figure 1**).

The proposed development involves (Reid Campell 2025):

- Demolition of existing facilities;
- Boundary adjustment and subdivision of the existing lot into three separate lots;
- Land clearing and bulk earthworks.

The proposed development is a local development application and is subject to approval under Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act). The proponent has commissioned this Biodiversity Development Assessment Report (BDAR) to accompany the proposal and address the requirements of the NSW Biodiversity Offset Scheme (BOS) as stipulated under the Biodiversity Conservation Act 2016 (BC Act) and in accordance with the Biodiversity Assessment Method (BAM). The BDAR is required to be undertaken by an accredited assessor to assess the impacts of the proposal.

Land Eco have produced this report to assess any potential impacts associated with the proposed development and recommend appropriate measures to mitigate any potential ecological impacts in line with the requirements of the Consent Authority, Northern Beaches Council.

1.1.2 Location

The Subject Property, 120 Old Pittwater Road, Brookvale, NSW 2100 (Lot 3/-/DP868761) occurs in the northern Sydney suburb of Brookvale within the Northern Beaches Local Government Area (LGA). The use of the Subject Property is currently regulated under the Warringah Local Environmental Plan (WLEP 2011).

This BDAR assesses the direct vegetation impacts from the proposed development footprint within the Subject Land (**Figure 1**).

1.1.3 Proposed development and the Subject Land

The proposed DA seeks approval for the demolition of existing industrial facilities for the boundary adjustment and subdivision of the Subject Property into three lots for new industrial facilities at 120 Old Pittwater Road, Brookvale (**Figure 3**) (Reid Campbell 2025).

The proposed development will require the removal of approximately 0.77 ha of vegetation, including 0.42 ha of mature self-sown native vegetation and 0.35 ha of mixed native and exotic planted vegetation (of which 0.09 ha of sparse regenerating understorey). The native vegetation proposed to be removed includes canopy, mid-stratum, and groundcover species.

1.1.4 Other documentation

Other documentation relevant to biodiversity to be submitted with the proposed development include:

- Arboricultural Impact Assessment (Urban Arbor 2025)
- Design Plans (Reid Campbell 2025)

1.2 Biodiversity Offset Scheme Entry

The proposed development is a local development application and is subject to approval under Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act). The proponent has commissioned this Biodiversity Development Assessment Report (BDAR) to accompany the proposal and address the requirements of the NSW Biodiversity Offset Scheme (BOS) as stipulated under the Biodiversity Conservation Act 2016 (BC Act) and in accordance with the Biodiversity Assessment Method (BAM). The BDAR is required to be undertaken by an accredited assessor to assess the impacts of the proposal.

This BDAR applies the following BAM Appendices:

- Appendix C: Streamlined Assessment Module – Small Area (owing to the removal of less than 1 ha of native vegetation and a minimum lot size less than 1 ha)
- Appendix D: Streamlined Assessment Module – Planted Native Vegetation (owing to the removal of areas consisting of native planted vegetation)

1.2.1 Area Clearing Threshold

The BC Act and its regulations stipulate the native vegetation clearing 'area threshold' values that determine whether an development is required to be assessed in accordance with the BOS. Minimum entry thresholds for native vegetation clearing depend on the minimum lot size (shown in lot size maps 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). The term 'vegetation clearing' includes all lopping, felling, slashing, or mowing of native trees, shrubs, or groundcover for the purpose of construction, landscaping, excavation or bushfire Asset Protection Zone (APZ) works.

Developments that trigger the BOS will require a BDAR (this report) that addresses the Biodiversity Assessment Method (BAM) and the retiring of Biodiversity Offset Credits.

The minimum lot size is 0.4 ha as prescribed by the Warringah Local Environmental Plan (WLEP 2011). This means the 'native vegetation clearing threshold' trigger for this BOS is 0.25 ha (**Table 3**). The proposed development requires the removal of more than 0.25 ha of native vegetation; therefore, this is a trigger for the BOS.

Table 3. Biodiversity Offset Scheme Entry Thresholds

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

1.2.2 Biodiversity Value Mapping

At the time of preparing this report, the Subject Land does not contain land mapped as a 'Biodiversity Value' (**Figure 2**) (NSW DCCEEW 2025d). Native vegetation will not be removed from the land mapped 'Biodiversity Value'. Therefore, this will not trigger the BOS.

Figure 1. Location of the Subject Land

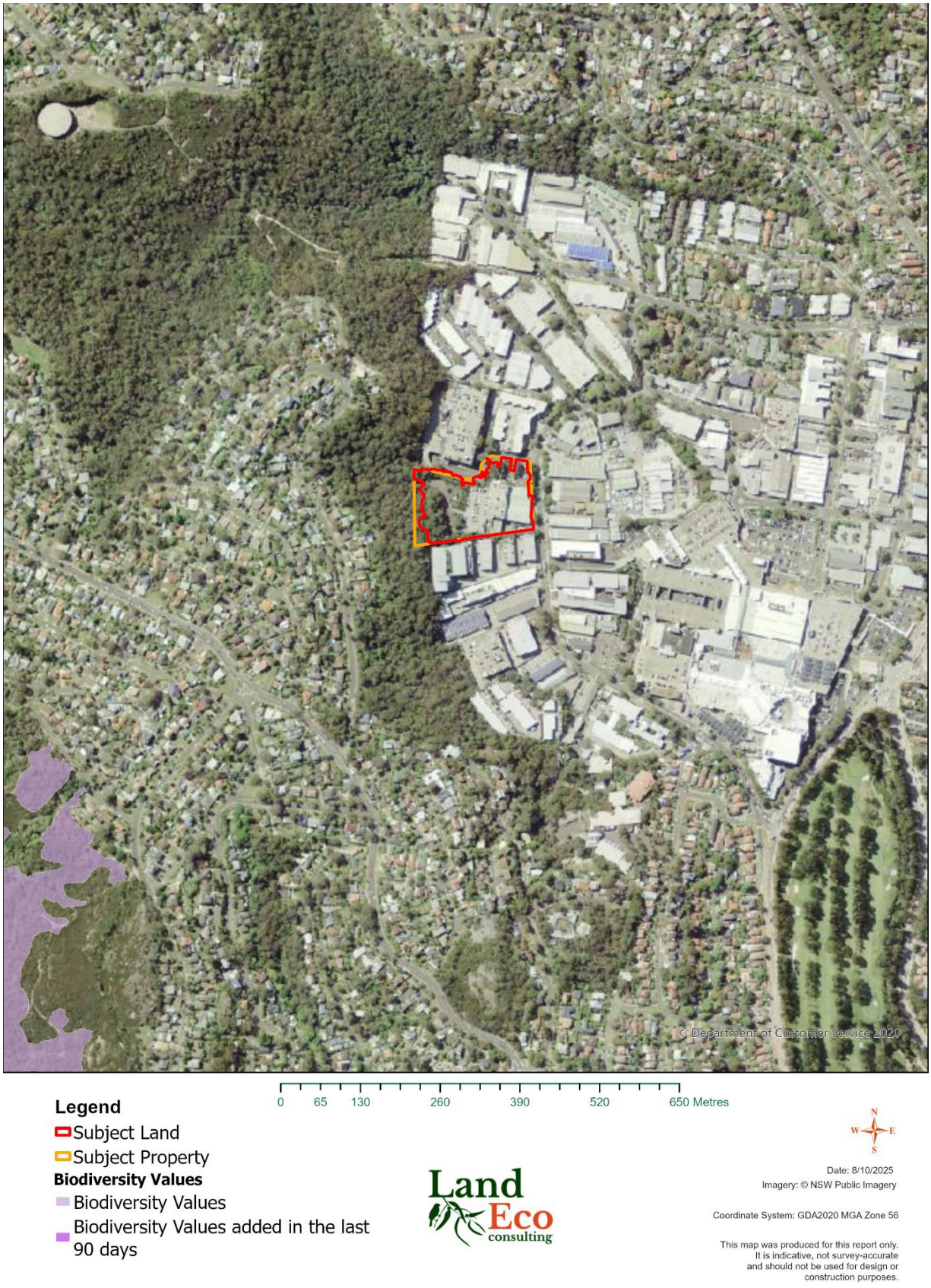

Figure 2. Biodiversity Values Mapping (NSW DCCEEW 2025d) in relation to the Subject Land

1.3 Excluded Impacts

1.3.1 Native Vegetation Regulatory Map

The entirety of the Subject Land is mapped as 'Land excluded from the LLS Act' by the Native Vegetation Regulatory Map (NSW DCCEEW 2025c). Therefore, *Chapter 2 Vegetation in non-rural areas of the State Environmental Planning Policy (Biodiversity and Conservation) 2021* applies to this development.

1.4 Matters of National Environmental Significance

Commonwealth listed threatened species that are MNES have potential to occur in the Subject Land on occasion.

Grey-headed Flying-foxes (*Pteropus poliocephalus*) which are listed as 'vulnerable' under the EPBC Act were observed flying over the Subject Property. This species was not observed landing or roosting within the Subject Land and no breeding camps were found within the Subject Property.

Several White-throated Needletail (*Hirundapus caudacutus*) which are listed as 'vulnerable' under the EPBC Act were observed flying over the Subject Property. These species may forage over the Subject Land on occasion, though are unlikely to rely heavily upon the vegetation within the Subject Land owing to its disturbed urban locality. These species will continue to utilise habitat the Subject Land in the same manner post-development.

Extensive targeted survey effort did not reveal any other Matters of National Environmental Significance within the Subject Property.

No Matters of National Environmental Significance are likely to be significantly impacted by the proposed development. No referral to the Commonwealth is recommended for the proposed development.

1.5 Information Sources

A detailed list of all sources utilised in the preparation of this BDAR is presented in the 'References' (**Section 14**) of this report.

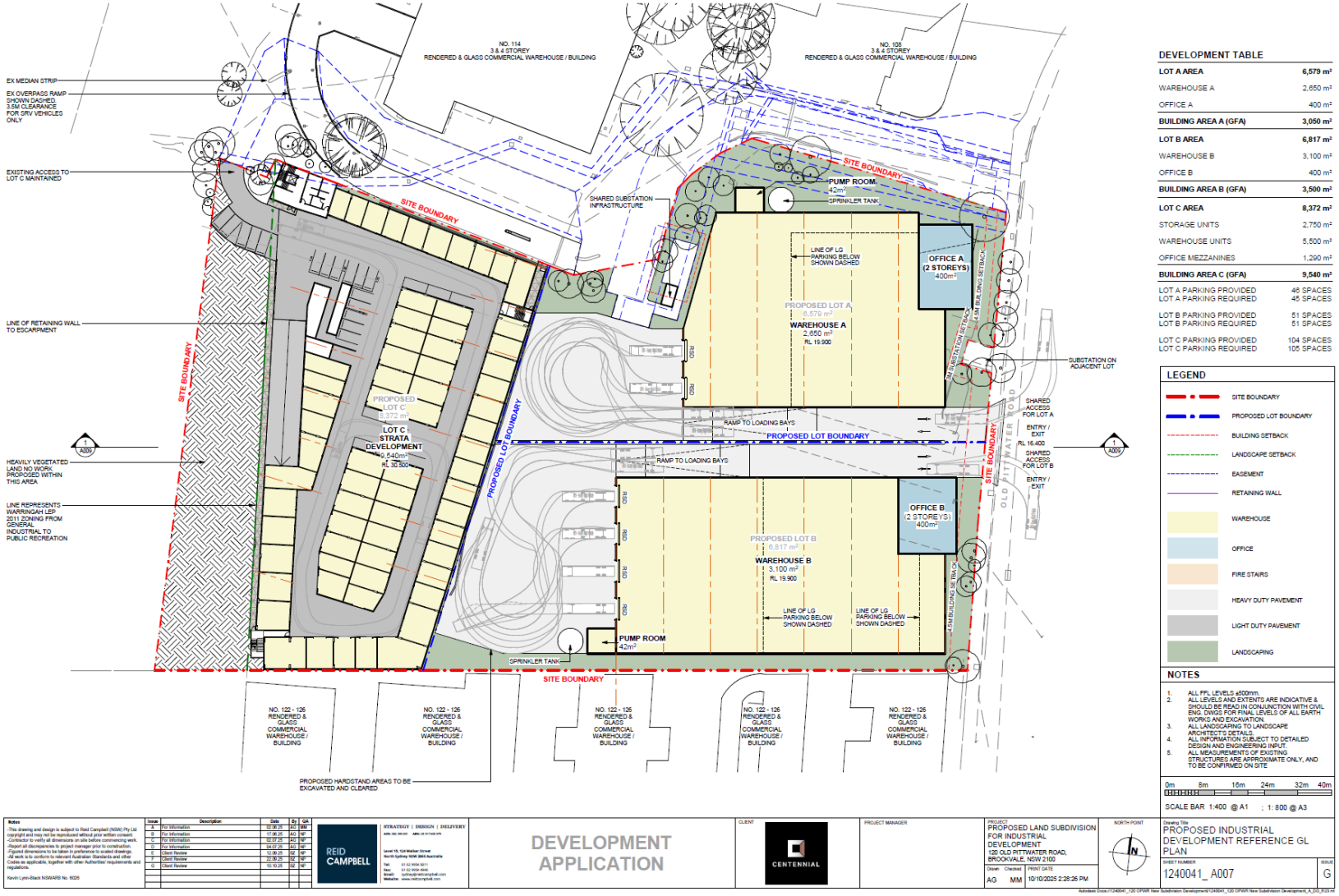

Figure 3. Proposed Development Plan (Reid Campbell 2025)

2. Method

2.1 Site Context Methods

2.1.1 Landscape Features

The Subject Land contains an existing industrial warehouse and office building along with associated carparks, roads, hardstand and landscaping. The Subject Property contains a mixture of mature native vegetation in the west, and planted native and exotic vegetation within the built-up areas, with a mixture of eucalypts (*Eucalyptus spp.*), *Casuarina glauca* and *Melaleuca quinquenervia* over commonly planted native and exotic ornamental shrubs and groundcovers. The Subject Land is surrounded by roads to the north and east and is located within an industrial area. High connectivity to surrounding habitat in mature native bushland occurs to the west.

2.2 Native vegetation, threatened ecological communities and vegetation integrity methods

2.2.1 Existing Information

Broad mapping of vegetation communities have been undertaken as follows:

- NSW State Vegetation Type Map (NSW DCCEEW 2024).

This resource mapped two plant community types in close proximity to the Subject Property including:

- PCT 3593: Sydney Coastal Sandstone Bloodwood Shrub Forest
- PCT 3595: Sydney Coastal Sandstone Gully Forest

This historical mapping is coarse and most of the polygons have not been ground-truthed by Ecologists.

2.2.2 Mapping Native Vegetation Extent

Land Eco mapped the native vegetation extent within the Subject Land by:

- Viewing recent aerial imagery (Nearmap 2025) for differences in texture that would suggest different vegetation zones; followed by;

- conducting a ground-based meandering transect, identifying native vegetation and marking the extent using a Garmin 65S hand-held GPS.

Plant Community Type (PCT) selection was undertaken using information from the BioNet Plant Community Type data (NSW DCCEEW 2022a).

2.2.3 Plot-based Vegetation Survey

Two representative BAM Vegetation Integrity Survey (VIS) plots were allocated to the vegetation within the Subject Land using GIS to capture a representative sample of the vegetation proposed for removal (**Figure 10**).

Two Ecologists then visited the Subject Land and sampled a 400 m^2 floristic plot within each BAM VIS plot. The full species name, percentage cover, and estimate of abundance all native and exotic vascular plant species were recorded.

2.2.4 Vegetation Integrity Survey

Two irregularly shaped VIS plots were conducted within the Subject Land. These plots were located to provide a representative assessment of vegetation integrity (**Figure 10).**

The survey plots were established as follows:

BAM Plot 1

- One irregular 400 m^2 plot, to assess all the composition and structure attributes
- One irregular 1000m^2 plot, to assess the function attributes (number of large trees, stem size classes, tree regeneration and length of logs)
- Five 1 m^2 subplots, to assess average litter cover (and other optional ground cover components) for the plot.

BAM Plot 2

- One irregular 400 m^2 plot, to assess all the composition and structure attributes
- One irregular 620m^2 plot, to assess the function attributes (number of large trees, stem size classes, tree regeneration and length of logs)
- Five 1 m^2 subplots, to assess average litter cover (and other optional ground cover components) for the plot.

The presence of hollow-bearing trees, the composition, the vegetation structure and vegetation function were all assessed according to the protocol outlined in Section 4.3.4 of the BAM (NSW DPIE 2020a).

Advice from the Biodiversity, Conservation and Science Group (BCS) of the Department of Climate Change, Energy, the Environment and Water (DCCEEW) in relation to another BDAR in the Cumberland IBRA subregion was provided on 5 September 2024:

"*In order to achieve the required sampling effort, either:*

- *the plot should be made to 1000 m2 in area by extending it beyond the Subject Land boundary to include adjacent area in similar broad condition, or;*
- *where there is insufficient adjoining area in similar broad condition, measurements should be collected from largest possible area of similar broad condition and then scaled proportionally to a notional 1000 m2 area.*"

The vegetation function attribute measurements (other than litter cover) for BAM Plot 2 were collected from the largest possible contiguous patch of similar broad condition within the Subject Land and then scaled proportionally to a notional 1000 m^2 area. However, given the extremely sparse 'function' data traits present within this vegetation zone, it is not expected that any additional area within this zone would have yielded data that would have contributed to a higher VI score. As such, no modifications were made to the plot data for BAM Plot 2 despite only sampling ~620m for the function attributes.

2.3 Threatened Flora Survey Methods

2.3.1 Review of Existing Information

Land Eco reviewed any existing information on native vegetation relevant to the Subject Land and land within the 1500 m buffer area. This includes:

- individual species records that are held in the NSW Wildlife Atlas BioNet (NSW DCCEEW 2025b);
- existing maps of native vegetation in the area such as those held by the Department, or a local government authority;
- information from publicly accessible ecological reports, soil surveys or previous native vegetation surveys that is relevant to the Subject Land (where available).

2.3.2 Habitat Constraints Assessment

Land Eco compiled a detailed summary of potential microhabitats for threatened flora species as well as habitat constraints present on the Subject Land. Where relevant, habitat features were mapped and photographed.

2.3.3 Field Surveys

A suite of Flora Species Credit species were identified within the BAMC (OEH 2025) and NSW Wildlife Atlas (NSW DCCEEW 2025b) as having the potential to occur within the Subject Land (**Table 14**). Targeted surveys were undertaken for all species that were considered likely to occur (**Table 16**).

2.4 Threatened Fauna Survey Methods

2.4.1 Review of Existing Information

Land Eco reviewed any existing information on threatened fauna relevant to the Subject Land and land within the 1500 m buffer area. This includes:

- survey data or individual species records that are held in NSW Wildlife Atlas BioNet (NSW DCCEEW 2025b);
- information in ecological reports, soil surveys or previous fauna surveys that is relevant to the Subject Land (where available).

2.4.2 Habitat Constraints Assessment

Land Eco compiled a detailed summary of potential microhabitats for threatened fauna species as well as habitat constraints present on the Subject Land. Where relevant, habitat features were mapped and photographed.

2.4.3 Field Surveys

A suite of Fauna Species Credit species was identified within the BAMC (OEH 2025) and NSW Wildlife Atlas (DPE 2025b) as having the potential to occur within the Subject Land (**Table 15**). Targeted surveys were undertaken for all species that were considered likely to occur (**Table 17**).

2.5 Survey Schedule and Weather Conditions

The weather conditions in the lead up to and during all surveys were suitable for the surveys undertaken (**Table 4**).

Monthly averages are displayed in **Table 4** to demonstrate the general climatic conditions.

Table 4. Environmental conditions during and leading up to biodiversity surveys recorded at Terry Hills Weather Station (BOM 2024; 2025). Monthly temperature averages (min-max) and total monthly rainfall are shown in bold.

Survey undertaken (e.g. method / targeted species)	Date	Time	Temperature (°C) (min. & max.)	Wind (light, mod…)	Rainfall (mm)
N/A	**January 2024**	**N/A**	**15.6-37.5**	**N/A**	**142.2**
Site Assessment and Vegetation Mapping	24/01/2024	8:45-14:30	18.1-28.4	Light	0.6
N/A	**May 2024**	**N/A**	**4.8-25.2**	**N/A**	**157.6**
N/A	**June 2024**	**N/A**	**8.4-16.0**	**N/A**	**225.0**
Dusk/Nocturnal surveys Sooty Owl (*Tyto tenebricosa*)	28/05/2024	17:00-19:30	8.3-20.9	Light	0.2
	29/05/2024	17:00-20:00	9.8-21.4	Light	0
	30/05/2024	17:00-19:45	12.0- 22.1	Light	0
	3/06/2024	16:35-19:30	8.4-16.1	Light	0
	4/06/2024	16:40-19:45	5.9-16.3	Light	0
	13/06/2024	17:00-19:30	7.9-14.2	Light	0
Fungi transects *Hygrocybe spp. (reesiae)*	28/05/2024	13:45-16:15	8.3-20.9	Light	0.2
	29/05/2024	13:30-16:10	9.8-21.4	Light	0
	30/05/2024	14:00-16:45	12.0- 22.1	Light	0
	6/06/2024	9:30-12:00	10.3-16.0	Light	N/A
	13/06/2024	14:00-16:30	7.9-14.2	Light	0
N/A	**October 2024**	**N/A**	**13.0-21.7**	**N/A**	**22.8**
N/A	**November 2024**	**N/A**	**16.7-24.7**	**N/A**	**78.8**
N/A	**December 2024**	**N/A**	**13.7-37.0**	**N/A**	**31.4**
Flora transects *Hibbertia spanantha, Rhizanthella slateri, Melaleuca deanei, Persoonia hirsuta, Prostanthera marifolia*	24/10/2024	9:00-12:00	17.0-20.4	Light	0
	31/10/2024	9:00-12:00	14.9-26.7	Light	0
	17/11/2024	9:00-12:00	18.6-26.2	Light	0.4
	21/11/2024	9:00-12:00	15.9-23.3	Light	0
	26/11/2024	9:00-12:00	17.4-31.9	Light	0
Flora transects *Deyeuxia appressa*	17/12/2024	9:00-12:00	19.5-34.4	Light	0
Fauna Cameras Deployment of fauna camera traps	7/11/2024	9:00-12:00	19.5-32.4	Light	0

Survey undertaken (e.g. method / targeted species)	Date	Time	Temperature (°C) (min. & max.)	Wind (light, mod…)	Rainfall (mm)
N/A	**January 2025**	**N/A**	**13.0-40.1**	**N/A**	**191.8**
Microbat survey Deployment of bioacoustic devices for Large-eared Pied Bat (*Chalinolobus dwyeri*) and Eastern Cave Bat (*Vespadelus troughtoni*)	24/1/2025 – 28/1/2025	4 nights	16.9-24.0	Light	1.0
N/A	**February 2025**	**N/A**	**18.2-26.3**	**N/A**	**40.2**
N/A	**April 2025**	**N/A**	**12.9-29.0**	**N/A**	**93.6**
Dusk/Nocturnal surveys Broad-headed Snake (*Hoplocephalus bungaroides*),	19/2/2025	19:20-21:00	17.6-25.2	Light	0
	20/2/2025	19:30-21:35	17.8-21.2	Light	0
	24/2/2025	19:30-21:30	19.4-28.2	Light	0
	25/2/2025	19:30-21:30	19.1-21.2	Light	0
	26/2/2025	19:30-21:30	18.3-27.0	Light	0.2
	27/2/2025	19:30-21:30	20.0-28.1	Light	0
	4/4/2025	19:30-21:30	14.8-25.6	Light	0
	7/4/2025	17:00-19:10	13.3-25.6	Light	0
Flora transects *Genoplesium baueri*	20/2/2025	17:00-19:10	17.8-21.2	Light	0
	24/2/2025	17:00-19:10	19.4-28.2	Light	0
N/A	**July 2025**	**N/A**	**4.3-19.9**	**N/A**	**138.8**
BAM VIS Plot Survey and Vegetation Mapping	23/07/2025	11:00-15:00	11.7-18.5	Light	2.4

2.6 Limitations

The surveys undertaken for this BDAR are in accordance with relevant guidelines and were undertaken at an appropriate time of year during periods of suitable weather. Thus, there are no limitations that should cause uncertainty with their findings.

3. Site Context

3.1 Assessment Area

The Assessment Area includes a 1500m buffer zone surrounding the Subject Land (**Figure 4**).

3.2 Landscape Features

Landscape features identified within the Subject Land and assessment are detailed and presented in **Figure 4** to **Figure 8.** A discussion of relevant landscape features is provided below.

3.2.1 IBRA Bioregions and Subregions

In accordance with BAM Subsection 3.1.3(2) the Subject Land has been mapped to IBRA Bioregion and Subregion. The Subject Land occurs within the 'Sydney Basin' Interim Biogeographic Regionalisation for Australia ver. 7 (IBRA) bioregion, and 'Pittwater' IBRA subregion (DEE 2016; **Figure 5**).

3.2.2 Rivers, Streams, Estuaries and Wetlands

This subsection details wetlands, rivers and streams classified according to stream order (as described in BAM Subsection 3.1.3(3.) and Appendix E).

There are no mapped watercourses within the Subject Land. The nearest mapped watercourse is a third-order tributary named Brookvale Creek that occurs approximately 220m north-east of the Subject Land (**Figure 6**).

3.2.3 Habitat Connectivity

In accordance with connectivity of different areas of habitat (as described in BAM Subsection 3.1.3(5–6)) the assessor must identify the connectivity of different areas of habitat that may facilitate the movement of threatened species across their range and identify these on a map (**Figure 7**).

Land Eco has identified routes of habitat connectivity within the Assessment Area and has classified them into two categories:

- Habitat Connection – a local-scale habitat connection consisting of a narrow or disturbed vegetation corridor (i.e. canopy connectivity); and
- Major Biodiversity Corridor – a locally significant habitat corridor consisting of remnant vegetation, reserves, densely vegetation riparian corridors or wetlands.

The vegetation within the Subject Property forms part of a major habitat corridor for wildlife (**Figure 7**). Major habitat corridors run through nearby Garigal National Park and Ku-ring-gai National Park with smaller habitat links connecting these corridors throughout the existing urban infrastructure where remnant native vegetation has been retained. Several obstacles disrupt the habitat connectivity between the Subject Land and the vegetation in the locality including roads such as Allambie Road to the south and west, and Warringah Road to the north, along with existing industrial and commercial developments.

The mature bushland within the Subject Property forms habitat links that connect to larger habitat corridors in the adjacent reserves. The Subject Property links directly with Allenby Falls Park which represents a stepping stone for fauna as they travel throughout the reserves and national parks in the locality (**Figure 7**). The proposed development seeks to retain the habitat link with Allenby Falls Park.

Impacts of development on the connectivity of different forms of habitat have been considered by the assessor (see **Section 9**).

3.2.4 Karst, Caves, Crevices, Cliffs, Rocks or Other Geological Features of Significance

In accordance with BAM Subsections 3.1.3(7.) and 3.1.3(12.) the assessor must detail karst, caves, crevices, cliffs, rocks and other geological features of significance and for vegetation clearing proposals, soil hazard features.

Sandstone rock crevices were identified within the western portion of the Subject Land. A sandstone cliff with overhangs was identified within 150m of the Subject Land which may be indirectly impacted by the proposed development.

The Subject Property is mapped within the disturbed terrain soil landscapes (NSW DCCEEW 2025a). This soil landscape is described as having level plain to hummocky terrain, extensively disturbed by human activity, including complete disturbance, removal or burial of soil. Local relief <10 m, slopes <30%. Landfill includes soil, rock, building and waste materials. Soil is turfed fill areas commonly capped with up to 40 cm of sandy loam or up to 60 cm of compacted clay over fill or waste materials. Limitations are dependent on nature of fill material but include mass movement hazard, unconsolidated low wet strength materials, impermeable soil, poor drainage, localised very low fertility and toxic materials.

3.2.5 Areas of Outstanding Biodiversity Value

No areas of Outstanding Biodiversity Value occur within the Subject Land or Assessment Area.

3.2.6 Mitchell Landscapes

NSW Landscapes Mapping: Background and Methodology (Mitchell 2002; OEH 2016a) groups ecosystems into meso-ecosystems representing larger natural entities based on topography and geology. The naming of ecosystems and meso-ecosystems was standardised so that each name provided location information and a meaningful descriptive landscape term.

The Subject Land occurs over the 'Belrose Coastal Slopes' Mitchell Landscape (**Figure 8**).

3.2.6.1 Landscape Ecosystem: Belrose Coastal Slopes

Benched hill slopes and deep valleys of the coastal fall on horizontal Triassic quartz sandstone, lithic sandstone and shales. High proportion of rock outcrop with discontinuous cliffs to 5m high. General elevation 0 to 180m, local relief 80m. Shallow uniform or gradational sands and earthy sands on ridges, deeper sands, loamy sands and organic sands on wet benches and in hanging swamps, grey or yellow texture-contrast soils on shale benches. Accumulations of deeper sand and occasional podsols in depositional sites and along streams. Low woodland of scribbly gum (*Eucalyptyus haeomostoma*), red bloodwood (*Corymbia gummifera*), yellow-top ash (*Eucalyptus leuhmanniana*), and narrow-leaved apple (*Angophora bakeri*) in deeper soils on ridges. Scrub and heath of she-oak (*Allocasuarina distyla*) and heath banksia (*Banksia ericifolia*), with other Hakea, Grevillea, and *Baeckea sp.,* on ridges and upper benches. Wet heath and swamps with *Gahnia sp.* and swamp banksia (*Banksia robur*) in hanging valleys. Coastal forest in sheltered areas on better quality shale soil with; Sydney blue gum (*Eucalyptus saligna*), blackbutt (*Eucalyptus pilularis*), turpentine (*Syncarpia glomulifera*), grey ironbark (*Eucalyptus paniculata*), spotted gum (*Corymbia maculata*), southern mahogany *(Eucalyptus botryoides*), cabbage-tree palm *(Livistona australis*) and burrawang (*Macrozamia sp.*). Coastal headlands with scrub of *Allocasuarina distyla*, coast rosemary (*Westringea fruticosa*), and dwarf kangaroo grass (*Themeda triandra*) (Mitchell 2002; OEH 2016a).

3.2.7 Additional Landscape Features Identified

No additional landscape features are identified in the Subject Land for the proposed development.

3.2.8 Soil Hazard Features

The proposed development does not require approval from the Native Vegetation Panel under Part 5A of the LLS Act or the Vegetation SEPP as is mapped 'Category 1 – Exempt Land', therefore the soil hazard features are not relevant to this development.

3.3 Native Vegetation Cover

A 1500m 'assessment circle' surrounding the outside boundary of the Subject Land was prepared in order to determine the extent of native vegetation within the surrounding locality of the Subject Land (**Figure 4**). Native vegetation was determined from public aerial imagery and local knowledge of the locality. The results are presented in **Table 5.**

Table 5. Native vegetation cover in the Assessment Area

Assessment area (ha)	802.02 ha
Total area of native vegetation cover (ha)	261.9 ha
Percentage of native vegetation cover	32.66% (rounded up to 33% in BAMC)
Class (0-10, >10-30, >30-70 or >70%)	>30-70%

Figure 4. Native vegetation patches within the area surrounding the Subject Land (1500m buffer)

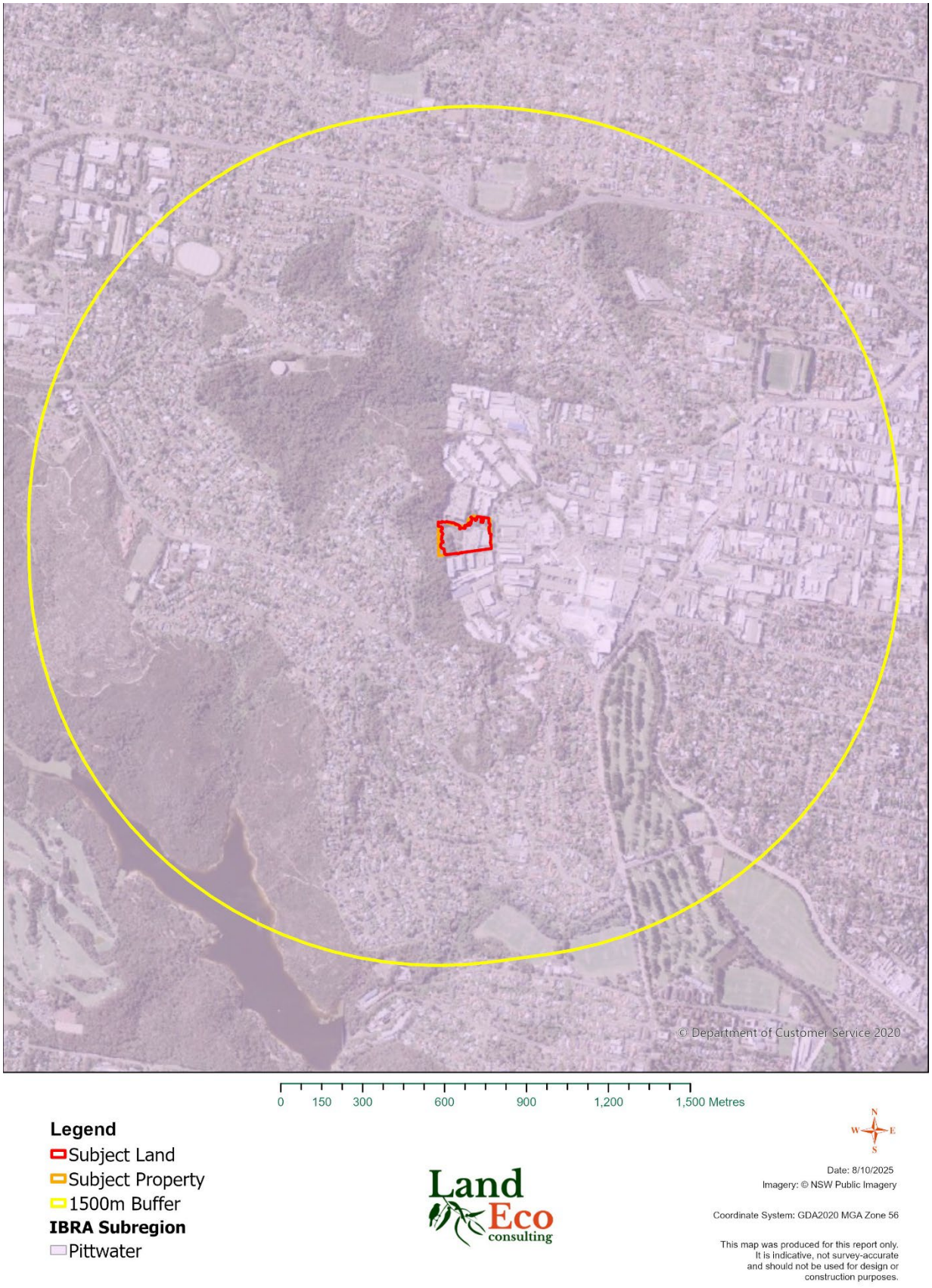

Figure 5. The Subject Land lies entirely within the Pittwater IBRA 7 Subregion of the Sydney Basin IBRA7 Bioregion.

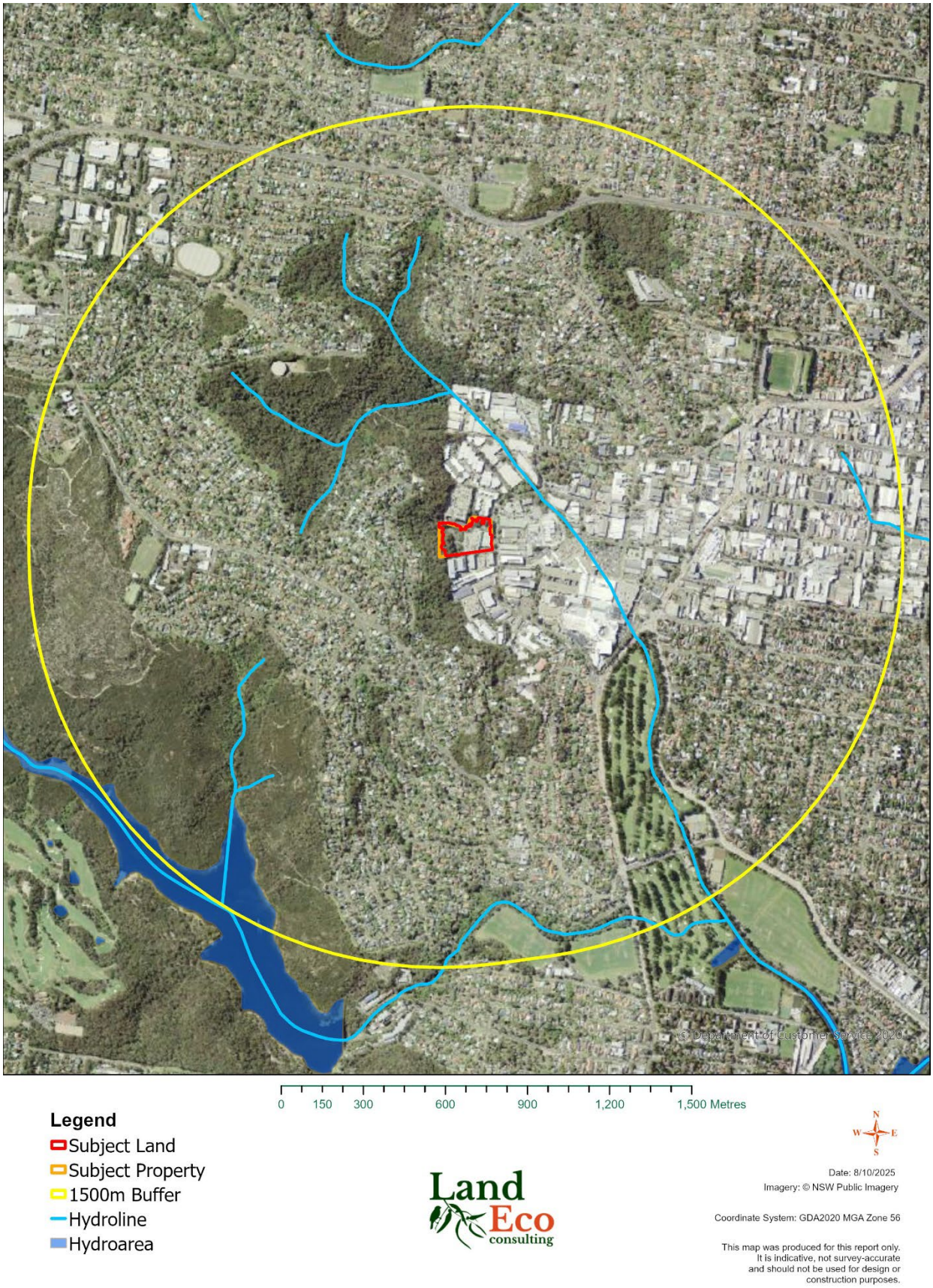

Figure 6. Mapped watercourses within the vicinity of the Subject Land.

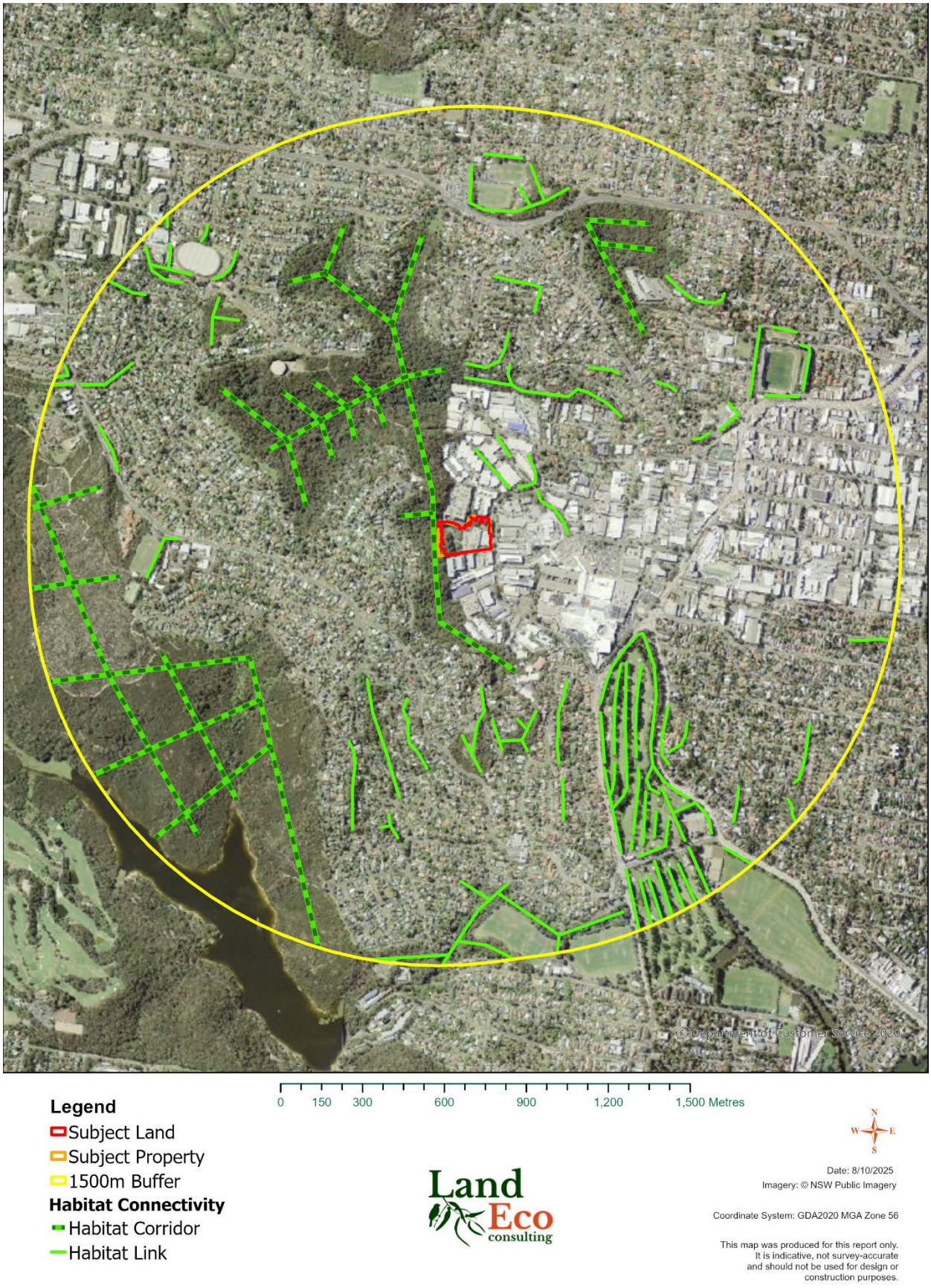

Figure 7. Terrestrial habitat connectivity links near the Subject Land and surrounding area.

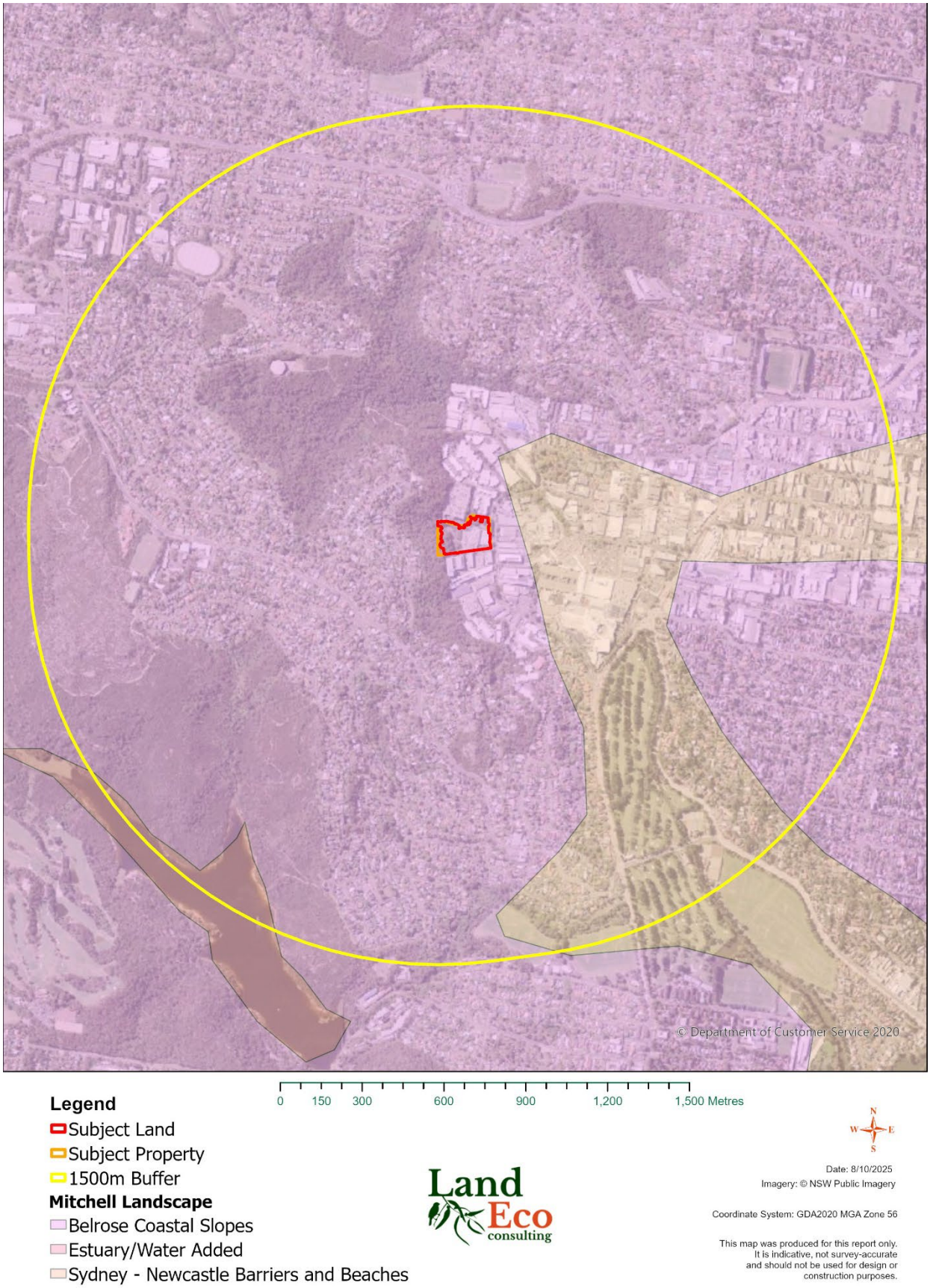

Figure 8. The Mitchell Landscapes that comprise the Subject Land and the surrounding assessment area.

4. Native Vegetation, Threatened Ecological Communities and Vegetation Integrity

4.1 Native Vegetation Extent

Land Eco mapped the native vegetation extent within the Subject Land (as described in BAM Section 4.1(1–3.) and BAM Subsection 4.1.1). Impacts to vegetation required to facilitate the proposed development are presented in **Table 6.**

Table 6. Impacts to vegetation for the proposed development

Vegetation type	Area to be removed (ha) for Development
PCT 3592: Sydney Coastal Enriched Sandstone Forest (Mature)	0.42
PCT 3592: Sydney Coastal Enriched Sandstone Forest (Sparse Regenerating Understorey)	0.09 (present underneath a portion of 'Planted Mixed Native/Exotic Vegetation)
Planted Mixed Native/Exotic Vegetation	0.35
Total Vegetation	**0.77**
Total Assessable Under BAM	**0.51**

4.1.1 Changes to the Mapped Native Vegetation Extent

The actual native vegetation extent matches that shown on the aerial imagery used in the figures of this report with the exception of small portions of unmapped vegetated land displayed in the public imagery in **Figure 4** which have since been cleared for recent urban development.

The 0.09 ha of PCT 3592: Sydney Coastal Enriched Sandstone Forest (Sparse Regenerating Understorey) is underneath the Planted Mixed Native/Exotic Vegetation, and therefore is included within the 0.35 ha of vegetation removal.

4.1.2 Non-native vegetation

All parts of the Subject Land that supported vegetation have been mapped accordingly (**Figure 13**). The remaining area is built structures. While non-native vegetation is present within the Subject Land, it is interspersed with native vegetation and thus not separately mapped.

4.1.3 Planted Native Vegetation

The Subject Land contains planted native vegetation (**Plate 1**) that:

- *Does not occur within an area that contains a mosaic of planted and remnant native vegetation and which can be reasonably assigned to a PCT known to occur in the same IBRA subregion as the proposal, and*
- *was not planted for the purpose of environmental rehabilitation or restoration under an existing conservation obligation listed in BAM Section 11.9(2.), and the primary objective was not to replace or regenerate a plant community type or a threatened plant species population or its habitat, and*
- *was not planted for the purpose of providing threatened species habitat under one of the following:*
    a. *a species recovery project*
    b. *Saving our Species project*
    c. *other types of government funded restoration project*

d. *condition of consent for a development approval that required those species to be planted or translocated for the purpose of providing threatened species habitat*
e. *legal obligation as part of a condition or ruling of court. This includes regulatory directed or ordered remedial plantings (e.g. Remediation Order for clearing without consent issued under the BC Act or the Native Vegetation Act)*
f. *ecological rehabilitation to re-establish a PCT or TEC that was, or is carried out under a mine operations plan,*
g. *approved vegetation management plan (e.g. as required as part of a Controlled Activity Approval for works on waterfront land under the NSW Water Management Act 2000).*

- *was not planted for revegetation, environmental rehabilitation or restoration, and*
- *was planted for functional and aesthetic purposes.*

Historical imagery from 1965 and 1991 depicts the clearing of native vegetation within the Subject Property. Since 1965, the native vegetation on the elevated escarpment along the western boundary regenerated into a structurally complete, species rich forest while the remainder of the vegetation has been infill planted and maintained as landscaped garden beds amongst the existing facilities (**Figure 9**). As the native vegetation was planted for functional and aesthetic purposes surrounding the existing facilities within the Subject Land, it meets subsection D.1 (5.i.) of the decision tree in Appendix D of the BAM, and has been assessed accordingly (i.e. excluded from credit calculations).

Plate 1. Representative photo of Planted Native Vegetation in garden beds

Figure 9. Historical Imagery from 1965 (left) and 1991 (right) displaying the historical clearing, development and planting of native vegetation undertaken within the Subject Property (NSW Historical Imagery 2025)

4.2 Plant Community Types

4.2.1 Overview

Vegetation within the Subject Land has been assessed as aligning with one BioNet Vegetation Classification PCT identified within **Table 7** and their extent is shown in **Figure 13** and **Figure 14.**

Detailed descriptions of each PCT are provided in the following subsections.

Table 7. PCTs and Vegetation Zones identified within the Subject Land

PCT ID	PCT name	Vegetation Zone	Management Zone	Subject Land Area (ha)
3592	Sydney Coastal Enriched Sandstone Forest	Mature	Complete Removal	0.39
			Understory Removal Only	0.01
			Canopy Removal Only	0.02
		Sparse Regenerating Understorey	N/A	0.09
		Total area		0.51

4.2.2 PCT 3592 Sydney Coastal Enriched Sandstone Forest

In accordance with Appendix C of the BAM, PCT 3592 was determined to be the largest vegetation community within the Subject Land.

Table 8. PCT 3592 Sydney Coastal Enriched Sandstone Forest

PCT ID	3592
PCT name	Sydney Coastal Enriched Sandstone Forest
Vegetation formation	Dry Sclerophyll Forests (Shrubby sub-formation)
Vegetation class	Sydney Coastal Dry Sclerophyll Forests
Per cent cleared value (%)	60.82 %
Extent within subject land (ha)	0.51
Condition State 1	• Mature
Condition State 2	• Sparse Regenerating Understorey

Justification of PCT Selection	A mature native canopy dominated by *Corymbia gummifera* and *Angophora costata* over a taller midstratum including *Allocasuarina littoralis* and a midstratum shrub layer including *Acacia ulicifolia*, *Dodonaea triquetra* and *Banksia spinulosa*. The ground layer includes *Dianella caerulea*, *Lomandra longifolia*, *Entolasia stricta* and *Pteridium esculentum*.
Alignment with TECs	No associated TECs
Photo	• **Plate 2** • **Plate 3**

4.3 Threatened Ecological Communities

No PCTs within the Subject Land are associated with a TEC.

Plate 2. Representative photo of PCT 3592: Mature within the Subject Land taken within BAM Plot 1

Plate 3. Representative photo of PCT 3592: Sparse Regenerating Understorey within the Subject Land taken within BAM Plot 2. This image depicts a planted native canopy of *Casuarina glauca* over a weed infested, infill planted groundlayer with occasional, sparse native self-sown fragments.

4.4 Vegetation Zones

Two native vegetation zones were identified within the Subject Land:

- PCT 3592: Mature
- PCT 3592: Sparse Regenerating Understorey

PCT 3592: Mature contains three management zones:

- Complete Removal
- Canopy Removal Only
- Understory Removal Only

4.4.1 Patch Size

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

- occurs on the development site or biodiversity stewardship site, and
- includes native vegetation that has a gap of less than 100m from the next area of moderate to good condition native vegetation (or ≤30m for non-woody ecosystems).

Patch size may extend onto adjoining land that is not part of the development site (OEH 2020a). Patch size was calculated according to the above guidelines. The Subject Property has canopy connectivity (i.e. gaps of less than 100m) to substantial remnant native vegetation to the west and maintains substantial connectivity with remnant vegetation in the locality. As such, Land Eco confirmed the Subject Land must be assessed under the >100 ha patch size category (**Figure 4**).

For the purpose of the report and the BAM calculator we have assumed 262 ha patch size which is the vegetation cover in the 1500m buffer area. The actual patch size is likely to be substantially larger than this, however there is little point quantifying the full extent since we can confirm that the development must be assessed under the >100 ha patch size category (**Figure 4**).

Table 9. Vegetation Zones and Patch Sizes

Vegetation zone ID	Management Zone	PCT ID number and name	Condition / other defining feature	Area (ha)	Patch size class (select multiple if areas of native vegetation are discontinuous)	Number of vegetation integrity plots required	Number of vegetation integrity plots completed	Number of vegetation integrity plots used in assessment	Plot IDs of vegetation integrity plots used in assessment
Mature	Complete Removal	PCT 3592 - Sydney Coastal Enriched Sandstone Forest	Removal of vegetation across all stratums.	0.39	☐ <5 ha ☐ 5–24 ha ☐ 25–100 ha ☒ >100 ha	1	1	1	Plot 1
	Understorey Removal Only	PCT 3592 - Sydney Coastal Enriched Sandstone Forest	Removal of understorey vegetation	0.01	☐ <5 ha ☐ 5–24 ha ☐ 25–100 ha ☒ >100 ha				

Vegetation zone ID	Management Zone	PCT ID number and name	Condition / other defining feature	Area (ha)	Patch size class (select multiple if areas of native vegetation are discontinuous)	Number of vegetation integrity plots required	Number of vegetation integrity plots completed	Number of vegetation integrity plots used in assessment	Plot IDs of vegetation integrity plots used in assessment
	Canopy Removal Only	PCT 3592 - Sydney Coastal Enriched Sandstone Forest	Removal of canopy overhang vegetation	0.02	☐ <5 ha ☐ 5–24 ha ☐ 25–100 ha ☒ >100 ha				
Sparse Regenerating Understorey	N/A	PCT 3592 - Sydney Coastal Sandstone Gully Forest	Complete Removal	0.09	☐ <5 ha ☐ 5–24 ha ☐ 25–100 ha ☒ >100 ha	1	1	1	Plot 2

4.5 Vegetation Integrity (Vegetation Condition)

4.5.1 Vegetation Integrity Survey Plots

A total of two (2) BAM Vegetation Integrity Score (VIS) Plots were sampled within the Subject Land (**Figure 10**):

- One (1) irregular shaped plot was sampled in the 'PCT 3592: Mature' zone
- One (1) irregular shaped plot was sampled in the 'PCT 3592: Sparse Regenerating Understorey' zone

Plot data gathered for each attribute used to assess the function of the Subject Land vegetation is detailed in **Appendix C.**

4.5.2 Vegetation Integrity Scores

Vegetation Integrity Survey Scores, represented by existing vegetation within each vegetation zone, are detailed in **Table 10.**

The future VIS Score of 'PCT 3592: Sparse Regenerating Understorey' post development has been assigned to zero, equating to total clearing.

'PCT 3592: Mature' has been split between two management zones:

- Complete Removal: The future VIS Score has been assigned to zero, equating to total clearing.
- Understorey Removal Only: The future VIS score has been assigned to 21, reflecting the retention of all tree species and canopy cover and impacts only to the understorey (ie. everything except tree diversity and cover assigned to zero)
- Canopy Removal Only: The future VIS score has been assigned to 41.9, reflecting the removal of canopy cover only (ie. tree diversity and cover assigned to zero).

In accordance with section 9.2. of the BAM (DPIE 2020a) if, during the assessment of biodiversity values for any type of development, clearing or biodiversity certification proposal, the assessor determines that:

(a) an area of land does not contain native vegetation, or

(b) a vegetation zone has a vegetation integrity score <15 where the PCT is representative of an endangered or critically endangered ecological community, or

(c) a vegetation zone has a vegetation integrity score <17 where the PCT is associated with threatened species habitat (as represented by ecosystem credits), or is representative of a vulnerable ecological community, or

(d) a vegetation zone has a vegetation integrity score <20 where the PCT is not representative of a TEC or associated with threatened species habitat then for that vegetation zone:

(e) assessment of native vegetation is not required beyond Section 5.4, and

An offset is not needed for impacts on native vegetation if the vegetation integrity score is below those listed in subsection 9.2.1(1.) of the BAM (see above) as is the case for 'PCT 3592: Sparse Regenerating Understorey'; however, if the entity is at risk of an SAII the assessor will need to address the relevant criteria in Section 9.1 of the BAM and include this in the BDAR.

4.5.3 Scores

Table 10. Vegetation Integrity Scores

Vegetation zone ID	Management Zone	Composition condition score	Structure condition score	Function condition score (where relevant)	Vegetation integrity score	Hollow bearing trees present?
PCT 3592: Mature	Complete Removal	89	39.3	100	70.5	No
	Understorey Removal Only	89	39.3	100	70.5	No
	Canopy Removal Only	89	39.3	100	70.5	No
PCT 3592: Sparse Regenerating Understorey	N/A	3.4	0	30	4.7	No

4.5.4 Use of Benchmark Data

The benchmark data was sourced from the BAMC (OEH 2025). No alternative benchmark data was utilised in preparing this report.

Figure 10. BAM Plot Surveys undertaken within the Subject Land by Land Eco

Figure 11. Survey Effort undertaken by Land Eco. Remnant vegetation adjacent to Subject Property was surveyed to maximise the likelihood of detecting threatened species if present that are also likely to occasionally utilise the vegetation within the Subject Land. Ecologist transect have a spatial error of 1 – 20m.

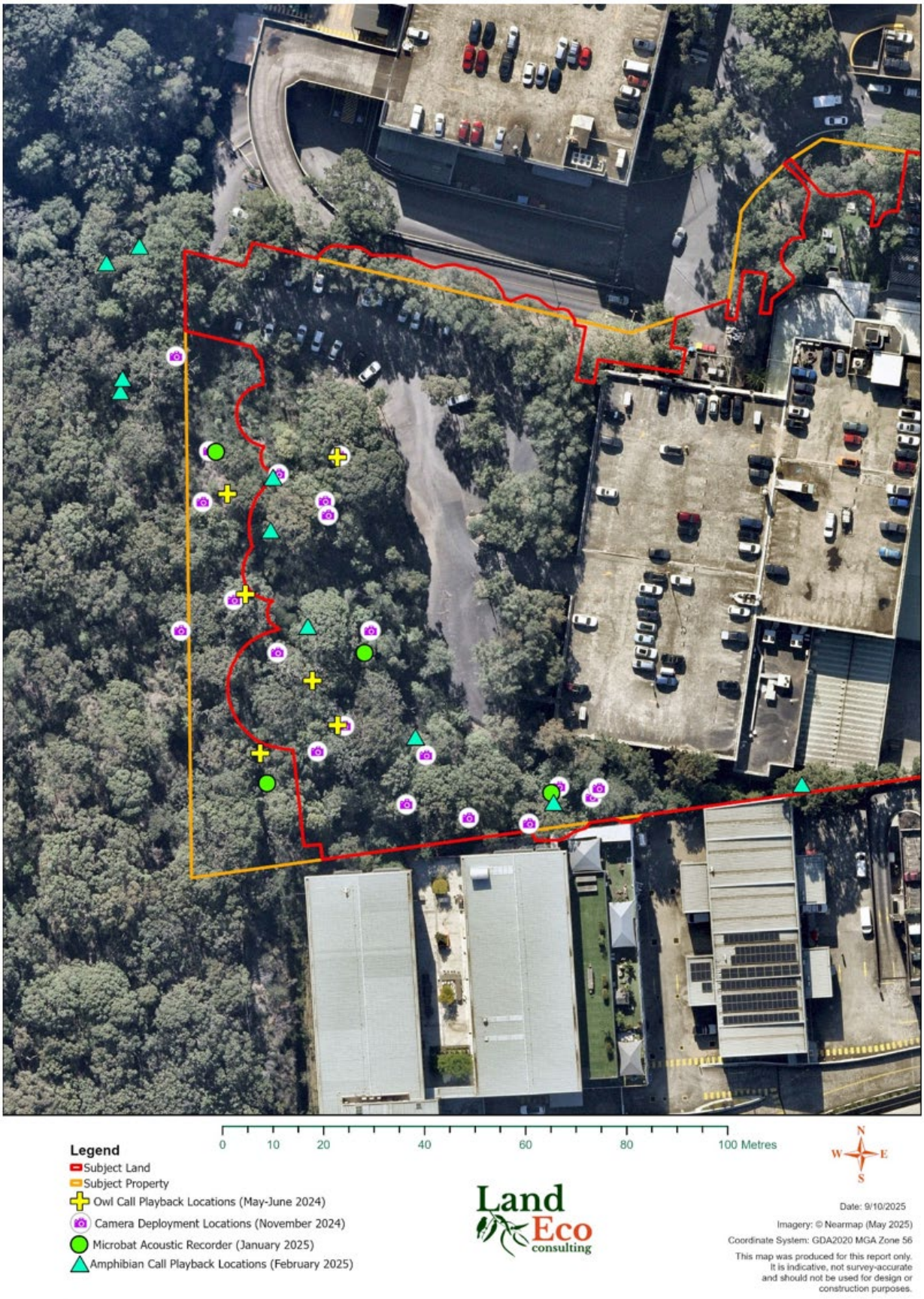

Figure 12. Fauna Survey Effort undertaken by Land Eco. Remnant vegetation within and adjacent to Subject Property (with public access) was surveyed to maximise the likelihood of detecting threatened species if present that are also likely to occasionally utilise the vegetation within the Subject Land.

Figure 13. Field validated vegetation mapping within the Subject Land

Figure 14. Trees to be retained/removed for the proposed development

5. Habitat Suitability for Threatened Species

5.1 Identification of Threatened Species for Assessment

5.1.1 Ecosystem Credit Species

This section provides a summary of the candidate Ecosystem Credit Species for the Subject Land derived from BAMC (OEH 2025c) and a 10km BioNet Atlas Search (NSW DCCEEW 2025b). Ecosystem credit species associated with the Subject Land are listed below in **Table 11.**

Table 11. Predicted ecosystem credit species

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Regent Honeyeater (Foraging)	*Anthochaera phrygia*	Critically Endangered	Critically Endangered	Yes	☐ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
Dusky Woodswallow	*Artamus cyanopterus cyanopterus*	Vulnerable	-	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
Sanderling (Foraging)	*Calidris alba*	Vulnerable	-	Yes	☐ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
Red Knot (Foraging)	*Calidris canutus*	-	Endangered	Yes	☐ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Curlew Sandpiper (Foraging)	*Calidris ferruginea*	Critically Endangered	Critically Endangered	Yes	☐ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
Great Knot (Foraging)	*Calidris tenuirostris*	Vulnerable	Vulnerable	Yes	☐ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
Gang-gang Cockatoo (Foraging)	*Callocephalon fimbriatum*	Endangered	Endangered	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
South-eastern Glossy Black-Cockatoo (Foraging)	*Calyptorhynchus lathami lathami*	Vulnerable	Vulnerable	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
Lesser Sand-plover (Foraging)	*Charadrius mongolus*	Vulnerable	Endangered	Yes	☐ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
Brown Treecreeper (eastern subspecies)	*Climacteris picumnus victoriae*	Vulnerable	Vulnerable	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
Varied Sittella	*Daphoenositta chrysoptera*	Vulnerable	-	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Spotted-tailed Quoll	*Dasyurus maculatus*	Vulnerable	Endangered	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
Beach Stone-curlew (Foraging)	*Esacus magnirostris*	Critically Endangered	-	Yes	☐ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
Eastern False Pipistrelle	*Falsistrellus tasmaniensis*	Vulnerable	-	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
Little Lorikeet	*Glossopsitta pusilla*	Vulnerable	-	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
White-bellied Sea-Eagle (Foraging)	*Haliaeetus leucogaster*	Vulnerable	-	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
Little Eagle (Foraging)	*Hieraaetus morphnoides*	Vulnerable	-	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
White-throated Needletail	*Hirundapus caudacutus*	Vulnerable	Vulnerable	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☒ Current survey	Yes	N/A	PCT 3592: Mature

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Black Bittern	*Ixobrychus flavicollis*	Vulnerable	-	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
Swift Parrot (Foraging)	*Lathamus discolor*	Endangered	Critically Endangered	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
Square-tailed Kite (Foraging)	*Lophoictinia isura*	Vulnerable	-	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
Black-chinned Honeyeater (eastern subspecies)	*Melithreptus gularis gularis*	Vulnerable	-	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
Eastern Coastal Free-tailed Bat	*Micronomus norfolkensis*	Vulnerable	-	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
Little Bent-winged Bat (Foraging)	*Miniopterus australis*	Vulnerable	-	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
Large Bent-winged Bat (Foraging)	*Miniopterus orianae oceanensis*	Vulnerable	-	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Turquoise Parrot	*Neophema pulchella*	Vulnerable	-	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
Eastern Curlew (Foraging)	*Numenius madagascariensis*	Critically Endangered	Critically Endangered	Yes	☐ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
Eastern Osprey (Foraging)	*Pandion cristatus*	Vulnerable	-	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
Scarlet Robin	*Petroica boodang*	Vulnerable	-	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
Flame Robin	*Petroica phoenicea*	Vulnerable	-	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
Golden-tipped Bat	*Phoniscus papuensis*	Vulnerable	-	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
Grey-headed Flying-fox (Foraging)	*Pteropus poliocephalus*	Vulnerable	Vulnerable	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Superb Fruit-Dove	*Ptilinopus superbus*	Vulnerable	-	No	☐ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*	Vulnerable	-	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
Greater Broad-nosed Bat	*Scoteanax rueppellii*							
Little Tern (Foraging)	*Sternula albifrons*	Endangered	-	Yes	☐ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
Rosenberg's Goanna	*Varanus rosenbergi*	Vulnerable	-	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature

5.1.2 Species Credit Species

This section provides a summary of the candidate Species Credit flora/fungi (**Table 12**) and fauna species (**Table 13**) for the Subject Land derived from BAMC (OEH 2025c) and a 10km BioNet Atlas Search (NSW DCCEEW 2025b). A summary of the targeted survey effort applied to each species is provided along with the results of the survey effort, specifically whether or not the Species Credit needs to be offset through retiring of Biodiversity Offset Credits. Where a species is assumed to be present on the Subject Land, the species polygon must encompass the entire vegetation zone/s within which the candidate species is predicted to use/occur.

The assessor must determine an offset for the impacts of proposals on the habitat of threatened species assessed for ecosystem credits and associated with a PCT in a vegetation zone with a vegetation integrity score of ≥17. The assessor must determine an offset for the impacts of proposals on threatened species that require species credits, identified in accordance with Chapter 5 of the BAM (DPIE 202a).

Table 12. Predicted flora/fungi species credit species

Common name	Scientific name	Listing status		Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act				
-	*Deyeuxia appressa*	Endangered	Endangered	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
Bauer's Midge Orchid	*Genoplesium baueri*	Endangered	Endangered	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
-	*Haloragodendron lucasii*	Endangered	Endangered	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No	Subject Land contains no seepage zone or within 100 m.	N/A
Julian's Hibbertia	*Hibbertia spanantha*	Critically Endangered	Critically Endangered	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
-	*Hygrocybe reesiae*	Vulnerable	-	☐ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature

Common name	Scientific name	Listing status		Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act				
Deane's Paperbark	*Melaleuca deanei*	Vulnerable	Vulnerable	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
Hairy Geebung	*Persoonia hirsuta*	Endangered	Endangered	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
Seaforth Mintbush	*Prostanthera marifolia*	Critically Endangered	Critically Endangered	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
Eastern Australian Underground Orchid	*Rhizanthella slateri*	Vulnerable	Endangered	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature

Table 13. Predicted Fauna Species Credit Species

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Regent Honeyeater (Breeding)	*Anthochaera phrygia*	Critically Endangered	Critically Endangered	Yes	☐ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	No	Subject Land not mapped on the Important Habitat Map.	N/A
Curlew Sandpiper (Breeding)	*Calidris ferruginea*	Critically Endangered	Critically Endangered	Yes	☐ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	No	Subject Land not mapped on the Important Habitat Map.	N/A

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Loggerhead Turtle	*Caretta caretta*	Endangered	Endangered	No	☐ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	No	No elevated sand dunes above watertable and high tide.	N/A
Large-eared Pied Bat	*Chalinolobus dwyeri*	Vulnerable	Vulnerable	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
Leatherback Turtle	*Dermochelys coriacea*	Endangered	Endangered	No	☐ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	No	No elevated sand dunes above watertable and high tide.	N/A
Beach Stone-curlew (Breeding)	*Esacus magnirostris*	Critically Endangered	-	Yes	☐ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	No	Not associated with PCT 3592. No suitable coastal sandy habitat.	N/A
Swift Parrot (Breeding)	*Lathamus discolor*	Endangered	Critically Endangered	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No	Subject Land not mapped on the Important Habitat Map.	N/A
Little Bent-winged Bat (Breeding)	*Miniopterus australis*	Vulnerable	-	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No	No 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;	N/A

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
							or from the scientific literature	
Large Bent-winged Bat (Breeding)	*Miniopterus orianae oceanensis*	Vulnerable	-	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No	No 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/A
Sooty Owl (Breeding)	*Tyto tenebricosa*	Vulnerable	-	No	☐ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature
Eastern Cave Bat	*Vespadelus troughtoni*	Vulnerable	-	No	☐ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	Yes	N/A	PCT 3592: Mature

5.2 Presence of Candidate Species Credit Species

The presence or absence of candidate species credit species are presented below (**Table 14; Table 15**).

Table 14. Determine the presence of candidate flora species credit species on the Subject Land

Common Name	Scientific Name	Listing Status		Method used to Determine Presence	Present?	Further assessment required? (BAM Subsections 5.2.5 and 5.2.6)
		BC Act	EPBC Act			
-	*Deyeuxia appressa*	Endangered	Endangered	Targeted threatened species survey	No	No
Bauer's Midge Orchid	*Genoplesium baueri*	Endangered	Endangered	Targeted threatened species survey	No	No
Julian's Hibbertia	*Hibbertia spanantha*	Critically Endangered	Critically Endangered	Targeted threatened species survey	No	No
-	*Hygrocybe reesiae*	Vulnerable	-	Targeted threatened species survey	No	No
Deane's Paperbark	*Melaleuca deanei*	Vulnerable	Vulnerable	Targeted threatened species survey	No	No
Hairy Geebung	*Persoonia hirsuta*	Endangered	Endangered	Targeted threatened species survey	No	No
Seaforth Mintbush	*Prostanthera marifolia*	Critically Endangered	Critically Endangered	Targeted threatened species survey	No	No
Eastern Australian Underground Orchid	*Rhizanthella slateri*	Vulnerable	Endangered	Targeted threatened species survey	No	No

Table 15. Determine the presence of candidate fauna species credit species on the Subject Land

Common name	Scientific name	Listing status		Method used to determine presence	Present?	Further assessment required? (BAM Subsections 5.2.5 and 5.2.6)
		BC Act	EPBC Act			
Large-eared Pied Bat	*Chalinolobus dwyeri*	Vulnerable	Vulnerable	Targeted threatened species survey	No	No
Sooty Owl	*Tyto tenebricosa*	Vulnerable	-	Targeted threatened species survey	No	No
Eastern Cave Bat	*Vespadelus troughtoni*	Vulnerable	-	Targeted threatened species survey	No	No

5.3 Candidate Species Credit Species

The survey methods for the candidate flora and fauna species credit species is presented below (**Table 16; Table 17**).

Two threatened species were recorded on or near the Subject Land by Land Eco however these occurrences were all Ecosystem Credit species, not Species Credit species:

- Grey-headed Flying-Fox (*Pteropus policocephalus*) (foraging): Single individual observed flying over the Subject Land. No roosting colonies observed. Thus, ecosystem foraging credit only.
- White-throated Needletail (*Hirundapus caudacutus*): Small flock observed flying high above the Subject Land. Aerial foraging only. Did not land within the Subject Property. Ecosystem credit species only.

One other threatened species (Ecosystem Credits) was possibly recorded on or near the Subject Land by Land Eco:

- Large Bent-winged Bat (*Miniopterus orianae oceanensis*) (foraging). While possible calls of this species were detected acoustically (**Appendix D**), the identification confidence is limited to the Species Group, where the call could more or less equally belong to one of two or more species, including the Large Forest Bat (Lachlan McRae Fauna Services 2025). The recordings showed low calling activity (Lachlan McRae Fauna Services 2025), suggesting the site is unlikely to support breeding.

Survey effort is displayed in **Figure 11**, **Figure 12**, **Table 16** and **Table 17**.

Table 16. Threatened species surveys for candidate flora species credit species on the Subject Land

Common name	Scientific name	Threatened flora species surveys				Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (transects or grids)	Timing of survey – within recommended period? (BAM-C / TBDC)		Effort (hours & no. people)		
-	*Deyeuxia appressa*	Transects	☒ Yes 17/12/24	☐ No	~3 hours, 2 people	No	No
Bauer's Midge Orchid	*Genoplesium baueri*	Transects	☒ Yes 20/2/25 24/2/25	☐ No	~4 hours, 1-2 people	No	No
Julian's Hibbertia	*Hibbertia spanantha*	Transects	☒ Yes 24/10/24 31/10/24 17/11/24 21/11/24 26/11/24	☐ No	~15 hours, 1-2 people	No	No
-	*Hygrocybe reesiae*	Transects	☒ Yes 28/5/24 29/5/24 30/5/24 6/6/24 13/6/24	☐ No	~8.5 hours, 1-2 people	No	No
Deane's Paperbark	*Melaleuca deanei*	Transects	☒ Yes 24/10/24 31/10/24 17/11/24 21/11/24 26/11/24	☐ No	~15 hours, 1-2 people	No	No
Hairy Geebung	*Persoonia hirsuta*	Transects	☒ Yes 24/10/24 31/10/24 17/11/24 21/11/24 26/11/24	☐ No	~15 hours, 1-2 people	No	No
Seaforth Mintbush	*Prostanthera marifolia*	Transects	☒ Yes 24/10/24 31/10/24 17/11/24 21/11/24 26/11/24	☐ No	~15 hours, 1-2 people	No	No
Eastern Australian Underground Orchid	*Rhizanthella slateri*	Transects	☒ Yes 24/10/24 31/10/24 17/11/24 21/11/24 26/11/24	☐ No	~15 hours, 1-2 people	No	No

Table 17. Threatened species surveys for candidate fauna species credit species on the Subject Land

Common name	Scientific name	Threatened fauna species surveys				Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (e.g. harp trap, Elliott trap, bioacoustics, etc.)	Timing of survey – within recommended period? (BAM-C / TBDC)		Effort (hours & no. people)		
Large-eared Pied Bat	*Chalinolobus dwyeri*	Bioacoustics Roost Searches	☒ Yes Jan 2025	☐ No	4 nights x 4 bioacoustic recording devices	No	No
Sooty Owl	*Tyto tenebricosa*	Call playback Spotlighting	☒ Yes May 2025 June 2025	☐ No	16.5 hours, 2 people	No	No
Eastern Cave Bat	*Vespadelus troughtoni*	Bioacoustics Roost Searches	☒ Yes Jan 2025	☐ No	4 nights x 4 bioacoustic recording devices	No	No

5.4 Expert Reports

No expert reports were commissioned for this BDAR.

5.5 More Appropriate Local Data

No additional local data has been used to assess habitat suitability.

5.6 Area or Count, and Location of Suitable Habitat for a Species Credit Species (A Species Polygon)

Where a Species credit species is confirmed present or assumed to be present within the Subject Land, the assessor must assign species polygon that encompasses the entire vegetation zone(s) within which the candidate species is predicted to occur based on the correct application of the BAM (DPIE 2020a).

No Species Credit Species require retirement for the proposed development (**Table 18; Table 19**).

Table 18. Results for present species (recorded within the Subject Land)

Common name	**Scientific name**	**Biodiversity risk weighting** (BAM-C & TBDC*)	**SAII entity**** (BAM-C & TBDC)	**Habitat constraints / microhabitats present on the subject land / vegetation zone**	**Abundance – No. individual plants present on subject land** (flora with unit of measure of count)	**Extent (ha) of suitable habitat present on site** (flora or fauna with unit of measure of area)	**TBDC species specific recommendations e.g. buffers, general comments** (where relevant)	**Habitat condition** (vegetation integrity score for each vegetation zone in the polygon – area species only)
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 19. Results for EPBC Act listed species present (recorded within the Subject Land)

Common name	**Scientific name**	**Abundance – No. individual plants present on subject land** (flora with unit of measure as count)	**Extent (ha) of suitable habitat present on site** (flora or fauna with unit of measure as area)
N/A	N/A	N/A	N/A

6. Identifying Prescribed Impacts

This chapter of the report details the type and extent of impacts to biodiversity that will occur as a result of the proposed development (**Table 20**). Prescribed additional biodiversity impacts (prescribed impacts) must be assessed as part of the BOS, as per clause 6.1 of the BC Regulation. 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.

If relevant, these features must be identified on a map.

Table 20. Prescribed impacts identified

Feature	Present	Description of feature characteristics and location	Threatened entities that use, are likely to use, or are part of the habitat feature.	Describe how these features provide habitat for, or are used by, each threatened entity
Karst, caves, crevices, cliffs, rocks or other geological features of significance	☒Yes / ☐No	Rock crevices were identified within the western portion of the Subject Land, which will be impacted by the proposed development.	Ecosystem Credit Microbats (including but not restricted to Large Bent-winged Bat)	The proximal rocky crevices are likely to only be used for feeding or temporary roosting as only 'low' calling activity of microbats was recorded by bioacoustic recordings (Lachlan McRae Fauna Services 2025). The potential presence of the Large Bent-winged Bat, as indicated by bioacoustic recordings, showed 'low' calling activity (Lachlan McRae Fauna Services 2025). This species requires limestone caves for breeding which do not occur within the Subject Property.

Feature	Present	Description of feature characteristics and location	Threatened entities that use, are likely to use, or are part of the habitat feature.	Describe how these features provide habitat for, or are used by, each threatened entity
Human-made structures	☒Yes / ☐No	The Subject Land contains several existing buildings with open gutters/cavities that will be demolished.	Ecosystem Credit Microbats (including but not restricted to Large Bent-winged Bat)	These bats may roost within open cavities of these existing structures.
Non-native vegetation	☒Yes / ☐No	The Subject Land contains planted vegetation with exotic ornamentals and infested with weed species.	Mobile Ecosystem Credit Species (including but not restricted to Large Bent-winged Bat, White-throated Needletail and Grey-headed Flying-fox)	The non-native vegetation offers potential foraging habitat to a suite of ecosystem credit species.
Habitat connectivity	☒Yes / ☐No	The locality forms part of a major habitat corridor matrix for wildlife. Several obstacles disrupt the habitat connectivity in the locality including roads, along with existing industrial and commercial developments. The mature bushland within the west of the Subject Property forms a habitat corridor that connect to the adjacent reserves. The proposed development seeks to retain a portion (0.15 ha) of this habitat corridor along the western border of the Subject Property.	Mobile Ecosystem Credit Species (including but not restricted to Large Bent-winged Bat, White-throated Needletail and Grey-headed Flying-fox)	Most Ecosystem Credit Species are mobile, generalist fauna that benefit from increased foraging resources accessible through adequate habitat connectivity. The vegetation within the Subject Land provides a habitat corridor for fauna as they travel through the Brookvale township between the nearby significant vegetation in reserves in the locality.
Waterbodies, water quality and hydrological processes	☐Yes / ☒No	N/A	N/A	N/A
Wind turbine strikes (wind farm development only)	☐Yes / ☒No	N/A	N/A	N/A

Feature	Present	Description of feature characteristics and location	Threatened entities that use, are likely to use, or are part of the habitat feature.	Describe how these features provide habitat for, or are used by, each threatened entity
Vehicle strikes	☒Yes / ☐No	Low-speed shared access ways are part of the proposed development.	No threatened entities are likely to be significantly impacted by the risk of vehicle strikes. The Subject Property occurs in an area with existing roads where vehicles are highly prevalent.	N/A

Stage 2: Impact Assessment (Biodiversity Values and Prescribed Impacts)

This section of the BDAR details impacts associated with the DA, and highlights efforts the applicant has taken, or will take, to ensure the DA avoids and minimises the impacts as much as feasible.

7. Avoid and Minimise Impacts

7.1 Avoid and Minimise Direct and Indirect Impacts

7.1.1 Project Location

The proposed development has been designed to avoid and minimise indirect impacts on biodiversity values in keeping with the purposeful use of the Subject Land. The Subject Land occurs within an industrial estate, amongst warehouses, offices and carparks. The proposed development has been located within a historically cleared, weed-infested modified patch of vegetation that is surrounded by roads, existing buildings, and industrial infrastructure. No important breeding habitat for any SAII species will be directly impacted for the proposed development.

7.1.2 Project Design

The development footprint has been strategically designed to minimise ecological impacts by prioritising areas that have been previously disturbed. As such, the majority of the proposed development is located on existing hardstand surfaces, built structures, and managed garden beds. This approach reduces the need to clear intact native vegetation and helps to preserve ecological values on-site. A total of 0.35 ha of planted vegetation will be impacted by the proposed development.

The proposed development will not affect any areas of old growth remnant native vegetation, as all vegetation proposed for removal are either planted or regenerating following historical disturbance/clearing.

The proposed design incorporates the retention of approximately 0.15 ha of PCT 3592 along the western boundary, including mature native trees and proposes the retention of several planted native trees surrounding the proposed development footprint (Reid Campbell 2025; Urban Arbor 2025). This retained vegetation helps maintain the existing habitat corridor that follows the western edge of the Subject Property. The retained area of PCT 3592 will remain in a structurally intact condition, supporting ongoing ecological connectivity and habitat values within the local landscape.

7.2 Avoid and Minimise Prescribed Impacts

7.2.1 Project Location

Impacts from clearing native vegetation and threatened species habitat can be avoided or minimised by locating the proposal in areas as detailed (**Table 21**). When selecting a proposal's location, all of the following should be analysed. Justification for the decisions in determining the final location must be based on consideration of the items listed in **Table 21**.

Table 21. Measures to locate the proposal to avoid or minimise direct and indirect impacts on native vegetation, threatened species, threatened ecological communities and their habitat

How has the proposal been located in areas lacking biodiversity values?	The Subject Land occurs within an industrial estate, amongst warehouses, offices and carparks. The proposed development has been located within a historically cleared, weed-infested modified patch of vegetation that is surrounded by roads, existing buildings, and industrial infrastructure. The proposal has been carefully located in areas with low biodiversity value by prioritising development on previously disturbed land, including existing hardstand surfaces, built structures, and managed garden beds. This approach minimises impacting higher quality vegetation representative of PCT 3592. All vegetation proposed for removal is either planted or regenerating, with no old growth remnant native vegetation affected by the development. At the time of preparing this report, the Subject Land does not contain land mapped as a 'Biodiversity Value' (**Figure 2**) (NSW DCCEEW 2025d).
How has the proposal has been located in areas where the native vegetation or threatened species habitat is in the poorest condition (i.e. areas that have a low vegetation integrity score)?	The proposal has been carefully located in areas with low biodiversity value by prioritising development on previously disturbed land, including existing hardstand surfaces, built structures, and managed garden beds. A total of 0.35 ha of planted vegetation will be impacted by the proposed development. The proposed development will impact 0.42 ha of 'mature' PCT 3592 (70.5 VI score) and 0.09 ha of 'sparse regenerating understorey' PCT 3592 (VI score 4.7). The proposed design incorporates however the retention of approximately 0.15 ha of PCT 3592 along the western boundary, including mature native trees that is likely to have a similar VI Score as 'mature' PCT 3592. This retained vegetation helps maintain the existing habitat corridor that follows the western edge of the site. The retained area will remain in a structurally intact condition, supporting ongoing ecological connectivity and habitat values within the local landscape. The proposed development is an improvement from earlier designs which incorporated a more extensive development area over a larger area of bushland. The current design is significantly reduced from previous designs, this was guided by Land Eco, through the undertaking of an Ecological Constraints assessment, which was provided to the applicant to guide their design and planning process.
How does the proposal avoid habitat for species with a high biodiversity risk weighting or land mapped on the important habitat map, or native vegetation that is a TEC or a highly cleared PCT.	The proposed development will impact 0.51 ha of PCT 3592. This PCT is not however associated with any TEC. The development will therefore not impact any threatened vegetation communities. While the Grey-headed Flying-fox, the White-throated Needletail and potentially the Large Bent-winged Bat was recorded present, the proposed development will not impact habitat that is important to the persistence of these species in the locality. No land mapped on the 'Important Habitat Map' is present within the Subject Land.
Has the proposal been located outside of the buffer area around breeding habitat features such as nest trees or caves?	No important breeding habitat was identified within the Subject Land. No nest trees, large-sized hollows or caves will be removed for the proposed development.
Has the proposal sought alternative:	
• **modes or technologies that would avoid or minimise impacts on biodiversity values**	N/A
• **routes that would avoid or minimise impacts on biodiversity values**	Site access will remain along Old Pittwater Road. The adjacent road north of the Subject Land will continue to provide access to the rear of the property (proposed Lot C) (**Figure 3**). An additional road is proposed through the centre of the Subject Property via Old Pittwater Road. This road is proposed entirely on existing hardstand surfaces, built structures, and managed garden beds, minimising un-necessary vegetation removal. The proposed development has been designed to connect existing roads, and other infrastructure to minimise vegetation removal. Access routes and stockpiles must avoid impacts on native vegetation to be retained.

• locations that would avoid or minimise impacts on biodiversity values	The Subject Land occurs within an industrial estate, amongst warehouses, offices and carparks. The proposed development has been located within a historically cleared, weed-infested modified patch of vegetation that is surrounded by roads, existing buildings, and industrial infrastructure. No highly valuable foraging or breeding habitat will be directly impacted by the proposed development.
• sites within a property on which the proposal is located that would avoid or minimise impacts on biodiversity values.	The proposed development has been located within a historically cleared, weed-infested modified patch of vegetation that is surrounded by roads, existing buildings, and industrial infrastructure. The development footprint has been strategically designed to minimise ecological impacts by prioritising areas that are disturbed. As such, the majority of the proposed development is located on existing hardstand surfaces, built structures, and managed garden beds. No caves or other important breeding habitat will be directly impacted by the proposed development.
Detail the site constraints that have contributed to selecting this location	
• bushfire protection requirements, including clearing for asset protection zones	The majority of the Subject Land contains mapped 'Bushfire Prone Land'. The proposed development will remove vegetation, decreasing fire risk. The potential for fire to occur within the buildings will be reduced through appropriate bushfire resistant construction and management.
• flood planning levels	The Subject Property does not contain any land mapped on the Flood Planning Map.
• servicing constraints.	The Subject Property is located in a suitable locality for all relevant servicing constraints. The proposed development will utilise the existing roads, and council services (e.g. sewage and rubbish collection).

7.2.2 Project Design

This BDAR documents the reasonable measures taken by the proponent to avoid or minimise clearing of native vegetation and threatened species habitat during proposal design, including placement of temporary and permanent ancillary construction and maintenance facilities (**Table 22**).

The proposed development has been designed to avoid and minimise avoid significant prescribed impacts on any threatened entities.

Table 22. Design the proposal to avoid or minimise direct and indirect impacts on native vegetation, threatened species, threatened ecological communities and their habitat

Efforts to reduce the proposal's clearing footprint by minimising the number and type of facilities	The proposal has been carefully located in areas with low biodiversity value by prioritising development on disturbed land, including existing hardstand surfaces, built structures, and managed garden beds. The proposed design incorporates the retention of approximately 0.15 ha of PCT 3592 along the western boundary, including mature native trees and proposes the retention of several planted native trees surrounding the proposed development footprint (Reid Campbell 2025) (Urban Arbor 2025).
Efforts to locate ancillary facilities in areas that have no biodiversity values	The proposal has been carefully located in areas with low biodiversity value by prioritising development on previously disturbed land, including existing hardstand surfaces, built structures, and managed garden beds. At the time of preparing this report, the Subject Land does not contain land mapped as a 'Biodiversity Value' (**Figure 2**) (NSW DCCEEW 2025d).
Efforts to locate ancillary facilities in areas where the native vegetation or threatened species habitat is in the poorest condition (i.e. areas with the lowest vegetation integrity scores)	Site access will remain along Old Pittwater Road. The adjacent road north of the Subject Land will continue to provide access to the rear of the property (proposed Lot C) (**Figure 3**). An additional road is proposed through the centre of the Subject Property via Old Pittwater Road. This road is proposed entirely on existing hardstand surfaces, built structures, and managed garden beds minimising un-necessary vegetation removal. The proposed development has been designed to connect existing roads, and other infrastructure to

	minimise vegetation removal. Access routes and stockpiles must avoid impacts on native vegetation to be retained.
Efforts to locate ancillary facilities in areas that avoid habitat for species and vegetation that has a high threat status (e.g. an endangered ecological community (EEC) or critically endangered ecological community (CEEC) or is an entity at risk of a serious and irreversible impact (SAII)	The proposed development will impact 0.51 ha of PCT 3592. This PCT is not however associated with any TEC. The development will therefore not impact any threatened vegetation communities. The proposal has been carefully located in areas with low biodiversity value by prioritising development on previously disturbed land, including existing hardstand surfaces, built structures, and managed garden beds. While the Grey-headed Flying-fox, the White-throated Needletail and potentially the Large Bent-winged Bat was recorded present, the proposed development will not impact habitat that is important to the persistence of these species in the locality. No caves or other important breeding habitat will be directly impacted by the proposed development.
Actions and activities that provide for rehabilitation, ecological restoration and/or ongoing maintenance of retained areas of native vegetation, threatened species, threatened ecological communities and their habitat on the subject land.	The proposed design incorporates the retention of approximately 0.15 ha of PCT 3592 along the western boundary, including mature native trees and proposes the retention of several planted native trees surrounding the proposed development footprint (Reid Campbell 2025) (Urban Arbor 2025). This retained vegetation helps maintain the existing habitat corridor that follows the western edge of the site. The retained area of PCT 3592 will remain in a structurally intact condition, supporting ongoing ecological connectivity and habitat values within the local landscape.

8. Impact Assessment

8.1 Direct Impacts

In accordance with section 8 of the BAM, the assessor must determine the direct impacts on threatened entities and their habitat. The BDAR must include an assessment of the impacts of the proposal on threatened entities and their habitat, and describe the direct impacts of the proposal on native vegetation, TECs and threatened species habitat.

8.1.1 Residual Direct Impacts

While all effort has been taken to avoid and minimise impacts, residual impacts will occur as a result of the proposed development. A summary of the residual impacts upon PCT and threatened species is presented in **Table 23**. These impacts are unlikely to have an adverse impact on any threatened species.

Table 23. Summary of residual direct impacts

Direct impact (Describe the impact on PCT/TEC/EC or threatened species and their habitat)	**BC Act status**	**EPBC Act status**	**SAII entity**	**Project phase/timing of impact** (e.g. construction, operation, rehabilitation)	**Extent** (ha, number of individuals)
PCT 3592: Sydney Coastal Enriched Sandstone Forest	-	-	No	Construction, Operation	0.42 ha
Ecosystem credit species	Vulnerable	Not Listed, Vulnerable	No	Construction, Operation	0.51 ha of vegetation (potential foraging and roosting habitat), several human-made structures (potential temporary roosting habitat)

8.1.2 Change in Vegetation Integrity Scores

The change in VIS from the proposed development across all vegetation zones is presented (**Table 24**).

Table 24. Impacts to vegetation integrity

Vegetation zone	**PCT ID**	**Management zone**	**Area (ha)**	**Before development**				**After development**				**Change**
				Composition	Structure	Function	VI score	Composition	Structure	Function	VI score	Change in VI score
Mature	3592	Complete Removal	0.39	89	39.3	100	70.5	0	0	0	0	-70.5
		Understorey Removal Only	0.01	89	39.3	100	70.5	8.8	21.1	50	21	-49.5
		Canopy Removal Only	0.02	89	39.3	100	70.5	80.3	18.3	50	41.9	-28.6
Sparse Regenerating Understorey	3592	N/A	0.09	3.4	0	30	4.7	0	0	0	0	-4.7

8.2 Indirect Impacts

A detailed summary of residual indirect impacts to threatened entities is provided in **Table 25.**

Table 25. Summary of residual indirect impacts

Indirect impact (Describe impact, e.g. transport of weeds and pathogens form the site to adjacent vegetation)	Impacted entities (PCT/threatened entity and their habitats and where relevant, EPBC Act listing)	Extent (ha or zone reference)	Frequency	Duration (long-term/ short-term/ medium-term)	Project phase/ timing of impact (e.g. construction, operation, rehabilitation)	Likelihood and consequences
(a) inadvertent impacts on adjacent habitat or vegetation	Mobile Ecosystem Credit Species (including but not restricted to the Large Bent-winged Bat, White-throated Needletail and Grey-headed Flying-fox) PCT 3592	Vegetation to be retained within the Subject Land and adjacent vegetation	During Construction and Ongoing	Long-term	Construction, Operation	Tree protection zones and no-go areas will minimise the potential for clearing of adjacent vegetation. In the unlikely event adjacent vegetation is cleared on accident, it is unlikely that this would cause significant impacts to threatened ecological communities or threatened species. The locality is already highly developed, as such the impact is unlikely to be significant. The proposed development has the potential to result in soil disturbance impacting adjacent vegetation including increased stormwater runoff and soil sedimentation, however erosion and sedimentation controls will adequately mitigate these impacts.
(b) reduced viability of adjacent habitat due to edge effects	Mobile Ecosystem Credit Species (including but not restricted to the Large Bent-winged Bat, White-throated Needletail and Grey-headed Flying-fox) PCT 3592	Vegetation adjacent to Subject Land	During Construction and Ongoing	Long-term	Construction, Operation	The Subject Land and adjacent habitat is already impacted due to edge effects from the existing land usage and surrounding industrial land uses including weed infestation, gross pollutants and litter. While the proposed development has the potential to exacerbate these impacts, this is unlikely to substantially reduce the viability of adjacent habitat beyond its current condition.
(c) reduced viability of adjacent habitat due to noise, dust or light spill	Mobile Ecosystem Credit Species (including but not restricted to the Large Bent-winged Bat, White-throated Needletail and Grey-headed Flying-fox)	Vegetation adjacent to Subject Land	During Construction and Ongoing	Long-term	Construction, Operation	The proposed development may result in the increase of noise, dust or light spill associated with the construction activities and operation of the facilities. However, the Subject Property is already impacted from noise and light spill from the existing land usage, and surrounding

Indirect impact (Describe impact, e.g. transport of weeds and pathogens form the site to adjacent vegetation)	Impacted entities (PCT/threatened entity and their habitats and where relevant, EPBC Act listing)	Extent (ha or zone reference)	Frequency	Duration (long-term/ short-term/ medium-term)	Project phase/ timing of impact (e.g. construction, operation, rehabilitation)	Likelihood and consequences
	PCT 3592					industrial land uses and roads. The proposed development is unlikely to exacerbate this reality beyond the current condition.
(d) transport of weeds and pathogens from the site to adjacent vegetation	PCT 3592	Vegetation adjacent to Subject Land	During Construction and Ongoing	Long-term	Construction, Operation	The proposed development will result in soil disturbance on the Subject Land which may result in the propagation and spread of weed propagules from the soil bank to parts of the retained and adjacent vegetation. The Subject Land and adjacent vegetation are already weed-infested with high threat exotic weed. There is the potential for the construction vehicles to transport novel weeds onto the Subject Land and surrounds however this is unlikely to exacerbate this reality beyond the current condition.
(e) increased risk of starvation, exposure and loss of shade or shelter	Mobile Ecosystem Credit Species (including but not restricted to the Large Bent-winged Bat, White-throated Needletail and Grey-headed Flying-fox) PCT 3592	Vegetation within and adjacent to Subject Land	During Construction and Operation	Short-term, Possible long-term	Construction, Operation	The proposed development will remove vegetation that may reduce shelter and increase the risk of exposure. However, this increased risk of starvation, exposure, and loss of shade or shelter is unlikely to be a significant impact at a species level as suitable habitat of a similar condition occurs adjacent and will be retained post-development.
(f) disturbance to breeding habitats	Mobile Ecosystem Credit Species (including but not restricted to the Large Bent-winged Bat)	Vegetation within and adjacent to Subject Land. Open gutters and overhangs within the existing	During Construction and Operation	Long term	Construction, Operation	Acoustic bat surveys conducted by Land Eco revealed the potential call of Large Bent-winged Bat (Lachlan McRae Fauna Services 2025). This threatened microbat may utilise the gutters and overhangs within the Subject Property for shelter or roosting, however the Large Bent-winged Bat requires limestone caves for breeding which are not present within the Subject Land. The proposed development will include direct disturbance to potential microbat roosting habitat in the existing human-made structures to be

Indirect impact (Describe impact, e.g. transport of weeds and pathogens form the site to adjacent vegetation)	Impacted entities (PCT/threatened entity and their habitats and where relevant, EPBC Act listing)	Extent (ha or zone reference)	Frequency	Duration (long-term/ short-term/ medium-term)	Project phase/ timing of impact (e.g. construction, operation, rehabilitation)	Likelihood and consequences
		buildings proposed for removal.				demolished. These structures are unlikely to provide substantial breeding habitat to any species.
(g) trampling of threatened flora species	N/A	N/A	N/A	N/A	N/A	No threatened flora was identified within the Subject Land or considered likely to occur.
(h) inhibition of nitrogen fixation and increased soil salinity	PCT 3592	Subject Property	During Construction and Operation	Long-term	Construction, Operation	The replacement of native vegetation with hardstand surfaces such as buildings and roads is likely to inhibit nitrogen fixation. The locality is already degraded so this impact is unlikely to exacerbate this reality beyond the current condition.
(i) fertiliser drift	PCT 3592	Subject Property	During Construction and Operation	Long term	Construction, Operation	The proposed development may increase fertiliser drift from garden maintenance activities associated with the proposed development. The proposed development will not adversely impact the Subject Land beyond its current condition.
(j) rubbish dumping	Mobile Ecosystem Credit Species (including but not restricted to the Large Bent-winged Bat, White-throated Needletail and Grey-headed Flying-fox) PCT 3592	Subject Property	During Construction and Operation	Short-term, Possible long-term	Construction, Operation	The Subject Land is in a highly disturbed, industrialised setting. The proposed development may inadvertently result in the stockpiling of construction waste on adjacent land and increased dumping of anthropogenic litter. The Subject Land is already subject to rubbish dumping and anthropogenic litter from existing land usage. The proposed development is unlikely to disturb the adjacent habitat significantly in this way beyond its current condition.
(k) wood collection	N/A	N/A	N/A	N/A	N/A	The Subject Land is in a highly disturbed, industrialised setting. The proposed development is unlikely to increase the prevalence of wood collection.

Indirect impact (Describe impact, e.g. transport of weeds and pathogens form the site to adjacent vegetation)	Impacted entities (PCT/threatened entity and their habitats and where relevant, EPBC Act listing)	Extent (ha or zone reference)	Frequency	Duration (long-term/ short-term/ medium-term)	Project phase/ timing of impact (e.g. construction, operation, rehabilitation)	Likelihood and consequences
(l) bush rock removal and disturbance	N/A	N/A	N/A	N/A	N/A	The Subject Land is in a highly disturbed, industrialised setting. The proposed development is unlikely to increase the prevalence of bush rock removal and disturbance.
(m) increase in predatory species populations	Mobile Ecosystem Credit Species (including but not restricted to the Large Bent-winged Bat, White-throated Needletail and Grey-headed Flying-fox)	Subject Property	Ongoing	Long-term	Construction, Operation	It is likely that predatory animals occur in high densities already as the locality is disturbed and situated in an industrial environment. The proposed development is unlikely to exacerbate this reality beyond the current condition.
(n) increase in pest animal populations	Mobile Ecosystem Credit Species (including but not restricted to the Large Bent-winged Bat, White-throated Needletail and Grey-headed Flying-fox)	Subject Property	Ongoing	Long-term	Construction, Operation	It is likely that pest animals occur in high densities already as the locality is disturbed and situated in an industrial environment. The proposed development is unlikely to exacerbate this reality beyond the current condition.
(o) increased risk of fire	Mobile Ecosystem Credit Species (including but not restricted to the Large Bent-winged Bat, White-throated Needletail and Grey-headed Flying-fox) PCT 3592	Subject Property	During Construction and Operation	Long-term	Construction, Operation	The proposed development will remove vegetation, decreasing fire risk. The potential for fire to occur within the buildings will be reduced through appropriate bushfire resistant construction and management.
(p) disturbance to specialist breeding and foraging habitat, e.g. beach nesting for shorebirds.	N/A	N/A	N/A	N/A	N/A	No specialist habitat occurs within the Subject Land.

8.3 Prescribed Impacts

This section of the report addresses impact mitigation measures for prescribed impacts.

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

The Subject Land contains rocky crevices detailed in **Table 26**.

Table 26. Residual prescribed impacts – impacts to karst, caves, crevices, cliffs, rocks or other geological features of significance

Nature	Threatened fauna or flora protected fauna that are at risk	SAII entities at risk	Likelihood	Extent	Duration	Consequences
Rock crevices were identified within the western portion of the Subject Land.	Ecosystem credit microbats (including but not restricted to Large Bent-winged Bat)	-	Low	Rock crevices were identified within the western portion of the Subject Land, which will be impacted by the proposed development.	Permanent	The identified crevices are likely to only be used for temporary shelter if anything. These crevices would not represent important breeding habitat.

8.3.2 Human-made structures

The Subject Land contains some human-made structures detailed in **Table 27.**

Table 27. Residual prescribed impacts – impacts to human-made structures

Nature	Threatened fauna or flora protected fauna that are at risk	SAII entities at risk	Likelihood	Extent	Duration	Consequences
The Subject Land contains several existing buildings with open gutters/cavities.	Ecosystem credit microbats (including but not restricted to Large Bent-winged Bat)	-	Moderate	These structures are expected to be removed/modified for the proposed development.	Permanent	The proposed development may impact temporary roosting habitat for microbats. No important breeding habitat is expected to be impacted.

8.3.3 Non-native vegetation

The Subject Land contains some non-native vegetation detailed in **Table 28.**

Table 28. Residual prescribed impacts – impacts to non-native vegetation

Nature	Threatened fauna or flora protected fauna that are at risk	SAII entities at risk	Likelihood	Extent	Duration	Consequences
The Subject Land contains planted vegetation with exotic ornamentals and infested with weed species.	Mobile Ecosystem Credit Species (including but not restricted to the Large Bent-winged Bat, White-throated Needletail and Grey-headed Flying-fox) PCT 3592	-	High	Amongst 0.77 ha of mixed native/exotic vegetation.	Permanent	The proposed development will remove this vegetation, which may provide occasional foraging habitat to a small range of mobile ecosystem credits species. This impact is unlikely to be significant for any of these species, with suitable foraging habitat remaining present nearby in Garigal National Park, Ku-ring-gai National Park and council reserves.

8.3.4 Habitat connectivity

The Subject Land contains habitat connectivity that will be impacted by the proposed development as detailed in **Table 29.**

Table 29. Residual prescribed impacts – impacts to habitat connectivity

Nature	Threatened fauna or flora protected fauna that are at risk	SAII entities at risk	Likelihood	Extent	Duration	Consequences
The locality forms part of a major habitat corridor matrix for wildlife. Major habitat corridors run through nearby Garigal National Park and Ku-ring-gai National Park with smaller habitat links connecting these corridors throughout the existing infrastructure where remnant native vegetation has been retained. Several obstacles disrupt the habitat connectivity in the locality including roads such as Warringah Road and Allambie Road, along with existing industrial and commercial developments. The mature bushland within the west of the Subject Property forms a habitat corridor that connect to the adjacent reserves. The proposed development seeks to retain a large portion (0.15 ha) of this habitat corridor along the western border of the Subject Property.	Mobile Ecosystem Credit Species (including but not restricted to the Large Bent-winged Bat, White-throated Needletail and Grey-headed Flying-fox) PCT 3592	-	Moderate	Amongst 0.77 ha of mixed native/exotic vegetation.	Permanent	The removal of habitat from the Subject Land will moderately disrupt connectivity within the Subject Land and immediate surrounds, however habitat in the locality is already fragmented and not likely to be important to threatened species populations, owing to its urban/industrial context. As such, the proposed development is unlikely to have a significant impact on habitat connectivity at the landscape level.

8.3.5 Waterbodies, water quality and hydrological processes

Not applicable.

8.3.6 Wind turbine strikes

Not applicable.

8.3.7 Vehicle strikes

Impacts from the development upon vehicle strikes is presented (**Table 30**).

Table 30. Residual prescribed impacts – impacts to vehicle strikes

Nature	Threatened fauna or flora protected fauna that are at risk	SAII entities at risk	Likelihood	Estimated vehicle strikes	Consequences
Low-speed driveways/ a road network is part of the proposed development.	Mobile Ecosystem Credit Species (including but not restricted to the Large Bent-winged Bat, White-throated Needletail and Grey-headed Flying-fox)	Nil	Low	Nil	Motor vehicles are highly prevalent in the locality along the bordering roads. The proposed development will include a low-speed limit. Threatened species are unlikely to be impacted by the negligible increase in vehicle traffic in this urbanised locality.

8.4 Mitigating residual impacts – management measures and implementation

Biodiversity impacts from the proposed development can be mitigated through implementation of the recommended mitigation measures outlined in **Table 31** in accordance with the protocol outlined in **Table 32**.

Table 31. Summary of proposed mitigation and management measures for residual impacts (direct, indirect and prescribed)

Requirement	Mitigation measure
Assigning a Project Ecologist	Prior to construction, a qualified and experienced Ecologist (>3 years of experience) with a minimum tertiary degree in science, conservation, biology, ecology, natural resource management, environmental science or environmental management will be engaged. The Ecologist must be licensed with a current Department of Primary Industries Animal Research Authority permit and New South Wales Scientific License issued under the BC Act. The Ecologist must be a member of the NSW Ecological Consultants Association. The Ecologist will be commissioned to: • Help the proponent undertake any Threatened species habitat augmentation or translocation. • Provide staff training and site briefing to communicate environmental features to be protected and measures to be implemented. • Supervise all impacts to native vegetation and fauna habitat
Tree Protection Zones	Where relevant, all trees that are not proposed to be cleared, but are located near the proposed development should be protected with appropriate tree protections as advised by a qualified Consulting Arborist in accordance with the Australian Standards. All trees to be retained must be protected in accordance with *Australian Standard - Protection of Trees on Development Sites (AS-4970-2009)*, which outlines that a Tree Protection Zone (TPZ) is the principal means of protecting trees on development sites. It is an area isolated from construction disturbance so that the tree remains viable.
Clearing of Vegetation and Fauna Habitat	Project Ecologist to undertake a pre-clearing survey of the Subject Land, identifying active hollows, threatened species and/or nests. All felling of native trees should be supervised by an Ecologist who will be available on site to capture, treat/relocate any displaced fauna. If any threatened species are identified, the Project Ecologist must be consulted to determine the best course of action, including potential translocations.
Demolition of Human-Made Structures	An experienced, vaccinated ecologist to check buildings for roosting microbats and remain present during the demolition of all human-made structures that contain microbat habitat to capture, treat/relocate and displaced fauna, particularly microbats.
Preparation of a Construction Environmental Management Plan (CEMP)	A Construction Environmental Management Plan (CEMP) will be required for the construction phase of the project and will be prepared prior to issue of the Construction Certificate. The CEMP would include, as a minimum, industry-standard measures for the management of soil, surface water, weeds and pollutants, as well as site-specific measures, including the procedures outlined below. The proposed mitigation measures would include environmental safeguards for protection of neighbouring properties and nearby waterways hygiene protocols to prevent the spread of weeds or pathogens between infected areas and uninfected areas in accordance with relevant policy documentation and Government guidelines. In order to address the potential impacts of the proposal on biodiversity, the mitigation and management measures outlined within this table would be implemented as part of the CEMP for the site.
Erosion and Sedimentation	Appropriate erosion and sediment control will be erected and maintained during construction. At minimum such measures will comply with the relevant industry guidelines such as 'the Blue Book' (Landcom 2004).
Storage and Stockpiling (Soil and Materials)	Allocate all storage, stockpile and laydown sites away from any native vegetation that is planned to be retained. Avoid importing any soil from outside the site as this can introduce weeds and pathogens to the site in order to avoid the potential of incurring indirect impacts on biodiversity values.
Management of Light, Noise and Dust from Construction	Appropriate light, noise and dust suppression methods must be implemented to reduce their impact on surrounding flora and fauna. Construction works should be limited to daylight hours where possible. Diurnal timing of construction and operational activities will reduce impacts of light spill.

Requirement	Mitigation measure
	All noise will be limited to standard daylight working hours 6am-6pm Monday to Friday, 7am-1pm Saturday. No work on Sunday.

Table 32. Implementation of the mitigation and management measures

Measure/action	Monitoring and evaluation strategy (Data, frequency, timing and reporting)	Performance criteria (linked to monitoring and evaluation strategy)	Adaptive management threshold (trigger for adaptive management plan/actions)	Adaptive management response (when triggered)
Assigning a Project Ecologist	Project Ecologist to be engaged by proponent. Ecologist to conduct a pre-clearing survey for any sensitive fauna, breeding fauna, or threatened species in the Subject Land. No less than 48 hours prior to clearing commencing. Project Ecologist to supervise all vegetation clearing.	Assigned Project Ecologist to prepare an '*Ecologist Pre-clearing Report*' to detail findings of the pre-clearing survey and results of clearing supervision.	If any tree hollows, or nesting, sensitive, or threatened fauna or flora is found, the Ecologist will prepare a strategy to maximise likelihood of safe relocation.	Relocate sensitive fauna or threatened entity. If any tree hollow is found in a tree proposed for removal, instruct an Arborist to carefully remove the hollow sections of the tree and prepare excised hollows for re-install within the Subject Land or Property.
Tree Protection	Project Arborist (Qualified Consulting Arborist) to be engaged by proponent. Tree protection fencing to be installed around any trees and other native vegetation to prevent such trees/vegetation being impacted by the proposed excavation or construction.	Project Arborist to supervise the installation of tree protection fencing. Arborist to provide letter with photographic evidence to confirm appropriate controls have been installed.	If any trees that have not been approved for clearing are accidentally cleared/harmed, or excavation works occur within the 'drip-zones' or structural root zones of trees that are to be retained on the Subject Property or neighbours property.	Stop works immediately. Qualified Consulting Arborist must be present to supervise any excavation works and provide advice to ensure such works do not harm trees on adjacent properties. The Project Ecologist will work with the Arborist to restore the vegetation cleared.
Clearing of Vegetation and Fauna Habitat	Project Ecologist to supervise all vegetation clearing.	Assigned Project Ecologist to prepare an '*Ecologist Post-clearing Report*' to detail findings of the clearing works.	N/A	N/A
Demolition of Human-Made Structures	Project Ecologist to supervise all demolition works.	Assigned Project Ecologist to prepare an '*Ecologist Post-Demolition Report*' to detail findings of the demolition works.	N/A	N/A
Erosion and Sedimentation	Appropriate Erosion and Sedimentation Controls informed by the Blue Book (Landcom 2004) to be included in a Construction Environmental Management Plan (CEMP) commissioned by the proponent.	Minimum industry standards enforced prior to and during earthworks, clearing and construction.	If controls are not properly installed or fail.	Review controls and implement new measures. Engage Earthworks Contractor, Civil or Environmental Engineer to install appropriate controls within 24 hours of the breach.
Storage and Stockpiling (Soil and Materials)	All storage and stockpiling of construction resources must be in appropriate laydown areas away from the dripline of trees that will be retained. Ensure tree and vegetation protection fencing is installed around trees /vegetation that must be protected outside the development footprint	No inadvertent impacts to habitat or vegetation.	Inadvertent impacts (e.g., accidental felling of trees or vegetation not approved for clearing) occur to adjacent vegetation as a result of improper management of construction materials.	Review controls and implement new measures. Remediate the vegetation impacted by the inadvertent impact under the guidance of the Project Ecologist.

Measure/action	Monitoring and evaluation strategy (Data, frequency, timing and reporting)	Performance criteria (linked to monitoring and evaluation strategy)	Adaptive management threshold (trigger for adaptive management plan/actions)	Adaptive management response (when triggered)
Management of Light, Noise and Dust from Construction	Restrict construction to daylight hours. Manage dust, erosion and runoff in accordance with the provisions of 'The Blue Book' (Landcom 2004). Limit the unnecessary use of flood lighting.	Control measures implemented.	Control measures ineffective, resulting in disturbance to protected flora or fauna, or disturbance to nearby landholders.	Review controls and implement new measures under guidance of Construction Contractor to adequately mitigate impacts.

8.5 Adaptive management strategy for uncertain impacts

If during the construction of the proposed development, the Project Ecologist finds that a species listed under the EPBC Act or a species at risk of an SAII has the potential to be significantly impacted, works must cease until the Project Ecologist advises on a suitable approach. This may require a referral to the Commonwealth to determine whether the proposed development will need formal assessment and approval under the EPBC Act.

9. Serious and Irreversible Impacts

9.1 Assessment for serious and irreversible impacts on biodiversity values

No entities are considered to have a significant risk of SAII from the proposed development in accordance with the 'Guidance to assist a decision-maker to determine a serious and irreversible impact' (NSW DPIE 2019) (**Table 33**).

Table 33. Entities at risk of SAII

Common name	Scientific name	Reason for inclusion in assessment
N/A	N/A	N/A

10. Impact Summary

10.1 Determine an offset requirement for impacts

10.1.1 Impacts on Native Vegetation and Threatened Ecological Communities

Impacts to native vegetation as a result of the proposed development that do not require offsetting are detailed in **Table 34**.

Table 34. Impacts that do not require offset - ecosystem credits

Vegetation zone	PCT name	TEC	Impact area (ha)	Entity at risk of an SAII?	Current VI score
Sparse Regenerating Understorey	PCT 3592: Sydney Coastal Enriched Sandstone Forest (Sparse Regenerating Understorey)	-	0.09	No	4.7
Planted Mixed Native/Exotic Vegetation	-	-	0.35	No	-

Impacts to native vegetation as a result of the proposed development that do require offsetting are detailed in **Table 35**.

Table 35. Impacts that require an offset - ecosystem credits

Vegetation zone	PCT name	TEC	Management Zone	Impact area (ha)	Current VI score	Future VI score	Change in VI score	Biodiversity risk weighting	Number of ecosystem credits required
Mature	PCT 3592: Sydney Coastal Enriched Sandstone Forest	-	Complete Removal	0.39	70.5	0	-70.5	1.75	12
			Understorey Only Removal	0.01	70.5	21	-49.5	1.75	
			Canopy Only Removal	0.02	70.5	41.9	-28.6	1.75	
			Total	0.42				Total credits	12

10.1.2 Impacts on Threatened Species and their Habitat (Species Credits)

Impacts to threatened species as a result of the proposed development that require offsetting are detailed in **Table 36**. The proposed development will not result in species credits requiring offsetting.

Table 36. Impacts that require an offset - species credits

Common name	Scientific name	BC Act status	EPBC Act status	Loss of habitat (ha) or individuals	Biodiversity risk weighting	Number of species credits required
N/A	N/A	N/A	N/A	N/A	N/A	N/A

10.1.3 Indirect and prescribed impacts

Proposed offsets for the residual indirect and prescribed impacts as a result of the proposed development are summarised in **Table 37**. The proposed development will not result in residual indirect or prescribed impacts requiring offsetting.

Table 37. Summary of proposed offsets for residual indirect and prescribed impacts

Residual indirect or prescribed impact (identified after mitigation)	Proposed offset (additional biodiversity credit requirement and/or other conservation measures)
N/A	N/A

10.2 Impacts that do not need further assessment

Impacts that do not need further assessment for ecosystem credits are detailed in **Table 38.**

Table 38. Impacts that do not need further assessment for ecosystem credits

Impact	Location within Subject Land	Justification why no further assessment is required
Removal of 0.09 ha of PCT 3592: Sparse Regenerating Understorey	**Figure 13**	Below the minimum VIS threshold identified in section 9.2 of the BAM.
Removal of 0.35 ha of Planted Mixed Native/Exotic Vegetation	**Figure 13**	As the native vegetation was planted for functional and aesthetic purposes surrounding the existing facilities within the Subject Land, it meets subsection D.1 (5.i.) of the decision tree in Appendix D of the BAM, and has been excluded from credit calculations.

11. Biodiversity Credit Report

11.1 Ecosystem credits

In accordance with section 9.2.1 of the BAM (DPIE 2020a) the assessor must determine an offset for all impacts of proposals on PCTs that are associated with a vegetation zone that has a vegetation integrity score of:

a. ≥15, where the PCT is representative of an EEC or a CEEC

b. ≥17, where the PCT is associated with threatened species habitat (as represented by ecosystem credits) or represents a vulnerable ecological community

c. ≥20, where the PCT does not represent a TEC and is not associated with threatened species habitat.

The ecosystem credits requiring retirement for the proposed development are summarised in **Table 39**.

Table 39. Ecosystem credits class and matching credit profile

Credits to Retire	Attributes shared with matching credits						
	PCT name	PCT vegetation class	PCT vegetation formation	Associated TEC or EC	Offset trading group (BAM Section 10.2, Tables 4 & 5)	Hollow bearing trees present?	IBRA subregion (in which proposal is located)
12	PCT 3592: Sydney Coastal Enriched Sandstone Forest	Sydney Coastal Dry Sclerophyll Forests	Dry Sclerophyll Forests (Shrubby sub-formation)	-	Sydney Coastal Dry Sclerophyll Forests greater than or equal to 50% and less than 70% cleared	No	Cumberland; Pittwater; Sydney Cataract; Wyong; Yengo

11.2 Species credits

In accordance with section 9.2.2 of the BAM (DPIE 2020a):

1. The assessor must determine an offset for the impacts of proposals on the habitat of threatened species assessed for ecosystem credits and associated with a PCT in a vegetation zone with a vegetation integrity score of ≥17.

2. The assessor must determine an offset for the impacts of proposals on threatened species that require species credits, identified in accordance with Chapter 5 of the BAM (DPIE 2020a).

3. The method for determining offset requirements for impacts on threatened species and threatened species habitat is described in Chapter 10 of the BAM (DPIE 2020a).

4. An offset requirement can be proposed for a prescribed impact in accordance with Section 8.6 of the BAM (DPIE 2020a).

Species credits that require offsetting for the proposed development are presented in **Table 40**.

Table 40. Species credit class and matching credit profile

Credits to Retire	Attributes shared with matching credits				
	Name of threatened species	Kingdom	BC Act status	EPBC Act status	IBRA region
N/A	N/A	N/A	N/A	N/A	N/A

12. Other Relevant Legislation, Plans & Policies Requiring Address

12.1 Warringah Local Environmental Plan 2011

The Subject Property is located in the Warringah Ward of the Northern Beaches Council and is therefore subject to the planning provisions of the Warringah LEP (2011). This section details Environmental Controls relevant to the terrestrial biodiversity associated with the Subject Land and surrounds (**Table 41**).

Table 41. Environmental controls in the Warringah LEP (2011) relevant to the terrestrial biodiversity associated with the Subject Land and surrounds.

Local Environmental Plan Reference	Application	Suitable Action
Part 2.1 Land use zones	The Subject Property is zoned 'E4 - General Industrial'.	The proposed development of a 'subdivision of existing industrial land into three industrial lots including earthworks, clearing of the site and concept built form for Lot C' is permitted with consent from Northern Beaches Council.
Part 6.2 Earthworks	The proposed development will require earthworks for the demolition of the previous dwelling, and for the construction of the new buildings within the new subdivisions.	The earthworks will not have a detrimental impact on environmental functions and processes, neighbouring uses, heritage items or features of the surrounding land. Erosion and runoff will be managed in accordance with the provisions of the industry standards outlined in 'The Blue Book' (Landcom 2004).
Part 6.3 Development on Sloping Land	The Subject Property is located on land mapped as 'Area B – Flanking Slopes 5° to 25°'.	The proposed development contains plans to infill and level the land prior to construction in order to reduce the sloping of the area. A retaining wall will also be constructed to reduce landslide risks. The Subject Property has already been somewhat artificially levelled for the previous development, so any alterations are unlikely to affect stormwater runoff and subsurface flows beyond their current state.

12.2 Warringah Development Control Plan 2011

The Subject Property is located in the Warringah Ward of the Northern Beaches Council and is therefore subject to the planning provisions of the Warringah DCP (2011). This section details Development Controls relevant to the terrestrial biodiversity within the Subject Land and surrounds (**Table 42**).

Table 42. Development controls in the Warringah DCP (2011) relevant to the terrestrial biodiversity within the Subject Land and surrounds

Control Number	Control Name	Does this control apply?	Reason	Suitable Action Proposed
E1	Preservation of Trees or Bushland Vegetation	Yes	The proposed development will result in the removal of trees from the Subject Land.	All tree removal will be conducted with permission from Northern Beach Council. Effort will be taken to avoid impacting retained vegetation within the Subject Property and the bushland adjoining the Subject Property. Arborist controls will be installed to protect trees and vegetation to be retained (Urban Arbor 2025). It has been recommended that at minimum one tree for each tree proposed to be removed is planted to maintain/increase overall canopy cover at the site when mature. Any replacement tree must be selected in accordance with AS2303-2018 Tree stock for landscape use (Urban Arbor 2025).

Control Number	Control Name	Does this control apply?	Reason	Suitable Action Proposed
E2	Prescribed Vegetation	Yes	The Subject Property is potential habitat for threatened species as listed under the NSW *Threatened Species Conservation Act 1995* (now known as the *Biodiversity Conservation Act 2016*) and/or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.	The development proposes to remove 0.77 ha of mixed native/exotic vegetation. The Subject Land is positioned to minimise clearing of the mature native community in the west portion of the Subject Property, retaining the ecological function of the wildlife corridor. The majority of the proposed development is situated on existing hardstand and disturbed vegetation, minimising impacts to important habitats.
E3	Threatened species, populations, ecological communities listed under State or Commonwealth legislation, or High Conservation Habitat	Yes	The Subject Land is identified as potential habitat for threatened species.	The proposed development has been designed to protect threatened species and vegetation communities. The proposal has been carefully located in areas with low biodiversity value by prioritising development on previously disturbed land, including existing hardstand surfaces, built structures, and managed garden beds. This approach minimises impacting significant threatened species habitat. No threatened ecological communities will be impacted by the proposed development.
E4	Wildlife Corridor	Yes	The west portion of the Subject Property is mapped as a 'Wildlife Corridor' on the Warringah DCP Wildlife Corridors Map.	The development proposes to remove 0.42 ha of native vegetation considered to form part of a Wildlife Corridor. The Subject Land is positioned to minimise clearing of the mature native vegetation in the west portion of the Subject Property. Sufficient connectivity to the Wildlife Corridor will remain after the proposed clearing of the vegetation.
E5	Native Vegetation	Yes	The west portion of the Subject Property is mapped as 'Native Vegetation' on the Warringah DCP Native Vegetation Map.	The development proposes to remove 0.42 ha of native vegetation considered as a Native Vegetation. The Subject Land is positioned to minimise clearing of the mature native community in the west portion of the Subject Property. Sufficient amounts of native vegetation will remain after the proposed clearing of the vegetation.
E6	Retaining Unique Environmental Features	Yes	The Subject Property is located within the Warringah sector of the Northern Beaches Council.	The development is designed to prioritise the retention of mature native trees along the western boundary of the Subject Property. This bushland contributes to a habitat corridor likely to be utilised by fauna species. Further to this, rock outcrops within this area will be retained to minimise impacts to fauna habitat.
E7	Development on land adjoining public open space	Yes	The Subject Property is mapped on the 'Land Adjoining Public Open Space' Warringah DCP Map.	The proposed development is located in an already established industrial area. The proposed changes to the Subject Property are unlikely to decrease the public access/enjoyment of the adjoining Public Open Space. Access to the Public Open Space will continue to occur in the locality.

Control Number	Control Name	Does this control apply?	Reason	Suitable Action Proposed
E8	Waterways and Riparian Lands	No	The Subject Property is not mapped on the 'Waterways and Riparian Lands' Warringah DCP Map.	No action required.
E9	Coastal Hazard	No	The Subject Property is not mapped on the Warringah LEP Coastline Hazard Map.	No action required.

12.3 Commonwealth Environment Protection and Biodiversity Conservation Act 1999

Commonwealth listed threatened species that are MNES have potential to occur in the Subject Land on occasion.

Grey-headed Flying-foxes (Pteropus poliocephalus) which are listed as 'vulnerable' under the EPBC Act were observed flying over the Subject Property. This species was not observed landing or roosting within the Subject Land and no breeding camps were found within the Subject Property.

Several White-throated Needletail (Hirundapus caudacutus) which are listed as 'vulnerable' under the EPBC Act were observed flying over the Subject Property. These species may forage over the Subject Land on occasion, though are unlikely to rely heavily upon the vegetation within the Subject Land owing to its disturbed urban locality. These species will continue to utilise habitat the Subject Land in the same manner post-development.

Extensive targeted survey effort did not reveal any other Matters of National Environmental Significance within the Subject Property.

No Matters of National Environmental Significance are likely to be significantly impacted by the proposed development. No referral to the Commonwealth is recommended for the proposed development..

12.4 State Environmental Planning Policy (Biodiversity and Conservation) 2021

12.4.1 Chapter 2: Vegetation in Non-Rural Areas

All clearing of vegetation (native and non-native) including dying or dead vegetation that is required as habitat of native animals (ie. Hollow-bearing stags) requires a permit granted by the consent authority.

12.4.2 Chapter 4: Koala Habitat Protection

The Subject Land is located within a Local Government Area listed in Schedule 1 of the Chapter 4: Koala Habitat Protection. At least six species of 'Koala Use Tree Species' (OEH 2018) were identified within and surrounding the Subject Land with documented koala use in the Central Coast Koala Management Area. A review of NSW Wildlife Atlas data (BioNet) (NSW DCCEEW 2025b) revealed 14 koala records in the 10km locality, as recent as 2022. The nearest record is from 2019 approximately 1km south-west of the Subject Property. The Subject Land is not considered to be 'core koala habitat' as it is does not contain highly suitable koala habitat or have koalas recorded present within the Subject Property.

Table 43. Koala use tree species within the Subject Land

Species	Documented Koala Use in the Central Coast Koala Management Area
Allocasuarina littoralis	Low use
Allocasuarina torulosa	Low use
Angophora costata	Low use
Casuarina glauca	Low use

Corymbia gummifera	Significant use
Eucalyptus umbra	Irregular use

12.5 State Environmental Planning Policy (Resilience and Hazards) 2021

The State Environmental Planning Policy (Resilience and Hazards) 2021 applies to land within the 'Coastal Environment Area' and aims to promote an integrated and co-ordinated approach to land use planning in the coastal zone in a manner consistent with the objectives of the *Coastal Management Act 2016*.

The Subject land is not located within the mapped 'Coastal Environment Area' or the mapped 'Coastal Use Area' therefore the SSD does not need to address the provisions of this SEPP.

The Subject Land is not located within any mapped 'Littoral Rainforest', 'Coastal Wetlands' or mapped areas in proximity to such, therefore the SSD does not need to address the provisions of this SEPP.

12.6 Fisheries Management Act 1994

The Subject Land contains no mapped 'Key Fish Habitat' (KFH). The closest mapped KFH occurs approximately 200 km north-east of the Subject Land. There is no proximal mapped habitat for threatened fish species. The proposed development is not an activity requiring a permit under the *Fisheries Management Act 1994*.

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14. Appendices

Appendix A. Fauna recorded in Subject Land by Land Eco Consulting

Appendix B. BAM VIS Field Survey Forms (copied from electronic data sheet)

Appendix C. Biodiversity Credit Reports from Biodiversity Assessment Method Calculator

Appendix D. Microbat Call Analysis Report (Lachlan McRae Fauna Services 2025)

Appendix A. Fauna opportunistically recorded in Subject Land by Land Eco Consulting

Class	Scientific Name	Common Name	NSW Biodiversity Conservation Act 2016 Status
Amphibia	*Crinia signifera*	Common Eastern Froglet	Protected
Aves	*Anthochaear chrysoptera*	Little Wattlebird	Protected
Aves	*Acanthorhynchus tenuirostris*	Eastern Spinebill	Protected
Aves	*Acridotheres tristis*	Common Myna	Introduced
Aves	*Alectura lathami*	Australian Brushturkey	Protected
Aves	*Cacatua galerita*	Sulphur-crested Cockatoo	Protected
Aves	*Cacatua sanguinea*	Little Corella	Protected
Aves	*Coracina novaehollandiae*	Black-faced Cuckoo-shrike	Protected
Aves	*Corvus coronoides*	Australian Raven	Protected
Aves	*Cracticus torquatus*	Grey Butcherbird	Protected
Aves	*Cracticus tibicen*	Grey Butcherbird	Protected
Aves	*Eopsaltria australis*	Eastern Yellow Robin	Protected
Aves	*Hirundapus caudacutus*	White-throated Needletail	Vulnerable
Aves	*Hirunda neoxena*	Welcome Swallow	Protected
Aves	*Malurus lamberti*	Variegated Fairywren	Protected
Aves	*Manorina melanocephala*	Noisy Miner	Protected; Key Threatening Process
Aves	*Trichoglossus haematodus*	Rainbow Lorikeet	Protected
Aves	*Scythrops novaehollandiae*	Channel-billed Cuckoo	Protected
Aves	*Strepera graculina*	Pied Currawong	Protected
Mammalia	*Chalinolobus gouldii*	Gould's Wattled Bat	Protected
Mammalia	*Vespadelus darlingtoni or Miniopterus orianae oceanensis*	Large Forest Bat or Large Bent-winged Bat	Protected or Vulnerable
Mammalia	*Pteropus poliocephalus*	Grey-headed Flying-fox	Vulnerable
Mammalia	*Rattus rattus*	Black Rat	Introduced
Mammalia	*Tachyglossus aculeatus*	Short-beaked Echidna	Protected
Mammalia	*Vulpes vulpes*	Red Fox	Introduced; Key Threatening Process
Mammalia	*Wallabia bicolor*	Swamp Wallaby	Protected
Reptilia	*Eulamprus quoyii*	Eastern Water Skink	Protected
Reptilia	*Lampropholis guichenoti*	Pale-flecked Garden Sunskink	Protected
Reptilia	*Intellagamma lesueurii*	Eastern Water Dragon	Protected
Reptilia	*Sapriscinus mustellinus*	Weasel Shadeskink	Protected

Appendix B. BAM VIS Field Survey Forms (copied from electronic data sheet)

BAM Site - Field Survey Form

Date:	23/7/25	**Plot ID:**	1	**Photo #:**	Plate 2
Zone:	56	**Plot Dimensions:**	Irregular	**Easting:**	338864
Datum:	GDA2020	**Middle Bearing (o) at 0m:**	150	**Northing:**	6262510
PCT:	3592	**Condition Class**	Mature	**Ecologists:**	Semonn Oleksyn and Rebecca Asquith

Counts apply when the **number of tree stems** within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30…, 100, 200, 300…). For a **multi-stemmed tree,** only the largest living stem is included in the count/estimate. **Tree stems must be living.**

Growth Form	Scientific Name	Cover	Abundance
Tree (TG)	*Angophora costata*	9	N/A
Tree (TG)	*Allocasuarina torulosa*	12	N/A
Shrub (SG)	*Elaeocarpus reticulatus*	5	15
Shrub (SG)	*Dodonaea triquetra*	2	20
Fern (EG)	*Pteridium esculentum*	3	30
Grass & grasslike (GG)	*Caustis flexuosa*	0.1	5
Shrub (SG)	*Acacia linifolia*	6	N/A
Grass & grasslike (GG)	*Lomandra longifolia*	4	30
Shrub (SG)	*Platysace linearifolia*	0.2	40
Grass & grasslike (GG)	*Entolasia stricta*	0.1	5
Grass & grasslike (GG)	*Lepidosperma laterale*	1.5	30
Shrub (SG)	*Podocarpus spinulosus*	5	50
Grass & grasslike (GG)	*Lomandra filiformis*	0.1	2
Other (OG)	*Smilax glyciphylla*	0.2	30
Shrub (SG)	*Hakea sericea*	0.5	10
Grass & grasslike (GG)	*Entolasia marginata*	0.1	1
Grass & grasslike (GG)	*Lomandra obliqua*	0.1	3
Shrub (SG)	*Acacia ulicifolia*	0.2	3
Shrub (SG)	*Leucopogon ericoides*	0.1	2
Shrub (SG)	*Acacia suaveolens*	0.5	20
Shrub (SG)	*Crowea saligna*	1	50

DBH	# Tree Stems Count
80+cm	0
50-79cm	5
30-49cm	9
20-29cm	6
10-19cm	5
5-9cm	24
<5cm	39

Number of Hollow-bearing Trees
0

For **hollows,** count only the presence of a stem containing hollows. For a **multi-stemmed tree,** only the largest stem is included in the count/estimate. **Stems may be dead and may be shrubs.**

Length of Logs (m)	55

(≥10 cm diameter, >50 cm in length)

BAM Attribute (1 x 1m plots)	Litter Cover (%)
1	90
2	60
3	85
4	85
5	95
Average (#no./5)	**83**

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Forb (FG)	*Dianella caerulea*	0.1	5
Shrub (SG)	*Leptospermum polygalifolium*	0.2	5
Shrub (SG)	*Banksia spinulosa*	0.3	2
Shrub (SG)	*Ricinocarpos pinifolius*	0.1	1
Shrub (SG)	*Callistemon linearis*	0.2	3
Shrub (SG)	*Persoonia linearis*	2	20
Shrub (SG)	*Epacris longiflora*	0.1	1
Forb (FG)	*Xanthosia pilosa*	0.1	5
Shrub (SG)	*Acacia longissima*	0.1	2
Tree (TG)	*Ceratopetalum gummiferum*	4	10
Shrub (SG)	*Platylobium formosum*	0.1	1
Other (OG)	*Calochlaena dubia*	0.1	3
Shrub (SG)	*Dillwynia retorta*	0.2	15
Shrub (SG)	*Pimelea linifolia*	0.1	1
Shrub (SG)	*Banksia ericifolia*	0.3	2
Shrub (SG)	*Kunzea ambigua*	0.5	4
Other (OG)	*Cassytha pubescens*	0.1	5
Shrub (SG)	*Acacia longifolia*	0.5	1
Tree (TG)	*Eucalyptus umbra*	3	1
Forb (FG)	*Gonocarpus teucrioides*	0.1	2
Shrub (SG)	*Boronia pinnata*	0.1	1
Other (OG)	*Xanthorrhoea arborea*	2	2
Other (OG)	*Billardiera scandens*	0.1	1
Shrub (SG)	*Boronia floribunda*	0.1	1
Shrub (SG)	*Acacia terminalis*	0.1	1
Shrub (SG)	*Grevillea buxifolia*	0.1	1
Grass & grasslike (GG)	*Schoenus apogon*	0.1	1
Shrub (SG)	*Hibbertia linearis*	0.1	1
Forb (FG)	*Actinotus helianthi*	0.1	2
HTW	*Lantana camara*	0.1	1

Growth Form	Composition Data	Structure Data
Tree	**4**	**28**
Shrub	**28**	**25.7**
Grass	**8**	**6.1**
Forb	**4**	**0.4**
Fern	**1**	**3**
Other	**5**	**2.5**
H.T.W	**1**	**0.1**

Cover: 0.1, 0.2, 0.3, …, 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m

Abundance: 1, 2, 3, …, 10, 20, 30, … 100, 200, …, 1000, …

BAM Site - Field Survey Form

Date:	23/7/25	**Plot ID:**	2	**Photo #:**	**Plate 3**
Zone:	56	**Plot Dimensions:**	Irregular	**Easting:**	338859
Datum:	GDA2020	**Middle Bearing (o) at 0m:**	100	**Northing:**	6262545
PCT:	3592	**Condition Class**	Sparse Regenerating Understorey	**Ecologists:**	Semonn Oleksyn and Rebecca Asquith

Counts apply when the **number of tree stems** within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30…, 100, 200, 300…). For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate. **Tree stems must be living.**

Growth Form	Scientific Name	Cover	Abundance
Planted	*Banksia integrifolia*	1	2
Planted	*Casuarina glauca*	75	N/A
Planted	*Lomandra longifolia*	0.3	10
HTE	*Ochna serrulata*	0.1	10
Tree (TG)	*Cupaniopsis anacardioides*	0.1	1
Shrub (SG)	*Elaeocarpus reticulatus*	0.1	1
Non-native	*Sonchus oleraceus*	0.1	10
Shrub (SG)	*Pittosporum undulatum*	0.1	5
HTE	*Cinnamomum camphora*	0.2	1
HTE	*Asparagus aethiopicus*	0.1	5
Planted	*Nandina domestica*	0.1	1
HTE	*Ehrharta erecta*	0.1	15
Planted	*Dietes grandiflora*	30	N/A
Non-native	*Setaria pumila*	0.1	1
Shrub (SG)	*Homalanthus populifolius*	0.1	1
HTE	*Lantana camara*	0.1	1
Non-native	*Sida rhombifolia*	0.1	1
HTE	*Solanum seaforthianum*	0.5	20
Non-native	*Fumaria capreolata*	0.1	3
Non-native	*Solanum nigrum*	0.1	1
Tree (TG)	*Melia azedarach*	0.2	2

DBH	# Tree Stems Count
80+cm	0
50-79cm	0
30-49cm	0
20-29cm	0
10-19cm	0
5-9cm	0
<5cm	3

Number of Hollow-bearing Trees
0

For **hollows**, count only the presence of a stem containing hollows. For a **multi-stemmed tree**, only the largest stem is included in the count/estimate. **Stems may be dead and may be shrubs.**

Length of Logs (m)	0

(≥10 cm diameter, >50 cm in length)

BAM Attribute (1 x 1m plots)	Litter Cover (%)
1	95
2	85
3	99
4	80
5	98
Average (#no./5)	**91.4**

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

				Growth Form	Composition Data	Structure Data
				Tree	2	0.3
				Shrub	3	0.3
				Grass	0	0
				Forb	0	0
				Fern	0	0
				Other	0	0
				H.T.E	6	1.1
				Cover: 0.1, 0.2, 0.3, …, 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m		
				Abundance: 1, 2, 3, …, 10, 20, 30, … 100, 200, …, 1000, …		

Appendix C. Biodiversity Credit Reports from Biodiversity Assessment Method Calculator

BAM Credit Summary Report

Proposal Details

Assessment Id 00045769/BAAS18059/25/00059485	Proposal Name Brookvale 120 Old Pittwater Road	BAM data last updated * 05/08/2025
Assessor Name Kurtis Lindsay	Report Created 04/11/2025	BAM Data version * Current classification (live - default) (82)
Assessor Number BAAS18059	BAM Case Status Finalised	Date Finalised 04/11/2025
Assessment Revision 0	BOS entry trigger BOS Threshold: Area clearing threshold	Assessment Type Part 4 Developments (Small Area)

* 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 Coastal Enriched Sandstone Forest												
1	3592_Mature	Not a TEC	70.5	68.0	0.42	PCT Cleared - 61%	High Sensitivity to Gain			1.75		12

2	3592_SparseRegen	Not a TEC	4.7	4.7	0.09	PCT Cleared - 61%	High Sensitivity to Gain			1.75		0
											Subtotal	**12**
											Total	**12**

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

BAM Candidate Species Report

Proposal Details

Assessment Id 00045769/BAAS18059/25/00059485	Proposal Name Brookvale 120 Old Pittwater Road	BAM data last updated * 05/08/2025
Assessor Name Kurtis Lindsay	Report Created 04/11/2025	BAM Data version * Current classification (live - default) (82)
Assessor Number BAAS18059	Assessment Type Part 4 Developments (Small Area)	BAM Case Status Finalised
Assessment Revision 0	BOS entry trigger BOS Threshold: Area clearing threshold	Date Finalised 04/11/2025

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

List of Species Requiring Survey

Name	Presence	Survey 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?

Genoplesium baueri Bauer's Midge Orchid	No (surveyed)	☐ Jan ☑ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Hibbertia spanantha Julian's Hibbertia	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Hoplocephalus bungaroides Broad-headed Snake	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?
Melaleuca deanei Deane's Paperbark	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Persoonia hirsuta Hairy Geebung	No (surveyed)	☐ 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?
Tyto tenebricosa Sooty Owl	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☑ May ☑ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Vespadelus troughtoni Eastern Cave Bat	No (surveyed)	☑ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Threatened species Manually Added

Common Name	Scientific Name
Loggerhead Turtle	Caretta caretta
Leatherback Turtle	Dermochelys coriacea
Beach Stone-curlew	Esacus magnirostris
Curlew Sandpiper	Calidris ferruginea
Sooty Owl	Tyto tenebricosa
Regent Honeyeater	Anthochaera phrygia
Eastern Cave Bat	Vespadelus troughtoni
Hygrocybe reesiae	Hygrocybe reesiae

Threatened species assessed as not on site

Refer to BAR for detailed justification

BAM Candidate Species Report

Common name	Scientific name	Justification in the BAM-C
Beach Stone-curlew	Esacus magnirostris	Refer to BAR
Curlew Sandpiper	Calidris ferruginea	Habitat constraints
Haloragodendron lucasii	Haloragodendron lucasii	Habitat constraints Geographic limitations
Large Bent-winged Bat	Miniopterus orianae oceanensis	Habitat constraints
Leatherback Turtle	Dermochelys coriacea	Habitat constraints
Little Bent-winged Bat	Miniopterus australis	Habitat constraints
Loggerhead Turtle	Caretta caretta	Habitat constraints
Regent Honeyeater	Anthochaera phrygia	Habitat constraints
Swift Parrot	Lathamus discolor	Habitat constraints

BAM Predicted Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00045769/BAAS18059/25/00059485	Brookvale 120 Old Pittwater Road	05/08/2025
Assessor Name	Report Created	BAM Data version *
Kurtis Lindsay	04/11/2025	Current classification (live - default) (82)
Assessor Number	Assessment Type	BAM Case Status
BAAS18059	Part 4 Developments (Small Area)	Finalised
Assessment Revision	BOS entry trigger	Date Finalised
0	BOS Threshold: Area clearing threshold	04/11/2025

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

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)
Beach Stone-curlew	Esacus magnirostris	3592-Sydney Coastal Enriched Sandstone Forest
Black Bittern	Ixobrychus flavicollis	3592-Sydney Coastal Enriched Sandstone Forest
Black-chinned Honeyeater (eastern subspecies)	Melithreptus gularis gularis	3592-Sydney Coastal Enriched Sandstone Forest
Broad-headed Snake	Hoplocephalus bungaroides	3592-Sydney Coastal Enriched Sandstone Forest
Brown Treecreeper (eastern subspecies)	Climacteris picumnus victoriae	3592-Sydney Coastal Enriched Sandstone Forest
Curlew Sandpiper	Calidris ferruginea	3592-Sydney Coastal Enriched Sandstone Forest
Dusky Woodswallow	Artamus cyanopterus cyanopterus	3592-Sydney Coastal Enriched Sandstone Forest
Eastern Coastal Free-tailed Bat	Micronomus norfolkensis	3592-Sydney Coastal Enriched Sandstone Forest
Eastern Curlew	Numenius madagascariensis	3592-Sydney Coastal Enriched Sandstone Forest

Eastern False Pipistrelle	Falsistrellus tasmaniensis	3592-Sydney Coastal Enriched Sandstone Forest
Eastern Osprey	Pandion cristatus	3592-Sydney Coastal Enriched Sandstone Forest
Flame Robin	Petroica phoenicea	3592-Sydney Coastal Enriched Sandstone Forest
Gang-gang Cockatoo	Callocephalon fimbriatum	3592-Sydney Coastal Enriched Sandstone Forest
Golden-tipped Bat	Phoniscus papuensis	3592-Sydney Coastal Enriched Sandstone Forest
Great Knot	Calidris tenuirostris	3592-Sydney Coastal Enriched Sandstone Forest
Greater Broad-nosed Bat	Scoteanax rueppellii	3592-Sydney Coastal Enriched Sandstone Forest
Grey-headed Flying-fox	Pteropus poliocephalus	3592-Sydney Coastal Enriched Sandstone Forest
Large Bent-winged Bat	Miniopterus orianae oceanensis	3592-Sydney Coastal Enriched Sandstone Forest
Lesser Sand-plover	Charadrius mongolus	3592-Sydney Coastal Enriched Sandstone Forest
Little Bent-winged Bat	Miniopterus australis	3592-Sydney Coastal Enriched Sandstone Forest
Little Eagle	Hieraaetus morphnoides	3592-Sydney Coastal Enriched Sandstone Forest
Little Lorikeet	Glossopsitta pusilla	3592-Sydney Coastal Enriched Sandstone Forest
Little Tern	Sternula albifrons	3592-Sydney Coastal Enriched Sandstone Forest
Red Knot	Calidris canutus	3592-Sydney Coastal Enriched Sandstone Forest
Regent Honeyeater	Anthochaera phrygia	3592-Sydney Coastal Enriched Sandstone Forest
Rosenberg's Goanna	Varanus rosenbergi	3592-Sydney Coastal Enriched Sandstone Forest
Sanderling	Calidris alba	3592-Sydney Coastal Enriched Sandstone Forest
Scarlet Robin	Petroica boodang	3592-Sydney Coastal Enriched Sandstone Forest
South-eastern Glossy Black-Cockatoo	Calyptorhynchus lathami lathami	3592-Sydney Coastal Enriched Sandstone Forest
Spotted-tailed Quoll	Dasyurus maculatus	3592-Sydney Coastal Enriched Sandstone Forest
Square-tailed Kite	Lophoictinia isura	3592-Sydney Coastal Enriched Sandstone Forest
Superb Fruit-Dove	Ptilinopus superbus	3592-Sydney Coastal Enriched Sandstone Forest
Swift Parrot	Lathamus discolor	3592-Sydney Coastal Enriched Sandstone Forest
Turquoise Parrot	Neophema pulchella	3592-Sydney Coastal Enriched Sandstone Forest
Varied Sittella	Daphoenositta chrysoptera	3592-Sydney Coastal Enriched Sandstone Forest

White-bellied Sea-Eagle	Haliaeetus leucogaster	3592-Sydney Coastal Enriched Sandstone Forest
White-throated Needletail	Hirundapus caudacutus	3592-Sydney Coastal Enriched Sandstone Forest
Yellow-bellied Sheathtail-bat	Saccolaimus flaviventris	3592-Sydney Coastal Enriched Sandstone Forest

Threatened species Manually Added

Common Name	Scientific Name
Regent Honeyeater	Anthochaera phrygia
Sanderling	Calidris alba
Red Knot	Calidris canutus
Curlew Sandpiper	Calidris ferruginea
Great Knot	Calidris tenuirostris
Lesser Sand-plover	Charadrius mongolus
Beach Stone-curlew	Esacus magnirostris
Eastern Curlew	Numenius madagascariensis
Superb Fruit-Dove	Ptilinopus superbus
Little Tern	Sternula albifrons

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 Vegetation Zones Report

Proposal Details

Assessment Id
00045769/BAAS18059/25/00059485

Assessment name
Brookvale 120 Old Pittwater Road

BAM data last updated *
05/08/2025

Assessor Name
Kurtis Lindsay

Report Created
04/11/2025

BAM Data version *
Current classification (live - default) (82)

Assessor Number
BAAS18059

Assessment Type
Part 4 Developments (Small Area)

BAM Case Status
Finalised

Assessment Revision
0

BOS entry trigger
BOS Threshold: Area clearing threshold

Date Finalised
04/11/2025

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Vegetation Zones

#	Name	PCT	Condition	Area	Minimum number of plots	Management zones
1	3592_Mature	3592-Sydney Coastal Enriched Sandstone Forest	Mature	0.42	1	Complete (0.39 ha) Understory (0.01 ha) Canopy (0.02 ha)

2	3592_SparseRegen	3592-Sydney Coastal Enriched Sandstone Forest	SparseRegen	0.09	1	

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id
00045769/BAAS18059/25/00059485

Proposal Name
Brookvale 120 Old Pittwater Road

BAM data last updated *
05/08/2025

Assessor Name
Kurtis Lindsay

Assessor Number
BAAS18059

BAM Data version *
Current classification (live - default) (82)

Proponent Names

Report Created
04/11/2025

BAM Case Status
Finalised

Assessment Revision
0

BOS entry trigger
BOS Threshold: Area clearing threshold

Assessment Type
Part 4 Developments (Small Area)

Date Finalised
04/11/2025

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Potential Serious and Irreversible Impacts

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

Species
Nil

Additional Information for Approval

BAM Biodiversity Credit Report (Like for like)

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
No Changes

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

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
3592-Sydney Coastal Enriched Sandstone Forest	Not a TEC	0.5	0	12	12

BAM Biodiversity Credit Report (Like for like)

3592-Sydney Coastal Enriched Sandstone Forest

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Sydney Coastal Dry Sclerophyll Forests This includes PCT's: 3583, 3592, 3594	Sydney Coastal Dry Sclerophyll Forests >=50% and <70%	3592_Mature	No	12	Pittwater, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Sydney Coastal Dry Sclerophyll Forests This includes PCT's: 3583, 3592, 3594	Sydney Coastal Dry Sclerophyll Forests >=50% and <70%	3592_SparseRegen	No	0	Pittwater, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

No Species Credit Data

Credit Retirement Options

Like-for-like credit retirement options

Appendix D. Microbat Call Analysis Report (Lachlan McRae Fauna Services 2025)

Lachlan McRae Fauna Services
ABN: 96 905 438 927
Lmcrae.ecology@gmail.com

MICROBAT CALL ANALYSIS REPORT

05 March 2025

Job #: 027
Project name: Brookvale Microbat Call Analysis
Client: Eco Land Consulting
Project Location: -33.764670,151.261040 (Brookvale, NSW).

Table 1 – Summary of the microbat species recorded from four Anabat Choruses deployed at Brookvale, NSW from 24-28/01/2025. Ordered from highest to lowest ID confidence.

Common Name	Scientific Name	Calling Activity (see section 2.5)	ID Confidence (see section 2.4)	Recorder # (see section 2.1)
Gould's Wattled Bat	*Chalinolobus gouldii*	Low	Certain	1,2,3 & 4
Large Forest Bat or Large Bent-winged Bat	*Vespadelus darlingtoni* or *Miniopterus orianae oceanensis*	Low	Species Group	4

1. Introduction

1.1 Background/Disclaimer

The author of this report, Lachlan McRae, has been engaged to undertake microbat echolocation call analysis for Eco Land Consulting. The analysis will determine the presence/absence of microbat species within the supplied audio data set.

The data necessary for this analysis was provided to the author via an online download link. The author was not involved in the data collection. As such, the author makes no claim that the data was collected appropriately.

Microbat call identification works on a probabilistic scale due to the wide variety of overlapping call types most species can make, and it can therefore be almost impossible to be 100% certain of a call identification for many species. As such, the author is only presenting their professional opinion (see section 5.1 for analyst experience and qualifications).

2. Methods

2.1 Supplied Data

The author/analyst was supplied with 17 nights of ultrasonic audio data (12,677 zero crossing files) from four ultrasonic recording devices, three deployed from 24-28/01/2025 and one deployed from 23-28/01/2025. Only four nights per recorder was required for analysis so only nights from 24-28/01/2025 were analysed on all four recorders, since the night of 23/01/2025 had the lowest calling activity on the single recorder that was deployed for five nights.

The recorders were Anabat Expresses named “AB1”, “AB2”, “AB3” and “AB4”.

AB1 was deployed at -33.765670, 151.260070 and will be referred to recorder 1 throughout this report.
AB2 was deployed at -33.765900, 151.260780 and will be referred to recorder 2 throughout this report.
AB3 was deployed at -33.764670, 151.261040 and will be referred to recorder 3 throughout this report.
AB4 was deployed at -33.765470, 151.259710 and will be referred to recorder 4 throughout this report.

The recorder deployment info supplied by Eco Land Consulting for each recorder is located below in Table 2.

Table 2 – Combined recorder deployment information supplied by Eco Land Consulting for all recorders.

Recorder Deployment Category	Answer (you can tick more than 1)
Broad habitat type	- Dry sclerophyll ☑ - Wet sclerophyll ☐ - Rainforest ☐ - Coastal scrub ☐ - Wetland ☐ - Open grassland ☐ - Desert ☐ - Street trees ☐ - Garden ☑
Urbanisation level	- City/urban ☐ - Suburban ☑ - Rural/farmland ☐ - Small or moderate bush-block surrounded by urbanisation ☐ - Natural habitat for >1km in all directions ☐ 
Proximity to a waterbody that is >3m wide/diameter	- Directly overlooking water ☐ - Within 200m of water ☐ - >200m from water ☑
Proximity to a moderate or large sized rocky outcrop/escarpment	- Amongst/overlooking rocky habitat ☑ - Within 2km of rocky habitat ☐ - Further than 2km from rocky habitat ☐
Proximity to an artificial structure such as mine tunnel, shed, building, culvert etc.	Proximity to building, culverts, underground car parks. However no substantially suitable roosting habitat was observed on the proximal artificial structures.
Proximity to solid objects	- Amongst forest/woodland with minimal open spaces ☑ - Edge of forest/woodland with some open spaces ☐ - Open area with scattered or no trees ☐

2.2 Analysis software & Filtering process

Microbat calls were analysed using Titley Scientific's Anabat Insight (version 2.1.3.0) on MacOS Sequoia (version 15.1.1).

A custom bat call filter was applied to the 12,677 files, leaving 358 files that potentially contain a bat call sequence with >4 pulses. An Anabat Insight decision tree was then applied to the 358 files, which labelled 28 files with a species or species group ready for manual verification. The remaining 330 files were assumed to contain either non-identifiable bat calls (e.g., close-range/high-clutter or poor-quality pulses) or non-bat calls (e.g., wind, insects, other random noise etc.).

2.3 Candidate microbat species

A list of microbat species with potential to occur at the data collection points, based solely on geographic distribution range, was generated using BatMap (Australasian Bat Society, 2025). A radius of 10km from the data collection point was used (Fig. 1)

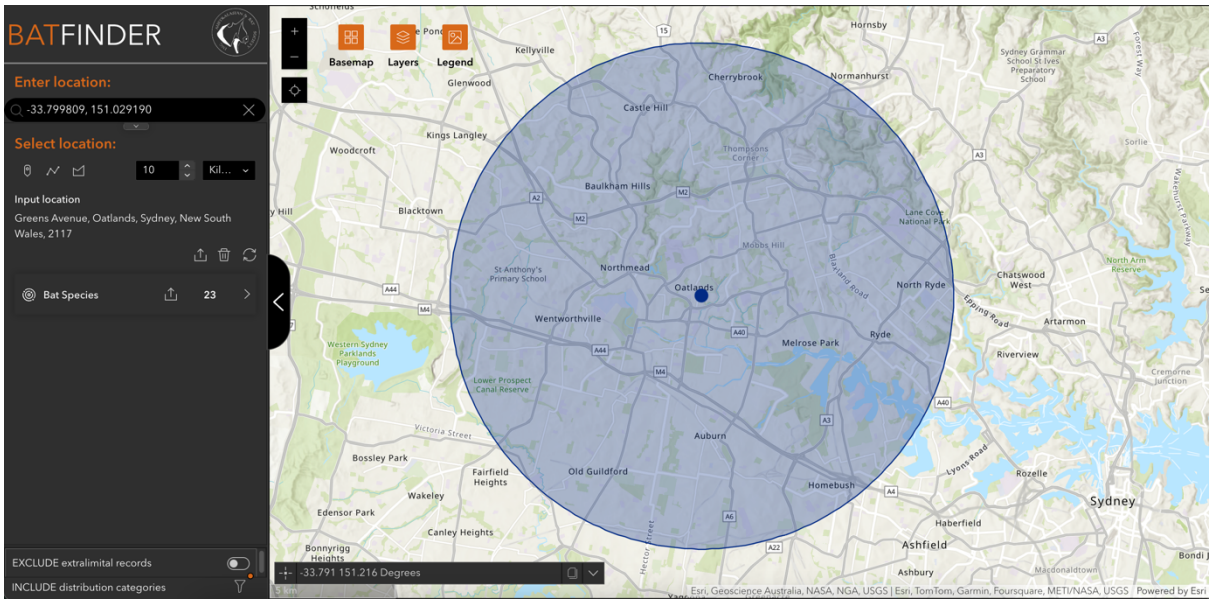

Figure 1 – 10km search distance used to generate a microbat species list with BatMap. Search distance centred on the data collection point in Brookvale, NSW.

A total of 20 possible microbat species were generated from BatMap (Table 3).

Table 3 – The list of candidate microbat species produced by BatMap's search tool, with a 10km radius search distance from the data collection point in Brookvale, NSW. Species ordered from lowest to highest call frequency (Fc).

Common Name	Scientific Name
White-striped Freetail Bat	*Austronomus australis*
Yellow-bellied Sheathtail Bat	*Saccolaimus flaviventis*
Large-eared Pied Bat	*Chalinolobus dwyeri*
Gould's Wattled Bat	*Chalinolobus gouldii*
Ride's Free-tailed Bat	*Ozimops ridei*
Eastern Coastal Freetail Bat	*Micronomus norfolkensis*
Greater Broad-nosed Bat	*Scoteanax rueppellii*

Eastern Broad-nosed Bat	*Scotorepens orion*
Eastern False Pipistrelle	*Falsistrellus tasmaniensis*
Southern Myotis	*Myotis macropus*
Lesser Long-eared Bat	*Nyctophilus geoffroyi*
Gould's Long-eared Bat	*Nyctophilus gouldi*
Large Forest Bat	*Vespadelus darlingtoni*
Large Bent-winged Bat	*Miniopterus orianae oceanensis*
Chocolate Wattled Bat	*Chalinolobus morio*
Little Forest Bat	*Vespadelus vulturnus*
Eastern Forest Bat	*Vespadelus pumilus*
Little Bent-winged Bat	*Miniopterus australis*
Eastern Horseshoe Bat	*Rhinolophus megaphyllus*
Golden-tipped Bat	*Phoniscus papuensis*

2.4 Call Identification

Calls were identified to one or more of the 20 species listed above (Table 3) based on 1) hundreds of reference calls personally collected by Lachlan McRae within NSW, 2) *Bat Calls of NSW* by Pennay *et al.* (2004), 3) *Bat Calls of Central Eastern NSW* by Chris Corben (2009), 4) call metrics and ID features obtained from discussions with recognised bat experts including Michael Pennay, Brad Law, Greg Ford and Chris Corben, 5) the deployment information outlined in Section 2.1 (Table 2), and 6) the author's understanding of each species' foraging behaviour and habitat requirements (Churchill 2008, Baker & Gynther 2023).

Each call was assigned to one of the following identification confidence categories:

1) **Certain** — no doubt about the identification of the species. This rating is typically reserved for species that do not overlap in characteristic frequency and/or call shape with any other species.
2) **Almost Certain** — almost no chance of confusion with another species. This rating is typically given instead of "Certain" if there are other species that can produce similar calls on rare occasions.
3) **Probable** —moderate chance of confusion with another species but it is most likely the chosen species.
4) **Species Group** — call could more or less equally belong to one of two or more species.

2.5 Call Activity

Calling activity (i.e., the number of bat calls) for each species was estimated using the following categories:

1) **Low** — Less than an average of 10 calls per night.
2) **Moderate** — An average of 10-50 calls per night.
3) **High** — More than an average of 50 calls per night.

3. Results

3.1 Species identified

A total of 28 audio files (see Section 2.2) from four Anabat Chorus were manually verified to determine the presence/absence of microbat species on each recorder. A total of one species and one species group were identified in the Brookvale data set (Table 4–7 & Fig. 2–3).

Table 4 – Results from recorder AB1 deployed at Brookvale, NSW. Ordered from highest to lowest ID confidence.

Common Name	Scientific Name	Calling Activity (Section 2.5)	ID Confidence (Section 2.4)
Gould's Wattled Bat	*Chalinolobus gouldii*	Low	Certain

Table 5 – Results from recorder AB2 deployed at Brookvale, NSW. Ordered from highest to lowest ID confidence.

Common Name	Scientific Name	Calling Activity (Section 2.5)	ID Confidence (Section 2.4)
Gould's Wattled Bat	*Chalinolobus gouldii*	Low	Almost Certain

Table 6 – Results from recorder AB3 deployed at Brookvale, NSW. Ordered from highest to lowest ID confidence.

Common Name	Scientific Name	Calling Activity (Section 2.5)	ID Confidence (Section 2.4)
Gould's Wattled Bat	*Chalinolobus gouldii*	Low	Probable

Table 7 – Results from recorder AB4 deployed at Brookvale, NSW. Ordered from highest to lowest ID confidence.

Common Name	Scientific Name	Calling Activity (Section 2.5)	ID Confidence (Section 2.4)
Gould's Wattled Bat	*Chalinolobus gouldii*	Low	Certain
Large Forest Bat or Large Bent-winged Bat	*Vespadelus darlingtoni* or *Miniopterus orianae oceanensis*	Low	Species Group

3.2 Supporting call ID evidence

An example call from each recorded species/species group is shown below in compressed mode. Calls are typically displayed in 'compressed mode' at a time scale of "F7-10ms" or "F6-25ms", depending on what display best highlights the most conclusive ID feature. Species are ordered from lowest to highest calling characteristic frequency (Fc).

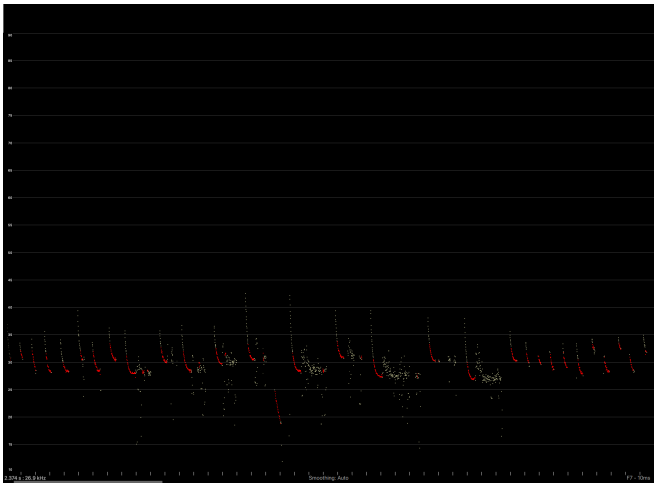

Figure 2 – Chalinolobus gouldii.

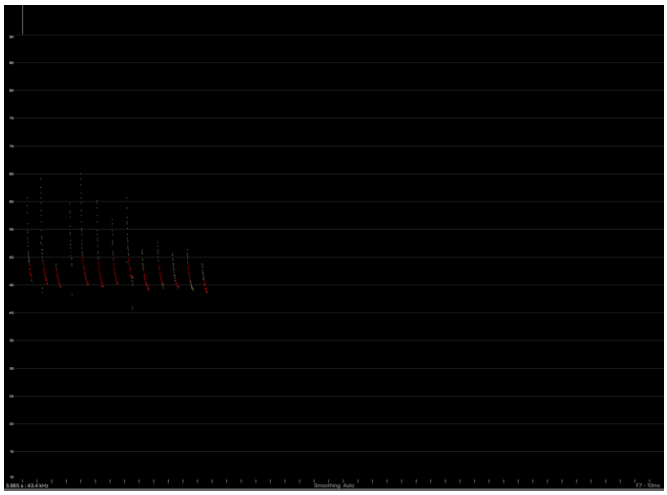

Figure 3 – Vespadelus darlingtoni or Miniopterus orianae oceanensis.

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5. Appendix

5.1 Analyst experience

The author and analyst, Lachlan McRae, has collected hundreds of microbat reference calls throughout NSW. Hundreds of hours have been spent processing and extracting call metrics from those reference calls to determine identification features for each species. These reference calls now form part of his personal NSW reference call library, which is used to significantly increase the accuracy of microbat call analysis within NSW and beyond. Relevant qualifications/completed-courses are listed below:

- PhD on the ecology and conservation of the threatened large-eared pied bat (*Chalinolobus dwyeri*) and eastern cave bat (*Vespadelus troughtoni*) – Macquarie University (in progress).
- Anabat Insight Advanced Workshop – Titley Scientific.
- Kaleidoscope Pro Advanced Training – Wildlife Acoustics.
- Worked as a Fauna Ecologist within the NSW Biodiversity Offset Scheme since 2019.
- Bachelor of Environmental Science and Management HONOURS (1st Class) – University of Newcastle.

Lachlan has gone on to have multiple one-on-one trainings with Dave Roberts from Wildlife Acoustics, Julie Dawson (formerly Broken-Brow) from Titley Scientific, and Brad Law from NSW DPI to further validate his analysis skills and discuss advanced concepts beyond the scope of the above courses. Lachlan also keeps in regular communication with recognised bat experts such as Brad Law, Chris Corben, Greg Ford and Michael Pennay to ensure he remains at the forefront of the latest techniques and knowledge to identify bat calls.

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